Investigations of the Syntax–Semantics–Pragmatics Interface

Edited by
Robert D. Van Valin, Jr

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PART 1

Introduction by the Editor

Editor's introduction

There is much work devoted to issues concerning the syntax-semantics interface in a variety of theoretical frameworks in contemporary linguistics (see Levin & Rappaport Hovav 2005 for an overview of work on lexical representation and argument structure). Much less work, however, deals with the interaction of pragmatics with syntax and semantics; investigations of information structure delve into the syntax-pragmatics interface (see Erteschik-Shir 2007 for an overview), while approaches like Discourse Representation Theory (Kamp & Reyle 1993; von Heusinger 1999) are concerned with the pragmatics-semantics interface. These are not three isolated interfaces, however; rather, they are aspects of the syntax–semantics–pragmatics interface, which is the object of inquiry in Role and Reference Grammar [RRG] (Van Valin & LaPolla 1997; Van Valin 2005). RRG is a linking theory with a direct mapping between semantic and syntactic representations, unmediated by any kind of abstract syntactic representation, and discourse-pragmatics plays a role in this linking as well. The basic organization of RRG, which is a model of the syntax–semantics–pragmatics interface, is given in Figure 1.

SYNTACTIC REPRESENTATION

↑

Linking
Algorithm   Discourse-Pragmatics

↓

SEMANTIC REPRESENTATION
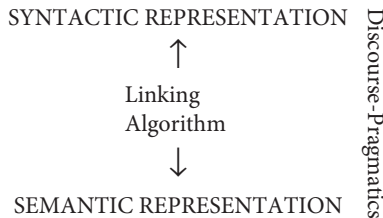
Figure 1. The organization of Role and Reference Grammar.

As a parallel architecture theory (Jackendoff 2002), RRG assigns each of these aspects of the linguistic system its own representation and investigates the interaction among them both within languages and across languages. Many phenomena which are treated as purely syntactic in many generative approaches are treated here in semantic terms, e.g., reflexivization, or in terms of the interaction of syntax and pragmatics, e.g., extraction constraints ("subjacency").

The papers in this volume exemplify well the multifaceted RRG approach to linguistic analysis and explanation. They represent a selection of the papers presented at the Role and Reference Grammar Conference at the University of Leipzig in September, 2006.[1] They are divided into five sections, covering the major areas of

analysis in RRG as well as neurolinguistic and computational aspects of the theory. Each will be discussed below.

1.   Verbs, argument structure and transitivity

There is considerable debate in the literature about the nature of the semantic representation of verbs and other predicating elements. The basic distinction is between projectionist theories, such as RRG and Rappaport Hovav & Levin (1998), in which the syntactic structure of sentences is projected from rich semantic representations of predicates, and constructionist theories, such as Goldberg (1995) and Pustejovsky (1995), in which minimal or underspecified representations for verb semantics are posited, with the exact meaning being determined by the syntactic environment in which the verb occurs. As argued in Van Valin (2008), this contrast is more apparent than real; each perspective on meaning can be seen to reflect one of the two directions of linking in RRG, from semantics to syntax (projectionist) and from syntax to semantics (constructionist); see Figure 1. The papers in this section all reflect the projectionist or semantics-to-syntax-linking perspective. There are two interwoven themes; the first concerns the semantic representation of verbs and their arguments, and the second is about transitivity and linking.

Two of the contributions concern lexical representation of verbs. The first paper is Sergio Ibañez's contribution "'Saying' verbs in Spanish: Deepening the lexical semantic description". Most of the theories of lexical decomposition discussed in Levin & Rappaport Hovav (2005), including that in Van Valin & LaPolla (1997), involve shallow decomposition. Earlier attempts at a deeper, richer decomposition can be found in Van Valin & Wilkins (1993) and Mairal & Faber (2002); in Van Valin & LaPolla there is some discussion of a more detailed decomposition of verbs of saying. This is the starting point for Ibañez's paper, in which he discusses many semantic properties of verbs of saying in Spanish and proposes a richer decomposition for this class of verbs.

The issue of split-intransitivity (so-called "unaccusativity") has figured prominently in discussion of the syntax-semantics interface for the past two decades (e.g., Perlmutter 1978; Van Valin 1990; Kishimoto 1996), and Kiyoko Toratani's paper "Split intransitivity in Japanese revisited" critically examines other accounts of split intransitivity in Japanese and argues that while the basic distinction follows the *Aktionsart* analysis proposed in Van Valin (1990), other accounts are undermined by a failure to make certain crucial distinctions in the syntactic constructions which underpin them.

The remaining papers concern transitivity and its implications for the linking from semantics to syntax in RRG. The transitional paper between lexical representation and linking is Hiroaki Koga and Toshio Ohori's contribution "Reintroducing inverse constructions in Japanese". Inverse constructions are typically thought of as a feature of Algonquian languages, but Koga and Ohori show serializing verbs meaning "come"

and "go" with a variety of Japanese verbs yields semantic and grammatical effects similar to those found in inverse constructions in other languages. They explore the syntactic, semantic and information-structural properties of this construction, thus exemplifying well the RRG approach to the syntax–semantics–pragmatics interface.

The other three papers in the section address issues concerning transitivity and linking. RRG has a rather different definition of transitivity from other theories: instead of the distinction revolving around how many direct NPs cooccur in a clause, it is defined in terms of the number of semantic macroroles a verb or other predicator takes. This is termed M-transitivity and is the notion of transitivity most relevant to the linking system. RRG rigorously distinguishes between valence (the number of arguments a verb or other predicator takes) and M-transitivity. Kabardian, a double-marking, morphologically split-ergative language spoken in the Caucasus, presents a complex system of transitivity alternations and person-marking prefixes. Ranko Matasović's paper "Transitivity in Kabardian" shows how the RRG system of lexical representation, notion of M-transitivity, and agreement rules interact to yield a clear picture of what appears *prima facia* to be a rather impenetrable system. The last two papers in this section investigate some of transitivity alternations which are much discussed in the literature (see Levin (1993) for an overview). Martin Haspelmath explores the analysis of "Ditransitive constructions in RRG and some other approaches". Other approaches treat ditransitive constructions in purely syntactic terms, e.g., the VP-shells approach originally proposed in Larson (1988), or in terms of mapping between thematic relations and grammatical relations, e.g., Lexical-Functional Grammar (Bresnan & Moshi 1990). RRG, on the other hand, treats alternations with three-place verbs as involving variable undergoer selection, with consequences for the linking from semantics to syntax. Wataru Nakamura, in his paper "Variable transitivity: A challenge to linking theory" tooks at a different set of transitivity alternations, those involving coding the affectedness of one of the object arguments, and proposes a novel account within RRG. He argues that the RRG account is superior to the proto-role-based analysis of Ackerman & Moore (2001). All of these papers deal with issues at the forefront of work on argument structure and the syntax-semantics interface.

2.   Syntactic and morphological categories

The next group of papers addresses topics which range from the outlines of an analysis of Old English morphology in RRG to questions of clause structure in German and Spanish; they concern the syntactic representation in Figure 1. While morphology has been an important topic in generative syntactic theories, it has received much less attention in RRG. Javier Martin Arista, in his contribution "Unification and separation in a functional theory of morphology", develops some ideas originally proposed in Everett (2002) and applies them to the analysis of Old English and argues that the same kind of principles that drive syntax and semantics are involved in morphology,

e.g., the RRG notion of the layered structure of the clause can be adapted to give a layered structure of the word.

An important aspect of the projection grammar representation of the layered structure of the clause is the division of the clause into constituent and operator projections. Originally proposed in Johnson (1987), this system of representation was the first since Fillmore (1968) to represent predicates and arguments differently from operators (functional categories). Similar ideas were later adopted in principles and parameters approaches in terms of higher functional projections. Brian Nolan's paper "Modality in RRG: Towards a characterization using Irish data" explores an important concept, modality, which covers two different but related operators in RRG: "modality", which is deontic or root modality, and "status", which includes epistemic modality. He proposes modal-logic-based analysis of the semantic properties of the two types of modals, which would be part of the semantic representation of clauses containing modal operators.

Two fundamental questions that all theories must answer concern the lexical and syntactic categories which are found in the constituent projection of the clause: how should lexical categories be characterized, and how are they projected into syntax? There has been much discussion of the first question in the functionalist literature, e.g., Hopper & Thompson (1984), and both have been of concern in the generative literature, e.g., Chomsky (1970); Baker (2003). In "RPs and the nature of lexical and syntactic categories in Role and Reference Grammar", I give possible RRG answers to these questions. It is argued that noun and verb are the only two universal lexical categories, as they follow from the basic linguistic functions of reference and predication; this analysis is not unique to RRG. It is further argued that the primary phrasal categories in the syntax are not projections of lexical heads and therefore are non-endocentric. This is a radically different view of phrase structure from generative theories, all of which assume endocentric phrase structure. This proposal has implications for the much-discussed problem of the gradience of lexical categories.

RRG addressed some of the issues raised by head-marking language in some of the earliest work in the theory (Van Valin 1977), and in Van Valin (1993b) a structural representation for head-marking languages was proposed; in it, the bound pronominal markers count as the core arguments, not independent NPs cross-referenced by them. An interesting and potentially problematic intermediate case between purely dependent-marking languages and purely head-marking languages is raised by languages which are basically dependent marking but in which independent NPs may be "doubled" by clitics, e.g., Romance languages. There is a large literature on the analysis analysis of clitics in generative grammar, e.g., Zwicky & Pullum (1983); Borer (1986); Manzini & Savoia (2004). A solution for the problem of unusual plural marking with accusative and dative clitics in some dialects of Spanish was proposed in Belloro (2004), and Rolf Kailuweit proposes an alternative, optimality-theoretic analysis of this phenomenon in his contribution "Floating plurals, pro-drop and agreement:

An optimality-based RRG approach". Unlike Belloro's approach, he applies the RRG head-marking analysis, along with the layered structure of the NP, in his solution. His paper illustrates the value of the combination of RRG principles with constraint ranking from optimality theory.

German presents a number of challenges for theories of clause structure, and traditional German linguists have developed a "topological" analysis of the German clause, one which is different in many respects from the kind of analyses proposed in the generative literature. Elke Diedrichsen's paper "Where is the precore slot? Mapping the layered structure of the clause and German sentence topology" shows how these two conceptions of German clause structure map onto each other in a surprisingly natural way. One consequence of this analysis is that German is revealed to be unusual in that all main clauses contain a precore slot, which corresponds to the traditional *Vorfeld* of the clause.

3.   Syntax, pragmatics and prosody

As shown in Figure 1, discourse-pragmatics plays a role in the linking between syntax and semantics, and the papers in this section concern themselves with this interaction. In addition to the syntactic representation (based on the layered structure of the clause) and the semantic representation based on the lexical decompositional representation (logical structure) of the verb, there is also a projection representing the information structure of the clause, indicating the actual focus domain (what is actually in focus in a given context) and the potential focus domain (the part of the clause which can potentially be the actual focus domain), among other distinctions. A very significant indicator of the information structure of a clause is intonation, and heretofore there has been no indication of intonation in the RRG representations. Robert O'Connor's contribution "A prosodic projection for Role and Reference Grammar" develops a representation of intonation based on the Autosegmental-Metrical/Tones and Break Indices system of representing intonation. The proposed prosodic projection is closely tied to the information structure representation, and it fills an important gap in the RRG representational system. Intonation is represented in written language in part by means of punctuation, and Valeriano Bellosta von Colbe raises the question "Is Role and Reference Grammar an adequate grammatical theory for punctuation?" in his paper and answers it affirmatively with respect to Spanish punctuation. The issues addressed in this paper parallel those in O'Connor's paper, and the two together show how the RRG model of the interface in Figure 1 provides a productive framework for the analysis of intonation and intonation-related phenomena.

The next two contributions concern the interaction of discourse-pragmatics with semantics and with syntax. Delia Bentley's paper "The interplay of focus structure and syntax: evidence from two sister languages" addresses two issues. The first is the typology of the interaction of focus structure and syntax proposed in Van Valin (1999),

which looks at the flexibility of focus structure in terms of possible focus positions in the clause and the flexibility of word order. Italian, following Lambrecht (1994), is analyzed as having rigid focus structure and flexible syntax, and Bentley shows that Sicilian falls into a different category, namely the one of flexible focus structure and flexible word order, a somewhat surprising grammatical difference between two such closely related languages. The second issue concerns Rizzi's (1997) claims regarding the structure of the left periphery in Italian. He argues for a complex structure which includes a focus position higher than a topic position, a curious structure from an information-structure perspective. Bentley gives an RRG account of these phenomena which accounts for the data in a straightforward way and avoids positing such an unusual structure. In the second paper a challenging ellipsis phenomenon in Japanese is investigated. Japanese is well known for its extensive discourse-driven ellipsis of arguments, but it is also possible in certain constructions to omit the verb, yielding a construction with an accusative object but no verb to assign accusative case. Mitsuaki Shimojo tackles this construction in his paper "How missing is the verb? The verb-less numeral quantifier construction in Japanese". In order to account for the case marking and for the interpretation of the missing verb, he makes use of the discourse representation structures derived from Discourse Representation Theory (Kamp & Reyle 1993; von Heusinger 1999), which were adapted into the RRG theory of information structure in Van Valin (2005); in that discussion the goal was the recovery of discourse referents in languages like Mandarin with extensive argument ellipsis. Shimojo extends the system to permit the recovery of predicates from the discourse context and provides an elegant solution to the problem posed by these constructions.

The final paper in this section is "Predication and reference in specificational sentences – functions of noun phrases" by Emma Pavey. It investigates the interpretation and coding of referents in English noun phrases, with an eye to the problems raised by specificational predications, e.g., *Bill is the loser*. Building on Lambrecht's (1994) notion of a pragmatic predicate, Pavey provides an RRG analysis of sentences containing specificational predications.

4.   The analysis of complex sentences

RRG has a rich theory of the syntax–semantics–pragmatics interface in complex sentences, and the four papers in this section address different aspects of it. The units and operators of the layered structure of the clause are crucial components of the theory of complex sentences, and they interact with the interclausal semantic relations hierarchy to provide explanatory accounts of a range of complex sentence phenomena, including complement selection (see e.g., Van Valin & Wilkins 1993). The first two papers concentrate on volition ("want") and propositional attitude ("believe") complements in a range of languages. In "Alternative expressions of "want" complements" Lilián Guerrero focuses on these constructions in Uto-Aztecan languages, exploring

those instances in which alternative codings are possible and analyzing the syntactic and semantic implications of the different possibilities. She then provides an explanation for these effects in terms of the RRG interclausal relations hierarchy. Takahiro Morita investigates these complements in French in "An RRG approach to French complementation patterns: Some operator constraints on the logical structure". He shows how constraints on possible operators (e.g., tense, negation) in the logical structure of complex sentences can predict the correct complementation patterns with verbs of volition and propositional attitude.

What is often referred to as the "*that*-trace effect" has been much discussed in the syntax literature for decades, and in Van Valin & LaPolla (1997) and Van Valin (1998, 2005) an RRG account for this effect has been proposed, one which refers crucially to the interaction between information structure and syntax in complementation. John Lowenadler, in his contribution "Complementizer-gap phenomena: Syntactic or pragmatic constraints?", challenges this information-structure-based account and proposes an alternative RRG account based on constraints on possible syntactic templates available in the syntactic inventory of a language, based primarily on data from Swedish and a range of languages.

The final paper in this section relates to the earlier paper on syntactic categories and endocentrism. In "Wari' intentional state constructions" Daniel Everett examines a class of unusual complementation constructions in Wari', an Amazonian language. They all involve the expression of intentional states, as the name implies, but they all lack complement-taking predicates, i.e., verbs; where the verb would normally be in a Wari' clause (it is VOS), one finds the complement clause itself, i.e., [[$_{CLAUSE}$ …] (O) S]. The proper description of these structures is a challenge for every theory of syntax, and Everett gives an RRG analysis which insightfully captures the phenomena but requires no modification of the theory of complex sentences. In this paper and the one on RPs the fundamental differences between traditional endocentric phrase structure and RRG's non-endocentric approach to phrase structure are made very clear, and the data in both papers strongly support the RRG approach.

5.   Neurolinguistic and computational aspects of RRG

The final group of papers concern themselves with "applied RRG", that is, applying RRG to neurocognitive sentence processing, on the one hand, and to computational text analysis and parsing, on the other. In Figure 1 the arrows of the linking algorithm are double-headed, which means that the linking rules map a semantic representation into the appropriate syntactic representation as well as a syntactic representation into the appropriate semantic representation. In other words, the system does what speakers do (map from semantics to syntax) and what hearers do (map from syntax to semantics), and therefore it is relevant to the concerns of neurocognitive language processing models. Van Valin (2006) shows how the semantics-to-syntax linking

algorithm parallels in striking detail the grammatical encoding component of Bock & Levelt's (1994) production model, and moreover how the syntax-to-semantics linking algorithm could fit into language comprehension models. Bornkessel & Schlesewsky (2006a,b) incorporate aspects of RRG into their extended Argument Dependency Model, a neurocognitive model of sentence processing, and in their contribution to this volume, "Unmarked transitivity: A processing constraint on linking", they investigate the role that expectations about transitivity play in language comprehension, and relate their findings to both the RRG approach to transitivity, which is also a topic in several of the papers in the first section, as well as to the architecture of the theory.

The final two papers address different computational implementations relevant to RRG. The first, "Parsing for Role and Reference Grammar" by Elizabeth Guest, develops a parser based on RRG which can parse a selection of sentences from English and Dyirbal, including Dyirbal sentences with discontinuous constituents. This parser exploits two significant features of RRG: first, that syntactic structure is represented in terms of templates instead of rules, and second, that grammatical categories (operators) are represented differently from predicates, arguments, and adjuncts. The second, Nicolai Winther-Nielsen's "A Role-Lexical Module (RLM) for Biblical Hebrew: A mapping tool for RRG and WordNet", presents a computational tool for doing decompositional semantic analysis of verbs in a text and organizing the results in an on-line lexical database, using Biblical Hebrew as the test language. Some of the issues addressed in this paper tie in with those investigated in papers about argument structure and lexical decomposition in the initial section of the book.

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Verbs, argument structure and transitivity

"Saying" verbs in Spanish

Deepening the lexical semantics description

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The aim of this work is to provide a fine-grained semantic description of "saying" verbs in Spanish to try to determine the specific semantic features that permit these verbs to project their argument structure in an ample set of alternative syntactic constructions. The work provides a characterization of this verbal domain in specifc semantic sub-domains through the notion of frame semantics. It is argued that the relevant frame for the description of these verbs's meaning is Jakobson's model of communicative functions. It's claim that these functions play an important role in defining the semantics of the different sub-domains and that they permit the identification of the features that are behind the different constructional patterns of these verbs.

1. Introduction

Van Valin & LaPolla (1997: 116–118) propose that the verbs of "saying" constitute a special class of activity verbs, in as much as they behave syntactically in a complex manner. Concretely, the items that belong to this verb class can project clauses with different patterns of complementation. As an example they show the case of the verb *to speak*:

(1) a. *Sandy spoke but a few words.*
     b. *Sandy spoke to Kim.*
     c. *Sandy spoke Telugu.*

In order to avoid positing one different lexical entry for each of the predicates in these examples, Van Valin & LaPolla (1997: 117) make use of a common representation, valid for all the verbs of "saying", which along with the syntactic variables, adds a set of internal variables that refer to the semantic elements that can have an alternative syntactic projection with this kind of predicates. The representation is the following:

(2) **do′** (x, [**express(α).to.(β).in language.(γ)′** (x,y)])

Resorting to this kind of syntactic and semantically driven templates has been systematically exploited in the research program of the Lexical Functional Grammar (Faber & Mairal 1999) and within the Lexical Grammar Model (Mairal & Faber 2002 and 2005; González 2002 and 2004). The basic idea behind this is to capture and formalize the description of the complete interplay between semantics and syntax.

The goal of this paper is to present a more fine-grained semantic analysis of the verbs of "saying", or "communication" verbs, in Spanish. The aim is, in the spirit of Lexical Grammar, to deepen Van Valin & Lapolla's semantic characterization of this verbal class, in order to determine the particular features that are behind the different possibilities of each verb of the class to project one or another of their syntactic arguments, and the features that are behind the different coding properties of these arguments.

The semantic analysis I present here takes in consideration that the whole domain of "saying" verbs functions as a semantic frame (Fillmore 1982). I argue that the frame is organized in the same vein of the communication model first proposed by Jakobson (1988) in 1956, which considers, not only the elements participating in the communication process (the speaker, the addressee, the message, the referent, etc.), but also the dynamic relations that these elements display among them; these relations are the so called communication functions (emotive, referential, connative, etc.). The claim is that the semantic and syntactic identity of the verbs can be predicted considering the values they lexicalize from this frame.

2.   Some problems on the current approach

As has been said, Van Valin & Lapolla (1997) propose a generic logical structure for all the verbs of saying. It is repeated here as number (3):

(3)   **do′** (x, [**express(α).to.(β).in language.(γ)′** (x,y)])

As one can see, along the syntactic variables x and y, this representation has a set of semantic or internal variables, the ones in Greek letters. These variables are behind the different patterns of complementation of a verb like *to speak* that, as we have seen, can select as direct core argument the thing expressed, or the addressee, or the language spoken by the speaker.

Van Valin & Lapolla also propose that there is another kind of verbs of saying; these are the ones of the type of *to tell*, which are said to have the following logical structure:

(4)   **do′** (x, [**express(α).to.(β).in language.(γ)′** (x,y)]) CAUSE
        [BECOME **aware.of′** (y,z)], where y = β, z = α

The representation in (4) accounts for the double fact that verbs as *to tell* are inherently *telic* and involve a causative value. This last feature is revealed by the paraphrase: *Sandy told Kim that Robin would arrive soon* = "Sandy's speaking made Kim become aware that Robin would arrive soon".

Although these two representations – (3) and (4) – account for a lot of semantic and syntactic phenomena within the domain of the verbs of "saying", they are not strong enough for covering certain facts, as the following ones:

1.   In the first place, one has to explain how is it that certain predicates that are canonically activities, as *gritar* "to shout", can project the logical structure reserved for the items like *to tell*, as it is shown in the following Spanish example:

(5)   *Juan se puso a llorar cuando María le   gritó   que lo   dejaba.*
      John started to cry   when   Mary DAT shouted that him leave.PASS.IMPF
      'John started to cry when Mary shouted at him that she was leaving him.'

In this example, the verb *gritar* appears with three syntactic arguments, rather than two, as it is expected for the activity verbs. These arguments are the speaker – *María* –, the addressee – the pronominal clitic *le*, which has *John* as referent – and the content of the utterance – *that she was leaving him* –. Furthermore, it is clear that what has been expressed by María by means of her shouting has caused John to be aware of some information that in turn causes his crying.

From these two characteristics, the appearance of three syntactic arguments and the causative value, we can say that the example in (5) is a projection of the lexical template in (4), rather than the one for the activity verbs. It is true that the analyzed clause seems not to have an internal duration (*i.e.*, *atelic*), for it can not be modified by a PP introduced by the preposition *en* "in", and in this sense, it seems not to correlate to the accomplishment semantic class. But this is an effect of the content of what "María" has expressed, which is very short in time. This point is clear when we see an example like the one in (6):

(6)   *Pedro se apenó cuando María le   gritó   en la   cara, en menos de*
      Peter ashamed when   Mary DAT shouted in the face, in less   than

      cinco minutos, todos   sus   reclamos   del   año.[1]
      five   minutes, all   her   complaints of.the year

      'Peter felt ashamed when Mary shouted at him, in less than five minutes, her complaints for the whole year.'

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1.   It is true that the event denoted by this clause can be thought as a succession of different sub-events of shouting that express the different portions of the content, but it's also true that from the conceptual point of view of the speaker, this situation can be seen just as one gestaltic-holistic event.

So then, how to explain the fact that verbs like *gritar* can project two different kinds of logical structures. As I will suggest later, it is possible to use just one representation that accounts for both uses of *gritar* and for all kinds of saying verbs.

2.   A second problem that arises from the common semantic characterization in the templates of (3) and (4) is that they don't take in consideration the "referent" of the communication as an independent semantic feature. As Goddard and Wierzbicka (2002: 2) claim in the context of the natural semantic metalanguage (NSM), the following syntactic template seems to be universal:

(7)   *John talked to Pat **about Sandy**.*

Van Valin & LaPolla (1997: 668) claim that the complement in bolds is an optional realization of the "content" variable. Nevertheless, this variable – the content – can be projected in a sentence which simultaneously have a complement like *about Sandy*:

(8)   *John said ugly things about Sandy.*

The question here is which one of the two complements *ugly things* or *about Sandy* is the projection of the so called content variable. It seems it would be *ugly things*. If it is so, then which semantic variable is projecting *about Sandy*? My proposal here, is that the content can be splited into two different variables, namely, "commentary" and "referent". Following this, we can say that *ugly things* is the commentary and that *about Sandy* is the referent.[2]

In Spanish, as also happens in certain verb types in English and in other languages, the semantic and syntactic requirement of the referent is strong. As we will see below, a broad class of verbs is semantically defined by it. Besides, the referent can be projected into the syntax as direct obejct, as with *discutir* "to discuss", *reprochar* "to reproach", *criticar* "to criticize", etcetera, and when this is not the case, it is coded by means of a PP introduced by the preposition *de*, which is the canonical one used for introducing oblique core arguments with the so called, in the Hispanic linguistic tradition, "prepositional verbs" or "verbs that govern preposition". See the examples in (9):

(9)   a.   *Juan   carece   **de**   oportunidades.*
             John   lacks   of/from   opportunities
             'John lacks opportunities.'

       b.   *Juan se ocupó **del**   asunto.*
             John   took   of.the   business
             'John took the business in his hands.'

---

2.   When both referent and commentary appear together as different syntactic complements, as in (8), it is always the case that the commentary is projected as direct object and the referent is coded as a prepositional complement. Most of saying verbs can also appear with the commentary and the referent unified in a single complement – *John said that Peter* (the referent) *is a fool* (commentary) –, and that's what can be called the content.

These facts, then, point out the need of the consideration of one more semantic and syntactic variable in the lexical representation of the verbs of saying.

3.   Another possible question about templates (3) and (4) is, if the consideration of the internal variable "language" is enough to cover the following data:

(10)   a.   *Juan dijo a   María lo que sentía **con** la   mirada/ **con**   gestos/*
             John told DAT Mary what felt   with the glance/ with   gestures/

             ***con** su proximidad/ **con** un ademán.*
             with his proximity/   with a   gesture

             'John told Mary what he felt with a glance/with gesticulation/with his proximity/with a gesture.'

       b.   *Juan le   dijo a   María lo que sentía **en** italiano.*
             John DAT told to Mary what   felt   in Italian
             'John told Mary what he felt in Italian.'

       c.   ??*Juan dijo a María lo   que sentía **en** la mirada/ **en** gestos/   **en** su*
             John told to Mary what felt in   the glance/ in gestures/ in his

             *proximidad/ **en** un ademán.*
             proximity/ in a   gesture

             'John told Mary what he felt in a glance/in gestures/in his proximity/in gesticulation.'

       d.   ??*Juan le   dijo a   María lo que sentía **con** el   italiano.*
             John DAT told to Mary what   felt   with the Italian
             'John told Mary what he felt with the Italian.'

The case in question with these examples is if this different behavior – the use of different prepositions in (10a) vs. (10c) and in (10b) vs. (10d) – accounts for the differentiation of two semantic categories, namely, "code" on one side – (10a) –, and "language" on the other side – (10b) –. Both are inherent semantic variables and they are not peripheral adjunts as can be seen from the fact that the same participant they code in the above sentences can be encoded as direct core arguments in sentences like the following:[3]

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3.   In stablishing the semantic and syntactic status of the "code" variable, I'm following the same criteria that is usually aplied to the recognition of the instruments of verbs like *to cut*. Code is a kind of argument that can appear as subject only with verbs of saying. In fact, the constructions with the code as subject are very common, at least in Spanish. Despite the fact that it can be optional information, it is not in the same level of optionality as real peripheral informtation is. I'm assuming here a general working principle (Ibáñez 2004): the hypothesis that, leaving aside voice phenomena, only the participants that are inherent part of the lexical representation of one item can be coded, in the different constructional patterns of that item (its diathesis), as a direct core argment – i.e., subject and direct object –. More precisely, the hypothesis is that if a participant that is usually coded as a PP can appear as a direct core argument, then it is an inherent part of the LS of the predicate in turn, and it isn't, when is coded as a PP, a peripheral complement.

(11) a. *Una mirada/el gesto   se   lo   dijo todo.*   code = subject
          A   glance/the gesture DAT ACC said all
          'A glance/the gesture said it all to her.'

      b. *Juan   habla   italiano   muy bien.*   language = direct obejct
          John   speaks Italian   very well
          'John speaks Italian very well.'

However, It is meaningful that just the code can appear as the subject of the clause. This is because code and language have different semantic and syntactic identity:

(12) a. *Una mirada /el   gesto   le   dijo todo.*
          A   glance /the gesture DAT said all
          'A glance/the gesture said it all to her.'

      b. **El   italiano /la   clave   morse/la   lengua de señas le   dijo todo.*
          The Italian   /the key   morse/the language signs DAT said all
          'The Italian/the key morse/the sign language said it all to her.'

4. One more problem of the current characterization of the domain through the templates in (3) and (4) is that they don't have the information that allows us to predict which verbs codify the addressee as direct object, as an indirect object or as an oblique complement introduced by the preposition *con* "with", as the cases in (13) exemplify:

(13) a. *Juan informó   a   María* de la noticia. addressee = direct object
          John informed ACC Mary of the news
          'John informed Mary about the news.'

      b. *Juan le   dijo la   noticia a   María.* addressee = indirect object
          John DAT said the news   to Mary
          'John said the news to Mary.'

      c. *Juan platicó con María de Pedro.*   addressee = oblique complement
          John talked with Mary of Peter
          'John talked with Mary about Peter.'

Below, we propose that these different coding patterns arise from semantic values that define different sub-domains and that have to be postulated as semantic constants in the lexical representation. These values refer to the particular relations that the semantic participants (*e.g.*, speaker, addressee, content, etc.) maintain among them. These are the communication functions of Jakobson.

5. One last issue to take into consideration is the fact that some predicates can code the same semantic argument in different syntactic functions – direct object and indirect object –, but other verbs belonging to the same sub-domain can not, as it is shown in the examples in (14):

(14)   a.   *María   le   recriminó   a Juan   su   falta   de cortesía.*
             Mary   DAT   recriminated   to John   his   lack   of politeness
             'Mary recriminated his lack of politeness to John.'

       b.   *María   recriminó   a   Juan por   su   falta   de cortesía.*
             Mary   recriminated   ACC John for   his   lack   of politeness
             'Mary recriminated John for his lack of politeness.'

       c.   *María   le   reprochó   a Juan   su   falta   de cortesía.*
             Mary   DAT   reproached   to John   his   lack   of politeness
             'Mary reproached his lack of politeness to John.'

       d.   **María   reprochó   a   Juan   por   su   falta   de cortesía.*
             Mary   reproached   ACC John   for   his   lack   of politeness
             'Mary reproached John for his lack of politeness.'

       e.   *María reprendió a   Juan por   su   falta   de cortesía.*
             Mary scolded   ACC John for   his   lack   of politeness
             'Mary scolded John for his lack of politeness.'

       f.   **María   le   reprendió a Juan   su   falta   de cortesía.*
             Mary   DAT   scolded   to John   his   lack   of politeness
             'Mary scolded his lack of politeness to John.'

The possibility or not of the alternation is ruled, it seems, by more particular semantic features than the ones that are stipulated in the templates of (3) and (4). So one has to go deep into the semantic analysis to find them.

3.   The semantic frame in the lexical description of saying verbs

What I want to propose here is that the semantic domain of the verbs of "saying" functions as a frame in Fillmore's sense (1982). That is, the basic idea is that the architecture of a domain is not solely organized in terms of paradigmatic and hierarchical relations among the items in the domain (Mairal & Faber 2002), but in terms of the relation that these itmes hold to a more elastic and operational structure, charged with a broader range of features, that accounts for all the particular meaning features of each of the predicates in the domain in turn; that is, a frame. A frame can be seen as a cognitive schema that underlies the linguistic information and that has the relevant features for the construal and interpretation of scenes inside a context situation. This kind of structure permits that the items of a semantic domain that have more particular features and less range of meaning can naturally "recover" features that are not basic to their meaning but conform the nuclear content of items of the same domain with more general meaning. This is the case of a verb like *gritar* "to shout" that canonically is used as an intransitive activity predicate which focuses in its meaning the manner on which

the vocal sounds are articulated, but can also instantiate a structure that activates a complete communication scene, as in the examples (5) and (6) above.

The particular meaning of each one of the items in the domain is a part of the frame. The frame, in turn, has the complete set of features that are relevant for each of its pieces. The image that results from this is the one of a puzzle where each piece has at the same time a charge of particular information along the complete information of the schema. In this configuration one term activates the whole information of the domain, but focuses on one or two or several points in it, as in a network.

In this context, I propose that the relevant frame for using the verbs of saying is, at least as a departure point, the schema proposed by Jakobson (1988) as a communication model. This model was designed to cover the basic universal properties of a communicative situation:

	Code	
Speaker Medium	----------- Message -----------	Addressee Feedback
	Referent	
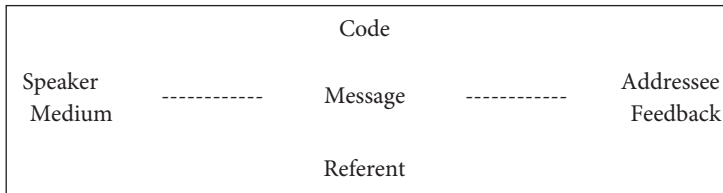
Figure 1. Jakobson's communication model.

The simplified schema in figure 1 adds three more participants or semantic formants to the ones already postulated in the templates of (3) and (4): these are the referent, the code and the feedback. I have already intended to show some applications of the notion of code as differentiated from language. Below I show that both the referent and the feedback are features that define verbal sub-domains.

See in the example in (15) how a Spanish sentence can give place to the projection of all of the semantic variables in the frame:

(15) *Con palabras sórdidas Juan le   dijo a María   mentiras de   Pedro.*[4]
      With words   sordid   John DAT said to Mary   lies   of   Peter
      'With sordid words John told Mary lies about Peter.'

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4.   Despite the fact that it seems a kind of genitive complement that modifies the direct object NP, the PP *de Pedro* is an argument of the verb. There are a lot of tests that allow us to consider it so. As an example see the difference between the sentences in (a)–(b) and (c):

(1)   a.   *Juan vio el   reloj **de Pedro.***   (PP internal to the DO)
           John saw the watch of Peter
           'John saw Peter's watch.'

      a′. *****De Pedro** Juan vio el   reloj.*
           Of Peter   John saw the   watch
           'Of Peter John saw the watch.'

In this structure we can see the appearance of the speaker, the addressee, the commentary, the referent and the code. We need, then, a representation that stipulates all these variables not just as internal ones, but also as syntactic ones, because these semantic values are not just optional possibilities of the same argument; they can be arguments in their own right with a projection option of their own. In (16) it is presented a proposal of a generic maximal-template for saying verbs, that is isomorphic with Jakobson's model:

(16)   [**do′** (x, [**use.code′** (x, y)]) ∧ **do′** (x, [**refer.to′** (x,u)]) ∧
       do′ (x, [**express.(α).to.(β).in.language.(γ)′** (x, w)])] CAUSE
       [BECOME **aware.of′** (z, w)], where z = β, w = α

This structure can be interpreted as follows: an effector or speaker (x) uses a code (y) to refer to a referent (u) and express a commentary (w) causing that an addressee (z) becomes aware of the comentary (w) about (u).

    Using this template a sentence like (15) would have this representation:

(17)   [**do′** (Juan, [**use.code′** (Juan, palabras)]) ∧ **do′** (Juan, [**refer.to′** (Juan, Pedro)]) ∧
       do′ (Juan, [**express.(α).to.(β).in.language.(γ)′** (Juan, mentiras)])] CAUSE
       [BECOME **aware.of′** (María, mentiras)]

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a″. **Juan   lo   vio   **de** **Pedro.**
     John   ACC   saw   of   Peter
     'John saw it of Peter.'

b.   *Juan rompió   el   jarrón   **de vidrio**.   (PP internal to the DO)
     John broke   the   vase   of glass
     'John broke the vase of glass.'

b′. **De   vidrio   Juan   rompió   el   jarrón.*
     Of   glass   John   broke   the   vase
     'Of glass John broke the vase.'

b″. **Juan   lo   rompió   **de vidrio**.*
     John   ACC   broke   of glass
     'John broke it of glass.'

c.   *Juan   dijo   una   mentira   **de Pedro**.*   (PP argument of the verb)
     John   said   a   lie   of Peter
     'John said a lie about Peter.'

c′. ***De Pedro**   Juan   dijo   una   mentira.*
     Of Peter   John   said   a   lie
     'About Peter John said a lie.'

c″. *Juan   la   dijo   de   Pedro.*
     John   ACC   said   of   Peter
     'John said it about Peter.'

With this general structure in mind, In the rest of this work I will try to present other different semantic features that arise from the use of Jakobson's communication model, and I will try to show the use of these values in defining lexical sub-domains.

Beyond its apparent formants – addressee, speaker, referent, etc. –, what is really interesting about this model is that it is based on the consideration of the relations among these formants. These relations are what Jakobson calls the communication functions. These are the following:

a.   The referential function: is the relation between the message and the referent.
b.   The emotive function: is the relation between the speaker and the message.
c.   The connative function: is the relation between the addressee and the message.
d.   The poetic function: is the relation of the message with itself.
e.   The metalinguistic function: is the relation between the code and the message.
f.   The factive function: is the relation between the speaker and the addressee.

Each of these functions conform the semantic features that are basic in characterizing semantically and syntactically particular sub-domains. As a very preliminary and partial proposal for the semantic architecture of the domain, we identify seven big sub-domains defined by Jakobson's functions, and some of their possible sub-domains:

1.   Generic communication verbs. (X said something to Y): *comunicar* "to communicate", *decir* "to say", *expresar* "to express", *hablar* "to speak", *mencionar* "to mention", *referir* "to refer".
2.   Emotive Verbs. (X said to Y "I think this about Z").
    2.1   Verbs of 'expressing a commentary/opinion'. (X said to Y 'I think this about Z'): *opinar* "to express an opinion", *argüir* "to argue", *declarar* "to declare, to state", *postular* "to postulate", *argumentar* "to argue".
    2.2   Verbs of 'expressing praise or recognition to the addressee'. (X said to Y 'I think you did something good, I want you to feel good because of this): *felicitar* "to congratulate", *congratular* "to congratulate", *reconocer* "to acknowledge", *elogiar* "to praise", *alabar* "to praise", *aclamar* "to acclaim".
    2.3   Verbs of 'expressing disapproval to the addressee' (X said to Y 'I think you did something bad, I want you to feel bad because of this'): *reprochar* "to reproach", *recriminar* "to recriminate", *censurar* "to censor", *reprobar* "to reprove", *criticar* "to criticize".
    2.4   Verbs of 'expressing self recognition' (X said to Y 'I think I did something good'): *jactarse* "to brag", *vanagloriarse* "to take great pride", *alardear* "to boast", *presumir* "to show off", *preciarse* "to boast", *ufanarse* "to glory in, to be proud of".
    2.5   Verbs of expressing something new (X said to Y 'I think you don't know Z', 'I want you to know it'): *informar* "to inform", *enterar* "to inform", *avisar* "to let someone know", *notificar* "to notify", *prevenir* "to prevent", *advertir* "to warn", *anunciar* "to announce", *difundir* "to spread out".

2.6 Verbs of 'expressing the attribution of someone's responsability about some action' (X said to Y 'I think Z did something bad'): *culpar* "to blame", *acusar* "to accuse", *denunciar* "to denounce", *delatar* "to denounce", *responsabilizar* "to make someone responsible for", *achacar* "to attribute responsibility", *imputar* "to impute", *inculpar* "to assign guilt".

3. Connative/perlocutive verbs (X said to Y 'I want you to do/think Z').

3.1 Verbs of 'comunicating a request' (X said to Y 'I want you to do something; I know you don't have to do it if you don't want to'): *pedir* "to ask", *solicitar* "to request, to solicit", *requerir* "to require", *suplicar* "to beg", *rogar* "to beg", *implorar* "to implore".

3.2 Verbs of 'ordering' (X said to Y 'I want you to do something, I think you will do it because of this'): *ordenar* "to order", *exigir* "to demand", *mandar* "to command", *demandar* "to demand", *prescribir* "to prescribe".

3.3 Verbs of 'persuading' (X said to Y 'I want you to think that to do Z is good, if you do it is good'): *persuadir* "to persuade", *exhortar* "to exhort", *incitar* "to incite", *inducir* "to induce", *disuadir* "to dissuade", *sugerir* "to suggest", *convencer* "to convince".

3.4 Verbs of 'forgiveness' (X said to Y 'I think you know I feel something bad about something you did, I think maybe you feel something bad because of this. I don't want to feel bad after I say this. I want you not to feel bad after I say this'): *perdonar* "to forgive", *disculpar* "to excuse", *excusar* "to excuse", *indultar* "to pardon", *dispensar* "to excuse", *absolver* "to absolve".

4. Referential verbs (X said to Y what Z is like).

4.1 Verbs of 'describing things' (X said to Y what Z is like): *describir* "to describe", *definir* "to define", *exponer* "to expose", *presentar* "to present", *explicar* "to explain", *especificar* "to specify", *nombrar* "to name", *detallar* "to detail".

4.2 Verbs of 'describing an event' (X said to Y what happened): *narrar* "to narrate", *contar* "to tell", *relatar* "to relate", *referir* "to refer", *reseñar* "to review", *resumir* "to summarize".

5. Factive verbs. (X said some things to Y, Y said some things to X'): *platicar* "to talk", *dialogar* "to have a dialogue", *conversar* "to converse", *charlar* "to chat", *hablar* "to talk", *negociar* "to negotiate", *parlamentar* "to parly", *discutir* "to discuss", *debatir* "to debate".

6. Metalinguistic verbs (X said to Y 'someone could think Z is W, I want you to know Z is not W, I want you to know Z is Z'): *aclarar* "to clarify", *definir* "to define", *clarificar* "to clear up", *explicar* "to explain", *precisar* "to determine precisely", *esclarecer* "to make clear".

7. Poetic verbs (X said something to Y, he said it like this): *declamar* "declaim", *recitar* "to recite", *cantar* "to sing", *rezar* "to pray", *exclamar* "to exclaim", *entonar* "to speak with some inflexion in the voice", *deletrear* "to spell", *gritar* "to shout", *vociferar* "to speak vociferously", *gruñir* "to growl".

One of the advantages of using Jakobson's model for organizing this lexical domain is that it is possible to presume that languages are going to have ways of lexicalizing such features, as they are values that are always present in the communication process. If the lexical items in case refer to that process or are used during it, it's just natural that they can refer to those values in one way or another. In this sense, it is possible to assume that the kind of features that are crosslinguistically preferable to be lexicalized are among the ones that define these general sub-domains. As you can see above, each one of them can be paraphrased using the kind of primitives used in the NSM (Wierzbicka 1991; Goddard 1998; Goddard & Wierzbicka 2002). Here these paraphrases appear in simplified form. The general communication verbs correspond to the basic structure taking *say* as primitive, that is "X said something to Y"; the communication value of this kind of items arises from the structure of the definition, from the fact that the three variables subsume the whole communication schema: speaker, content and addressee. Emotive verbs correspond to the paraphrase "X said to Y "I think ..."; connative verbs have the structure "X said to Y "I want you to ...," etc. So they correspond to primitive meanings.

As Wierzbicka (1991) points out, labels as "ordering verbs", "requesting verbs", etc., commonly used for classifying speech act verbs, are for the most part misleading, in as much as they correspond to categories culturally determined; there is not such a universal linguistic meaning as "to order" or "to request". In this sense, our general classification is more naturally driven. We too are using this kind of categories to define more particular sub-domains, but they are just mnemotecnic names for semantic values that are better expressed by the kind of paraphrases that are used within de NSM.

Now, I will try to show how the values defining each sub-domain can have an impact in blocking or selecting the projection of the arguments of the frame. I focus in such cases involving the projection of the speaker's commentary, the projection of the referent, and in some of the alternative projections of the addressee. In what follows, I do a generic description of the verbals sub-domains implied, and then I present the semantic-syntactic schemas in which the verbs of those sub-domains are projected. These schemas show the different correlations that can arise between the semantic participants and the syntactic functions in which they are codified.

3.1   Generic communication verbs. (X said something to Y)

This sub-domain includes verbs as *comunicar* "to communicate", *decir* "to say", *expresar* "to express" and *hablar* "to speak". They can project the whole communication schema with all its formants, but canonically project a reduced one with the referent and the speaker's commentary unified as the message variable – (19), below –. What is important about this kind of verbs is that when the referent and the speaker's commentary are expressed as independent variables, it is the commentary which gets coded as the direct object, and the referent, in turn, is coded as an oblique complement – (18), below. In all cases, the addressee is coded as an indirect object.

These semantic-syntactic correlations are captured in the schemas that are shown below. In these schemas, and the ones that are presented in the rest of this work, S stands for subject, V stands for verb, DO stands for direct object, IO stands for indirect object, OBC stands for oblique complement and GEN stands for the genitive modifier of the NP in the direct object function. The words between hyphens that follow the oblique complement abbreviation (OBC) are the specific prepositions that introduce the complement in question. So, a schema like "S (speaker) + V + (DO (referent) + OBC – *con* – (addressee)" implies that: (1) the speaker gets coded as subject; (2) the referent of the communication projects into the direct object function, and (3) the addressee is coded as an oblique complement introduced by the preposition *con*. The linear order of the syntactic elements in the schemas is irrelevant and doesn't imply a similar ordering in the actual sentences.

(18) a. S (speaker) + V + DO (commentary) + IO (addressee) + OBC – *de/ acerca de* – (referent).

  b. *Juan dijo a María mentiras de Pedro.*
      Jonh said to Mary lies about Peter
      'John said to Mary lies about Peter.'

(19) a. S (speaker) + V + DO (message) + IO (addressee).

  b. *Juan dijo a María que Pedro no era un buen trabajador.*
      John said to Mary that Peter no was a good worker
      'John said Mary that Peter wasn't a good worker.'

3.2   Emotive verbs. (X said to Y "I think this about Z")

These are generic emotive verbs as *opinar* "to express an opinion", *argüir* "to argue" and *declarar* "to state". They just "refer" that the speaker is saying his opinion, but not what kind of opinion this is. For this reason, they can select the syntactic projection of both, the referent and the commentary, which still can be an open variable – (20) –. In a marked difference to the items in the first sub-domain, these verbs don't project the addressee and rather the focus is placed on the speaker's side of the schema.

(20) a. S (speaker) + V + DO (commentary) + OBC – *de/acerca de* – (referent).

  b. *Juan opinó de los niños que son muy gritones.*
      John say.an opinion about the kids that are very noisy
      'John expressed the opinion that the kids are very noisy.'

(21) a. S (speaker) + V + DO (message).

  b. *Juan arguye que los niños son muy gritones.*
      John argues that the kids are very noisy
      'John argues that the kids are very noisy.'

3.3   Verbs of "expressing the attribution of someone's responsibility about some action" (X said to Y "I think Z did something bad")

These items are semantically complex. Some of them are *culpar* "to blame", *acusar* "to accuse", *denunciar* "to denounce" and *delatar* "to denounce". They refer a double predication: firstly, they imply the speaker's attribution of some negative action regarding a third participant; secondly, they refer to the speaker's communication of that attribution to an addressee. The lexicalized commentary is the speaker's belief in the truth of his attribution of the negative action to the person pointed out. The referent of the communication is the attribution itself. It is composed by two inner formants; the negative action, which I'm referring to as referent 1 in the semantic-syntactic schemas below, and his possible doer, which I'm labeling referent 2. Both of these referents are projected independently into the syntax, and if the addressee appears, it is as a fourth complement coded as an oblique complement.

(22)   a.   S (speaker) + V + DO (referent 2) + OBC – *de/por* – (referent 1) + OBC – *con* – (addressee).

      b.   *Juan culpó   a   su hermanito   con   su   mamá   de hacer trampa.*
          John blamed ACC his brother.little with his mother of make trick
          'John blamed his little brother with his mother for making tricks.'

(23)   a.   S (speaker) + V + (DO (referent 1) + GEN – *de* – (referent 2)) + OBC – *con* – (addressee).

      b.   *Juan   denunció   el   crimen   de   Pedro   con   la   policía.*
          John   denounced the   crime   of   Peter   with   the   police
          'John denounced Peter's crime with the police.'

(24)   a.   S (speaker) + V + DO (referent 1) + IO (referent 2).

      b.   *Juan   le   achacó   el   crimen   a   Pedro.*
          John DAT blamed the   crime   to Peter
          'John blamed the crime on Peter.'

3.4   Verbs of "expressing praise or recognition to the addressee". (X said to Y "I think you did something good, I want you to feel something good because of this")

They refer the positive opinion of the speaker about the addressee or about his/her behavior. That is, items like *felicitar* "to congratulate", *reconocer* "to acknowledge" and *elogiar* "to praise", lexicalized a specific kind of commentary and for this reason the commentary variable is blocked. In consequence, it is the referent which is projected to the direct object function – (25) –. In this kind of construction the direct object NP usually appears with a genitive modifier that refers to the possesor or maker of the object of praise; this participant can be, and usually is, correferential with the addressee. There is another very productive construction in Spanish where the addressee is coded as direct object and the referent as an oblique complement – (26) –.

The alternation of these two constructions is ruled by the alternative conceptual focus on the addressee or on the referent of the praise, which is the addressee's behavior. If the focus is on the referent, then this is the one which is coded as direct object; if the focus is on the addressee, then this is coded as direct object. In this case, it is a connative value which is in charge of the projection in turn; this value can be captured as the last part of the paraphrase above: "I want you to feel something good because of this".

(25) a. S (speaker) + V + DO (referent).

b. *Juan alabó   los escritos de María.*
John praised the writings of Mary
'John praised Mary's writings.'

(26) a. S (speaker) + V + DO (addressee) + OBC – *por* – (referent).

b. *Juan felicitó   a   María por sus escritos.*
John congratulated ACC Mary for her writings
'John congratulated Mary for her writings.'

3.5 Verbs of "expressing disapproval to the addressee" (X said to Y "I think you did something bad, I want you to feel bad because of this")

This sub-domain includes items as *reprochar* "to reproach", *recriminar* "to recriminate", *reprobar* "to reprove" and *criticar* "to criticize". These are very similar to the verbs of "expressing praise". Their meaning implies an emotive value – the "I think ..." part of the paraphrase- combined with a connative feature – the "I want ..." part of the paraphrase -. This combination allows the coding alternation between the referent and the addressee.

(27) a. S (speaker) + V + DO (referent) + IO (addressee).

b. *Juan le   recriminó   su   comportamiento a María.*
John DAT recriminated her   behavior   to Mary
'John recriminated Mary for her behavior.'

(28) a. S (speaker) + V + DO (addressee) + OBC – *por* – (referent).

b. *Juan recriminó   a   María por su   comportamiento.*
John recriminated ACC Mary for her behavior
'John recriminated Mary for her behavior.'

3.6 Verb of "forgiveness" (X said to Y "I think you know I feel something bad about something you did. I think maybe you feel something bad because of this. I don't want to feel something bad after I say this. I want you not to feel something bad after I say this")

This is the case of verbs like *perdonar* "to forgive", *disculpar* "to excuse", *excusar* "to excuse", *indultar* "to pardon" and *absolver* – "to absolve", that just as the items above imply in their meaning the combination of an emotive value and a connative feature.

Again, this combination triggers the possibility of coding the addressee alternatively as direct object or as indirect object.

(29)   a.   S (speaker) + V + DO (addressee) + OBC – *de* – (referent).

   b.   *El   Padre   Juan   perdonó   a   Pedro de todos sus   pecados.*
        The Father John   forgave   to Peter of all   his   sins
        'Father John forgave Peter all of his sins.'

(30)   a.   S (speaker) + V + DO (referent) + IO (addressee).

   b.   *El   Padre   Juan   le   perdonó sus   pecados   a   Pedro.*
        The Father John   DAT   forgave his   sins   to   Peter
        'Father John forgave all his sins to peter.'

3.7   Verbs of "expressing something new" (X said to Y "I think you don't know Z", "I want you to know it")

These verbs lexicalize the speaker's evaluation about the addressee's knowledge about some situation. Among them are included *informar* "to inform", *enterar* "to acquaint", *avisar* "to inform", *notificar* "to notify" and *prevenir* "to prevent". They imply a connative feature: the speaker's desire that the addressee comes to know some new information that can serve him to change his mind and his acting. Again, in the first place, the lexicalization of the commentary permits the coding of the referent as the direct object; in the second place, it is the presence of the connative value what is behind the possibility of coding the addressee as direct object.

(31)   a.   S (speaker) + V + DO (referent) + IO (addressee).

   b.   *Juan le   informó   la   noticia a María.*
        John DAT   informed the news   to Mary
        'John informed the news to Mary.'

(32)   a.   S (speaker) + V + DO (addressee) + OBC – *de* - (referent).

   b.   *Juan   informó   a   María   de la   noticia.*
        John   informed ACC Mary   of the   news
        'John informed Mary about the news.'

3.8   Factive verbs. (X said some things to Y and Y said some things to X')

These are verbs like *platicar* "to talk", *dialogar* "to dialogue", *charlar* "to chat", *hablar* "to talk" and *discutir* "to discuss", that lexicalize the communicative interaction between the speaker and the addressee as a prime feature. They refer to a kind of reciprocal predication, as they denote a holistic event where two persons act at the same time as speakers and as addressees. That is, they imply the reciprocal act of communication between the speaker and the addressee. We can say that these items

lexicalize the "feedback" as their principal semantic feature. This situation has its syntactic consequences: in the first place, we can see that these verbs can project two alternative constructions resembling the commitative alternation. That is, on one side, they can project a construction where the two interactors are coded as the subject of the clause – (33) –, and, on the other side, they can instantiate a construction where one of the interactors is projected as subject and the other one as an oblique complement introduced by the preposition *con* – (34) and (35) –. In both cases, as the semantic focus is on the interplay between the two interactors, the referent can be coded as a direct object – (34) – or as an oblique complement – (35) –.

Other coding alternative for the addressee with the factive verbs, limited to some of them, is to code this argument as an indirect object – (36) –, but this construction implies a simple semantic schema where one person is speaking and one is listening, as it is common with the rest of the verbs in the domain.

(33) a. S (speaker/addressee 1 + speaker/addressee 2) + V + DO (referent).

   b. *Juan y   María dialogaron el   proyecto.*
       John and Mary dialogued the project
       'John and Mary dialogued about the project.'

(34) a. S (speaker) + V + DO (referent) + OBC – *con* – (addressee).

   b. *Juan discutió   todos sus problemas con   María.*
       John discussed all   his problems with Mary
       'John discussed all his problems with Mary.'

(35) a. S (speaker) + V + OBC – *con* - (addressee) + OBC – *de* – (referent).

   b. *Juan habló con María de   todos sus   problemas.*
       John talked with Mary of   all   his   problems
       'John talked with Mary about his problems.'

(36) a. S (speaker) + V + DO (referent) + IO (addressee).

   b. *Juan le   platicó sus problemas a   María.*
       John DAT talked his problems to   Mary
       'John talked to Mary about his problems.'

Summing up, the majority of the other verbs in the general domain of the verbs of saying doesn't imply a clear differentiation between the commentary and the referent, or doesn't lexicalize a combination of emotive and connative features as its principal meaning. In this sense, they don't present an argument competition for the direct object function and they don't require the implementation of alternative ways of coding. They all project the cannonical syntactic construction where the message is coded as direct object and where the addressee gets its canonical projection as indirect object.

The alternative semantic and syntactic constructional schemas arise when there are certain features in operation: first, when the speaker's commentary and the referent are differentiated, the commentary gets coded as the direct object, and the referent appears as an oblique complement introduced by the preposition *de* "of", or by the preposition *acerca de* "about". Second, when the commentary is lexicalized, as with the emotive verbs, the referent is coded as the direct object and the addressee as an indirect object, as it is expected; but there is also the possibility of coding the addressee as a direct object and the referent as an oblique complement; this possibility arises with items that we have classified as emotive verbs, and that along with the emotive value have a subsidiary connative feature. This is the case of the verbs of "expressing praise to the addressee", the verbs of "expressing disapproval to the addressee", the verbs of "expressing something new", and the verbs of "forgiveness". And third, the addressee can get an alternative coding as an oblique complement introduced by the preposition *con* "with" when there is a factive value at play; that is, when the semantic schema denoted implies the feedback as a feature and the predication is conceptualized as a complex reciprocal event. This is the case of factive verbs.

4.   Conclusion

I hope I have shown that for giving a more complete account of the semantic and syntactic phenomena related to a certain verbal domain, deepening the semantic characterization of such domain is required. One way of doing this is by analyzing the domain as a frame, that is, as an architecture functioning as a cognitive schema that has all the relevant information for the construal and interpretation of scenes inside a context situation. Finally, I have proposed that the relevant frame for analyzing the domain of "saying" verbs is Jakobson's communication model.

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Split intransitivity in Japanese revisited

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This paper revisits the question raised by Kishimoto (1996): what determines the unergative-unaccusative split in the behavior of the V1 in a Japanese deverbal nominal construction (V1-V2-GEN N) (e.g., *toke-kake-no yuki* "the snow, almost melted"). While previous accounts (e.g., Tsujimura & Iida 1999) relied on purely semantic treatments, this paper takes a fresh look at the construction, turning to syntax. This analysis crucially points out that the modifier subsumes two distinct units, "adjectival" and "reduced clausal," and that the V1s split differently in each type on the basis of lexical aspect (i.e., the former requires the V1 to be telic and the latter, non-state). Construction-specific requirements which further affect the distribution of the elements are also delineated.

1. Introduction

Van Valin (1990) argues that there are two principal semantic parameters that underlie split intransitivity across languages: agentivity and lexical aspect.* Acehnese is characterized as a language that exhibits a split on the basis of the former and Italian, the latter. For Japanese, Kishimoto (1996) makes a case for agentivity on the basis of the split pattern observed in an adnominal phrase, which he calls a "deverbal nominal construction" (DNC), given in (1).[1]

> (1) a. *kare-kake-no*   *hana*
>   wither(V1)-KAKE(V2)-GEN   flower
>   'a flower, almost withered' (ibid.: 257)

1.   The following abbreviations are used: ACC = accusative; CLM = clause linkage marker; COP = copula; DNC = deverbal nominal construction; GEN = genitive; L = linker; LS = logical structure; NOM = nominative; NP = noun phrase and NPAST = non-past.

b.   *hataraki-kake-no roodoosya
work-KAKE-GEN   worker
'the worker, almost working' (ibid.: 255)

The DNC refers to a complex NP (V1-V2-GEN N), whose head noun is modified by a genitive-marked deverbal compound that consists of the base verb (V1) and an aspectual phase verb (V2) -kake "(lit.) to suspend". According to Kishimoto (1996: 284), only a non-agent can head the NP as illustrated by the felicity of (1a), whose head noun is non-agent hana "flower" and by the infelicity of (1b), whose head noun is agent roodoosya "worker".

In contrast, works subsequent to Kishimoto (1996) take a different position (Toratani 1998; Tsujimura & Iida (T&I) 1999; Kuno & Takami (K&T) 2003). Although the specifics of their proposals differ, they all find aspect to be the most relevant factor in the selection criteria of the intransitive verbs in the DNC.

This paper revisits this question of what determines the split in the behavior of the V1 in the DNC. While aspect still plays a fundamental role in determining the split, the proposal herein considerably differs from those made previously in that it finds that the modifier within the DNC is not simply one singular type of entity but can be either of two distinct types, referred to by the terms "adjectival" and "reduced clausal" (henceforth "clausal"). This paper argues that whereas the adjectival modifier contains a lexical compound, the clausal modifier contains a syntactic compound, and the V1 is constrained differently in terms of lexical aspect in each compound type. The V1 must be telic in the former and non-state in the latter. Construction-specific requirements also affect the distribution of the elements in DNC. Thus, this paper lends support to a semantic account of the split intransitivity in Japanese, but also appeals to the need to pay attention to the syntax of the DNC in the sense that the modifier can take the form of either of two distinct structures: adjectival or clausal, but not in the sense of Perlmutter (1978) and Burzio (1986) among others, who distinguish intransitive verbs into unergatives and unaccusatives which are associated with two distinct underlying syntactic structures.

In order to elucidate this phenomenon, this paper first reviews the previous literature in Section 2. Then, Section 3 discusses the distinction between the adjectival and the clausal modifier structures. Section 4 proposes the logical structures for the DNC, and Section 5 provides a conclusion.

2.   Previous studies

To account for the split intransitive pattern exhibited in (1), Kishimoto (1996: 269), working within the framework of Role and Reference Grammar, hypothesizes (2).

(2)   A deverbal nominal may modify only the lowest ranking nonagent macrorole argument on the Actor-Undergoer hierarchy in the LS of the verb.

Insofar as intransitive verbs are concerned, (2) essentially means that only a nonagent macrorole (actor or undergoer) is permitted to serve as the head noun of the DNC.

In response to Kishimoto's agency-based proposal, Toratani (1998) and T&I (1999) independently note that (2) is untenable as it makes incorrect predictions about the acceptability for the DNC. They present counterexamples such as in (3).

(3)   a.   *oti-kake-no   pen*
           fall-KAKE-GEN pen
           'half-fallen pen' (Toratani 1998: 381)

      b.   *pan-o   tabe-kake-no Taroo*
           bread-ACC   eat-KAKE-GEN Taro
           'Taro, eating bread halfway' (T&I 1999: 115)

      c.   *keganin-ga   sini-kake-no   byooin*
           injured.person-NOM die-KAKE-GEN hospital
           'the hospital at which the injured person is about to die' (ibid.: 121)

The hypothesis in (2) predicts that a non-agent macrorole such as *pen* "pen" should be permitted as head noun of the DNC NP. However, the infelicity of (3a) shows that it cannot. Hypothesis (2) also predicts that neither an agent macrorole nor a non-macrorole can head the NP. The felicity of (3b) and (3c) contradicts this prediction. In (3b), the agent macrorole *Taroo* serves as the head noun of the NP. In (3c), the non-macrorole *byooin* "hospital" does.

Alternatively, Toratani (1998) argues that the V1 must be [–punctual, +telic] to be grammatical in this construction. However, this also falls short of accounting for an example like (4), in which the argument of a [+punctual, +telic] verb *sin-* "die" is occurring as the head noun.

(4)   *sini-kake-no   kontyuu*
      die-KAKE-GEN insect
      'an insect, almost dying' (Kishimoto 1996: 269)

T&I (1999) point out that the acceptability of the construction depends on the meaning of *-kake*, bringing to light data such as (5a).

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2.   A note on English glosses is in order. We assume that *-kake* is monosemous and that it expresses that an event denoted by the V1 is suspended from progressing further toward the "change-of-state" point (K&T 2003: 291). For instance, (1a) in the main text expresses a condition of the flower which started its process of withering but is currently suspended from progressing further toward the "completely-withered" condition. Since *-kake* does not have a precise equivalent in English, it would be rendered differently using expressions such as *almost*, *half-*, *about to* and so forth depending on the context. Thus, multiple glosses are used purely for the purpose of ease of exposition, and different glosses should not be interpreted as referring to distinct senses of *-kake*.

(5)   a.   *hasiri-kake-no   kodomo*
             run-KAKE-GEN   child
             'a child, just about to run' (T&I 1999: 125)

       b.   **hasiri-kake-no   kodomo*
             run-KAKE-GEN   child
             'the child, almost running' (Kishimoto 1996: 277)

According to T&I (1999), *-kake* yields two readings, "halfway" and "inceptive", and
the interpretation depends on the non-punctuality and telicity of the situation.[3] They
observe that the base verb *hasir-* "run" can enter into the construction under the
"inceptive" reading (5a), but not under the "halfway" reading (5b) (i.e., "the child,
running halfway" (intended)). While their observations are insightful, it remains to
be explained why the felicity of the phrase changes when the reading changes. K&T
(2003) also offer a semantic account. They observe that the DNC in (5) must express
the sense of being held back, and hence the phrase is acceptable only when it refers to
a scene where the child, who is about to run out, is held back from behind. The rela-
tion between having this particular sense and the felicity of the construction in general
remains unclear. For instance, a phrase such as (1a) *kare-kake-no hana* "a flower, almost
withered" is felicitous although it involves no sense of being held back.

3.   Two types of modifier

3.1   Proposal

This paper proposes that the modifier constituent of the DNC is not structurally mono-
lithic but rather is comprised of two syntactically different types. This follows the
insight of Kusumoto (2002), who analyzes the non-reduced Japanese adnominal con-
struction with the past tense marker *-ta* exemplified in (6).

(6)   *kawai-ta   taoru*
       dry-TA   towel
       'dry towel'
       'towel that dried' (ibid.: 163)

Kusumoto argues that *-ta* in (6) is ambiguous between non-past *-ta* and past tense *-ta*
giving rise to a stative reading (dry towel) and an eventive reading (towel that dried)
respectively (cf. Teramura 1984: 197).[4] Although the particulars of the construction type

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3.   Baika (2000) offers an account of split intransitivity in Japanese on the basis of the term
boundedness. It appears to be akin to the notion of telicity used in T&I (1999), although it is
not made clear. Whichever sense he intended, the split patterns observed in the DNC cannot be
covered solely on the basis of one aspectual notion.

4.   Ogihara (2004) also analyzes the semantics of *-ta*, noting that one of the interpretations
is analogous to that of English adjectival past participles. This paper also recognizes that the

dealt with here are different, the DNC is noticed to display a similar semantic contrast: it also can yield both a stative reading and an eventive reading, as exemplified in (7).

(7) *tabe-kake-no   banana*
     eat-KAKE-GEN banana

     a. 'the half-eaten banana'
     b. 'the banana (which) *x* almost ate/(is) eating'

Under the stative reading, the modifier denotes a certain property of the referent of the head noun (i.e., "the half-eaten banana") without making reference to the actor, the eater, either implicitly or explicitly. Under the eventive reading, the modifier refers to someone's eating event (i.e., "the banana (which) *x* almost ate/(is) eating") although the eater is not phonologically realized.

This stative-eventive difference is best explained as a syntactic distinction between adjectival and clausal modifier. The adjectival modifier takes the form *V1-kake-no*. The clausal modifier consists of a *no*-marked reduced clause with a non-finite compound verb but requires the presence of its arguments full-fledgedly within the clause, either overtly or covertly. Thus, two separate structures can be actualized as the phrase in (7). Example (8) accounts for the two different structures underlying the phrase in (7).

(8) a. *tabe-kake-no   banana*
         eat-KAKE-GEN banana
         'the half-eaten banana'

     b. (*Tomoko-ga*)   *tabe-kake-no   banana*
         Tomoko-NOM eat-KAKE-GEN banana
         'the banana (Tomoko) almost ate/(is) eating'

Example (8a) contains an adjectival modifier. Example (8b) presents a clausal modifier where the actor argument, such as *Tomoko*, may be ellipsed.

This distinction between adjectival and clausal modifier is illustrated in Figure 1 which makes reference to the Layered Structure of the Clause (Van Valin & La Polla 1997).

Figure 1a represents the adjectival modifier constituent of a DNC, and Figure 1b represents the clausal modifier constituent of a DNC. The adjectival modifier contains a lexical compound *V1-kake* case-marked by *no*, and the clausal modifier contains a syntactic compound *V1-kake* followed by a clause linkage marker (CLM) *no*. As both modifiers are adjuncts, they appear in the PERIPHERY$_N$. Since adjectives are the modifier of the NUC$_N$ (Van Valin 2005: 24–26), the elements contained in the PERIPHERY$_N$ are assumed to be modifying the head noun at the NUC$_N$ level in each type. This is a subject for further research. The lexical-syntactic distinction is made following RRG's assumption that "lexical phenomena affect the logical structure [LS]

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distinction of the two readings associated with *V1-kake* is analogous to the long noted distinction in English noun modification (e.g., Bolinger 1967): one by a participial (e.g., *the broken cup*) and the other by a relative clause (e.g., *the cup that was broken by the child*).
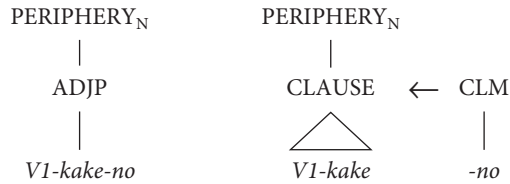
PERIPHERY$_N$ PERIPHERY$_N$
| |
ADJP   CLAUSE   ←   CLM
| △ |
V1-kake-no   *V1-kake*   *-no*

Figure 1. The adjectival modifier (a) and the clausal modifier (b).

of the predicate [...], whereas syntactic phenomena deal with the morphosyntactic realization of the macroroles and other core arguments" (Van Valin 2005: 158). Thus, lexical compounds are those newly derived from the V1 and *-kake*, which has an LS distinct from that of the V1, whereas syntactic compounds are those which combine the V1 and *-kake* compositionally, represented in a complex LS which takes the V1's LS as its own argument. Hence, the V1 in the syntactic compound maintains its argument structure intact, while the one in the lexical compound does not (see Section 4 more on this topic). The following subsection discusses the distinction focusing on the characteristics of the *V1-kake* compounds.

3.2   Distinction

Bhat (1994: 141) notes that "[v]erbs used in their extended function of nominal modification have been found to lose several of their categorical characteristics and to take on characteristics of adjectives." Some *V1-kake* compound verbs can be seen to be bearing this category-shifting property.

Kishimoto (1996: 254) notes that *V1-kake* can function as an independent noun. However, this can only occur with some compounds. In (9), examples are provided of the compounds with a transitive V1 (a–d), and with an intransitive V1 (e–h).

(9)   a. *kaki-kake*   'a half-written thing'
     b. *nomi-kake*   'a half-drunk thing'
     c. *tukuri-kake*   'a half-made thing'
     d. *ami-kake*   'a half-knit thing'
     e. *kusari-kake*   'a half-rotten thing'
     f. *koware-kake* 'a half-broken thing'
     g. *kare-kake*   'a half-withered thing'
     h. *toke-kake*   'a half-melted thing'

A compound of this type has the meaning of noun; it denotes a tangible entity that has undergone a change of state to a midway point. For example, (e) *kusari-kake* rot-KAKE refers to half-rotten perishables such as a tomato with a deteriorated look, which has undergone a change from a "not-rotten" to a "half-rotten" state. The compounds in (9) can be argued to be nominal since their distribution matches that of a noun (10).

(10) (*Sono*) *kusari-kake-o   sute-ta.*
      that   rot-KAKE-ACC   toss-PAST
      'I tossed away (that) half-rotten thing.'

In (10), *kusari-kake* "a half-rotten thing" can be preceded by a demonstrative *sono* "that" and marked by the accusative case marker *o*.

In contrast, some compounds cannot convey the same types of meaning as seen in (9). In such instances, they are either nonsensical or uninterpretable (11).

(11) a. ?? *oki-kake*   'a half-put thing'
      b. ?? *kai-kake*   'a half-kept thing'
      c. ?? *mati-kake*   'a half-waited thing'
      d. ?? *sonae-kake* 'a half-offered thing'
      e. ?? *iri-kake*   'a half-needed thing'
      f. ?? *de-kake*   'a half-exited thing'

In (11), the V1-*kake* compounds are infelicitous in denoting nominal entities. For example, *oki-kake* (a) cannot denote an entity such as a book because its outward appearance shows nothing about the change of state that is presumably happening to the entity.

Besides being nominal, the compounds in (9) behave as an adjective. Japanese adjectives can occur both at the attributive position and at the predicate position. The compounds in (9) can appear pre-nominally expressing an attribute of the referent of the head noun when they are marked by *no* (e.g., *kusari-kake-no tomato* "a half-rotten tomato"), and this is the form of the DNC (see also (14a–b)). To occur at the predicate position, the compounds in (9) require a copula *-da* (see (12)), following the pattern of a subset of Japanese adjectives (e.g., *benri-da* convenient-COP.NPAST "(It) is convenient") (cf. Kuno 1973).

(12) a. *Kore-wa kaki-kake-da.*
          this-TOP write-KAKE-COP.NPAST
          'This is in a half-written condition.'

      b. *Kore-wa nomi-kake-da.*
          this-TOP drink-KAKE-COP.NPAST
          'This is in a half-drunk condition.'

In (12), being following by the copula, the compounds such as *kaki-kake* write-KAKE can felicitously occur at the predicate position.

On the other hand, some compounds are awkward at the predicate position (13).

(13) a. ??*Kore-wa oki-kake-da.*
          this-TOP put-KAKE-COP.NPAST
          'This is in a half-put condition.'

      b. ??*Kore-wa age-kake-da.*
          this-TOP give-KAKE-COP.NPAST
          'This is in a half-given condition.'

In brief, these examples show that *V1-kake* compounds do not form a homogenous group. They do not exhibit uniform characteristics, and only some can function as a lexical word.

If the compounds in (9) are lexical words that can be used adjectivally in the pre-nominal position, it is predicted that the adjectival modifier can readily precede the head noun without sounding elliptical in the DNC as it is a one-place predicate. However, if the modifier is clausal, it is predicted that the phrase would sound elliptical if the base verb were semantically non-monovalent and only one argument is realized as the head noun. Examples (14) and (15a) test these predictions.

(14)   a.   *kaki-kake-no   tegami*
               write-KAKE-GEN   letter
               'a half-written letter'

          b.   *nomi-kake-no   zyuusu*
               drink-KAKE-GEN   juice
               'a half-drunk juice'

(15)   a.   *??tuki-kake-no   kuruma*
               arrive-KAKE-GEN   car
               'a car, almost arriving'

          b.   *eki-ni   tuki-kake-no   kuruma*
               station-LOC   arrive-KAKE-GEN   car
               'a car, almost arriving at the station'

Although the V1s in (14) are both transitive, neither phrase sounds elliptical. This suggests that the argument structure of the V1 is no longer bivalent in (14). In (15a), the base verb is *tuk-* "arrive" that requires both the "arriver" and the "location" in its semantic representation. If only the arriver is phonologically realized as in (15a), the phrase sounds elliptical. If the locative phrase is added as in (15b), the acceptability improves. This indicates that the unit dealt with in (15) is clausal, which requires the presence of all the arguments of the V1 in the semantic representation. The next section considers the adjectival-clausal difference in terms of the logical structure.

4.   Logical structures

To capture the semantic difference yielded by the adjectival and the clausal modifier, two different LSs must be posited for the DNC: one for the DNC with an adjectival modifier and the other for the DNC with a clausal modifier.

4.1   LS of the DNC with an adjectival modifier

The DNC with an adjectival modifier is posited to have the following LS (16).

(16)   **pred'** ($\underline{x}$)

This is an ʟs of a result state predicate, where the argument is marked by the thick dashed underscoring, following the convention used in Van Valin (2005), in order to indicate that the *x* argument is the head noun of the ᴅɴᴄ. Lexical *V1-kake* compounds denote the condition of an entity at one transitional point in a process during which a change of state takes place. For example, *kaki-kake* "a half-written thing" denotes the condition of an object that has partially undergone a change from a "not-at-all-written" to a "some-portion-written" condition, and this partial condition is observed to be characterizable as a property denoted by a stage-level predicate (Carlson 1977). Since stage-level predicates are assumed to have the result state ʟs, **pred′** (x) (Van Valin 2005: 49), lexical compounds can also be assumed to be represented by the result state ʟs, which can alternate with (16) if the lexical compound occurs pre-nominally.

　　Furthermore, as a state predicate can be obtained by canceling the INGR and BECOME operators, (16) could also be posited to be derived via lexical rule from a telic verb (17).

(17)　(…) INGR/BECOME **pred′** (x) + *-kake* → **pred′** (x)

As per (17), a telic verb whose result state predicate part is 1-place could create the state predicate. The verb could be an achievement (e.g., *sin-* "die"), an accomplishment (e.g., *kusar-* "rot"), an active accomplishment (e.g., *tabe-* "eat it"), a causative achievement (e.g., *otos-* "drop"), or a causative accomplishment verb (e.g., *kusaras-* "let rot"). However, the lexical rule in (17) overgenerates the result state predicate. There appears to be at least two types of constraint at work. For one, it seems that the intransitive verb usually serves as the input to create the result state predicate when there is a morphologically related intransitive-transitive pair. The transitive one could not serve as input as it would make reference to the entire event requiring both the actor and the undergoer in the semantic representation (e.g., intransitive: *toke-kake* "a half-melted thing/be in the half-melted condition" vs. transitive: *tokasi-kake* "be in the condition where someone has started melting"). Another constraint is that the argument must be a tangible entity whose appearance can demonstrate that the change-of-state has evidently progressed to a midway point. Accordingly, verbs that are usually predicated of an intangible object cannot be the input ʟs: e.g., **sugi-kake* "pass-ᴋᴀᴋᴇ" (referring to time) and **huke-kake* "becoming late-ᴋᴀᴋᴇ" (referring to night), or the verbs whose sole arguments do not evidently exhibit the change-of-state in the appearance cannot be the input ʟs: e.g., **sodati-kake* "grow-ᴋᴀᴋᴇ" (referring to a child) and **motare-kake* "not digest well-ᴋᴀᴋᴇ" (referring to one's stomach). In short, the V1 must be telic to be combined with *-kake* but other constraints are also at work to derive the result state ʟs.

4.2   LS of the DNC with a clausal modifier

The semantic relation of the clausal modifier to the head noun in the ᴅɴᴄ closely parallels the case of an English restrictive relative clause modifying the head noun in that the modifier contains a gapped argument, and this argument is identified with the referent of the head noun. For example, this can be seen below in (18).

(18) *Tomoko-ga tabe-kake-no banana*
Tomoko-NOM eat-KAKE-GEN banana
'the banana (which) Tomoko (is) almost eating'

In (18), the non-finite clause *Tomoko-ga tabe-kake-no* contains a gapped argument (i.e., *banana* "banana"), and this argument is identified with the referent of the head noun of the DNC.

Given this parallel semantic relation, one might similarly hypothesize that the DNC with a clausal modifier has the LS in (19), which follows the LS of a complex NP with an English restrictive relative clause.

(19) **be′** (x_i, [**pred′** (…..y_i…)]), where *y* is lexically unfilled

English restrictive relative clauses are posited to have a complex attributive LS (Van Valin 2005: 267), in which the head argument appears as the 1st argument (*x*) and the LS of the modifying clause appears as the 2nd argument [**pred′** (…..y_i…)]. The gapped argument (*y*) contained in the embedded LS is co-indexed with the 1st argument of the attributive LS in order to ensure identity. In the case of Japanese, the *y* argument always remains lexically unfilled since Japanese lacks relative pronouns.

Note that the embedded LS itself is complex. The LS of the V1 is first combined with the LS of -*kake*, creating a complex LS that would look like **suspended′** (LS), where LS is the V1's LS. Here, the V1 must be non-state, since state verbs are incompatible with -*kake* as noted in Kindaichi (1950[1976]: 17) (**ari-kake* exist-KAKE).[5] Then, this entire LS enters into the attributive LS as its 2nd argument.

Beyond the non-state requirement, the DNC with a clausal modifier is subject to further constraints. First, the head argument must be animate in order to express the condition that obtains during the "onset" (Freed 1979) phase, where a full-fledged activity is about to take place. Freed (1979: 32) observes that the onset phase which involves an inanimate entity as an instigator of the action is difficult to portray. This extends to the case of -*kake* combined with a 1-place activity verb (20).

(20) a. *naki-kake-no akatyan*
cry-KAKE-GEN baby
'baby, almost crying'

b. *??mawari-kake-no koma*
spinn-KAKE-GEN top
'top, almost spinning'

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5. T&I (1999: 126) comment that *sinzi-* "believe" (*sinzi-kake-no uwasa* "the rumor (that every one is) just about to believe") can serve as the V1 although it is a state verb. This paper notes that this *sinzi-* is a non-state telic verb which refers to the sense of "become a believer of".

Example (20a), which contains an animate argument, is felicitous. However, (20b) with its inanimate argument is infelicitous. This is due to the fact that a baby can show a sign of crying by changing its facial expression but a top cannot initiate a spinning action without an external cause. Naturally, the midpoint of the onset phase of the spinning action cannot be captured by the DNC if the sole argument is inanimate.

Secondly, the process phase of the event must be perceivable as "remaining in a state of suspension" as noted in K&T (2003: 291). This would ban the DNC from portraying a condition that goes counter to the law of gravitation (21).

(21) a. *tore-kake-no   botan*
          come off-KAKE-GEN button
          'a button, almost coming off'

      b. **oti-kake-no   hon*
          fall-KAKE-GEN book
          'book, almost falling'

Example (21a) is felicitous because a button can hang loosely on a piece of clothing, whereas (21b) is infelicitous because an object cannot disobey gravity and remain midair once it looses contact with the ground object. This condition may allow for a contextual override. (21b) may be deemed acceptable if this were the title of a photograph that captures a particular moment of a book traveling in midair. This suggests that the DNCs are not simply constrained semantically but are sensitive to the pragmatic context in which they appear.

4.3   Split intransitivity

Having delineated the semantic restrictions imposed on the elements in the DNC, we can now turn to the split in the behavior of the V1. There are four points to be addressed. First, Kishimoto's (1996) examples can be accounted for on the basis of (17). For instance, the contrast of felicity seen in (1a) *kare-kake-no hana* "a flower, almost withered" and (1b) *hataraki-kake-no roodoosya* "the worker, almost working" can be explained as follows: the V1 in (1a), *kare-* "wither", is a telic verb, from which the result state LS is derivable, whereas the V1 in (1b), *hatarak-* "work", is an activity verb, from which the result state LS is underivable. The basis for the split pattern is not agentivity but is lexical aspect (22).

(22) a. **huri-kake-no ame*   'the rain, half-fallen'
      b. **mawari-kake-no koma*   'the top, half-spun'
      c. **yure-kake-no ki*   'the tree, half-swung'

Although, according to Kishimoto's proposal (2), the above should all be felicitous because the sole arguments are all non-agent macroroles, these activity verbs that take an inanimate argument are consistently ungrammatical in (22). This is because the result state LS is underivable from an activity verb.

Secondly, various examples brought to light by T&I (1999) such as (3b–c) which serve as counterexamples to Kishimoto's (1996) hypothesis can be accounted for on the basis of (19), the ʟs of a clausally modified ᴅɴᴄ. Recall that T&I point out that not only an agent (3b) but also a non-macrorole (3c) can head the ᴅɴᴄ contrary to the prediction of (2). The lexical aspectual compatibility requirement on the V1 in this case is that the V1 must be non-state because states are incompatible with *-kake* (Kindaichi (1950[76]: 17). Since neither of the V1s in (3b–c), namely *tabe-* "eat" and *sin-* "die", are non-state, nothing prevents them from entering into the construction, and, hence, the phrases are felicitous.

The above analysis can also account for a third seemingly problematic example for previous accounts, the seemingly inconsistent behavior of *hasir-* "run" in (5). That the same verb can serve as the V1 in one instance (5a) but is rejected in another (5b) can be accounted for by a distinction in ʟss for the two examples. Example (5a) can be argued to have an attributive ʟs (19), and (5b) is an instantiation of a result state ʟs (16). The former requires the V1 to be non-state, whereas the latter requires the V1 to be telic. Since *hasir-* "run" is an activity verb, it fulfills the non-state requirement in (5a), and therefore, can serve as the V1. On the other hand, the same verb cannot serve as V1 in (5b) because the verb is atelic, from which the result state ʟs is underivable.

Lastly, one might consider split intransitivity in terms of unaccusativity, as it was Kishimoto's (1996) original goal to identify what distinguishes unergative verbs from unaccusative verbs in Japanese. Kishimoto characterizes unaccusativity as follows: "[t]he semantic basis of the intransitive split in Japanese is that if the sole argument is agent, the verb is unergative, and otherwise, unaccusative" (1996: 284). Examples such as (22) undermine the significance of this unaccusative-unergative distinction posited in Kishimoto (1996) because they pattern on a par with unergatives being unable to enter into the ᴅɴᴄ, although the verbs in (22) are unaccusative (since their sole arguments are non-agent), which should be able to enter into the ᴅɴᴄ.

5.   Conclusion

This paper argued that the distribution of the elements in the ᴅɴᴄ can be more systematically accounted for by distinguishing between two different syntactic structures, the adjectival and the reduced clausal modifier, which both form the ᴅɴᴄ. The V1s that enter into the ᴅɴᴄ must first fulfill the lexical aspectual requirement imposed by *-kake* in each type. Construction-specific conditions furthermore affect the distribution of the elements in the ᴅɴᴄ. The conditions recognized pertain to the morphological shape of the V1 and the physical properties of the referent of the head noun for the ᴅɴᴄ with an adjectival modifier. For the ᴅɴᴄ with a clausal modifier, the conditions refer to the animacy of the referent of the head noun and the suspendability of the V1's event . This paper argued that the split patterns of the V1s in the ᴅɴᴄ are independent of the unaccusative-unergative distinction posited in Kishimoto (1996) but sensitive

to the V1's lexical aspect, the construction-specific meaning and the discourse context where the construction occurs, corroborating Kuno & Takami (2004).

The adjectival-clausal dichotomy mirrors how the *V1-kake* compound is formed, viz., lexically or syntactically. Although theories may differ as to how they distinguish syntactic from lexical phenomena, this paper highlighted that this is an important distinction by showing that the seemingly inconsistent behavior of the V1 in the DNC with respect to the split intransitivity noticed in Tsujimura & Iida (1999) can be accounted for by recognizing the lexical-syntactic distinction in the sense of Van Valin & LaPolla (1997) and Van Valin (2005).

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Reintroducing inverse constructions in Japanese

The deictic verb *kuru* "to come" in the paradigms of argument encoding

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This paper reexamines the Japanese deictic verb *kuru* "to come" within the RRG framework and argues that its auxiliary use should be analyzed as a kind of inverse marker, elaborating on Shibatani (e.g., 2003). We show that the division of labor between the active-passive system and the direct-inverse system in Japanese involves complicated pragmatic factors. Specifically, it is when a Privileged Syntactic Argument (PSA) is topical but there is another participant that outranks PSA on the person hierarchy (usually speaker or hearer) that the direct-inverse paradigm is obligatorily used, although it may be optionally employed when a PSA is in focus domain. The present study adds a new insight to the growing body of studies on inverse phenomena (Payne 1994), as well as to the typology of PSAs proposed in RRG.

1. Introduction

In the typological literature, the inverse construction and related phenomena have attracted a certain amount of attention (Givón 1994). But its place within the overall typology of argument encoding, let alone its treatment within RRG, is yet to be explored (see however Van Valin & LaPolla 1997: 373–376 for brief notes). This paper is an attempt to reexamine the Japanese deictic verb *kuru* "to come" and argues that its auxiliary use in converb constructions should be analyzed as a kind of inverse marker. We will also argue that what have been treated as benefactive constructions have inverse-like functions as well. It will be shown that the system for argument encoding in Japanese is more complicated than is commonly assumed, and should be reinterpreted as having a direct-inverse paradigm with elaborate pragmatics.

The organization of this paper is as follows: Section 2 reviews the person hierarchy and inverse phenomena; Section 3 provides a hypothesis on the distribution of inverse, passive, and benefactive constructions in Japanese; Section 4 is for summary and conclusion.

2.   Illustration of the phenomena: Inverse constructions in Japanese

2.1   "Voice" and the person hierarchy

The person hierarchy plays an important role in various grammatical phenomena in many languages of the world. For instance, in a number of languages, e.g., Tangut and Plains Cree (see (1) below), agreement morphology on the transitive verb is triggered consistently by the participant that ranks higher on the person hierarchy, irrespective of its grammatical role (DeLancey 1981). It is also well known that so-called split ergativity is conditioned by person or more generally animacy hierarchy (Silverstein 1976). For example in Dyirbal, a quintessential ergative language, first and second person pronominal arguments exhibit an accusative alignment while others display an ergative alignment (Dixon 1994).

In some languages, the grammatical sensitivity to the person hierarchy is manifested in the selection of "voice" forms. In Plains Cree (Algonquian), the direct form is used obligatorily when the actor outranks the undergoer on the person hierarchy (in this case 2nd > 1st > 3rd proximate > 3rd obviative), whereas the inverse form is obligatory when the undergoer outranks the actor on the hierarchy. The following examples illustrate this point:

(1)   a.   *Ni-sēkih-**ā**-nān*   *atim.*
            1-scare-DIRECT-1PL   dog
            'We scare the dog.'

    b.   *Ni-sēkih-**iko**-nān*   *atim.*
            1-scare-INVERSE-1PL   dog
            'The dog scares us.'   (from Klaiman 1993: 345)

While in both examples the form of person agreement remains the same (i.e., 1PL), the choice between *ā* and *iko* encodes the predicate-argument relation by indicating whether the actor is higher on the animacy hierarchy than the undergoer.

In other languages, the relevant "voice" opposition controlled by the person hierarchy is the active-passive opposition with valence reduction, rather than the direct-inverse. In Lummi (Salish), for instance, there is an obligatory selection of voice in the following way. An active sentence is the only possible sentence type in encoding transitive events in which the actor ranks higher than the undergoer on the person hierarchy (in this case 1st, 2nd > 3rd), as in (2a), and the corresponding passive sentence is not available. On the other hand, a passive sentence is the only choice when the undergoer outranks the actor on the person hierarchy, as in (2b), and there is no corresponding active form.

(2)   a.   *x̣či-t-sən*   *cə   swəy'qə'.*
            know-TR-1SG.NOM   the   man
            'I know the man.'

b. *χ či-t-ŋ-sən   ə   cə   swəyʔqəʔ.*
    know-TR-**PASS**-1SG.NOM by the man
    'I am known by the man.'   (from Jelinek & Demers 1983: 168).

The direct-inverse opposition is found in Algonquian and Athabaskan languages of North America (with some reservations for the latter, however), plus some Siberian, Australian, Dravidian, and Tibeto-Burman languages (Comrie 1980; DeLancey 1981). Obligatory passives as illustrated in (2) are also observed in other Salish languages and some Tanoan languages of North America (Mithun 1999).

It is shown in this paper that Japanese is yet another language which exhibits remarkable sensitivity to the person-based ranking of participants. What is of special interest is the fact that Japanese has, besides passives, constructions that can be characterized as inverse constructions whose use is determined by the ranking of event participants in terms of person (cf. Shibatani 2003, 2006). In the following subsections, we will summarize Shibatani's analysis of inverse and passive constructions in Japanese, and then move on to discuss its inadequacies.

2.2   Shibatani (2003, 2006) on inverse and passive voice forms in Japanese

Shibatani (2003) points out that the deictic directional verb *kuru* "to come" functions as an inverse marker in a way somewhat similar to the inverse suffix in Algonquian languages (see (1) above) in certain contexts. Consider the following sentences (from Shibatani 2003: 273–276; the person and the direction of action are indicated in brackets):

(3) a. *Boku-wa Hanako-ni booru-o {nage-ta/   *nage-te   it-ta}.* [1>3]
         I-TOP   Hanako-to ball-ACC throw-PAST/ throw-CONV **go**-PAST
         'I threw the ball to Hanako.'

     b. *Boku-wa kimi-ni tegami-o {kai-ta/   *kai-te   it-ta}.* [1>2]
         I-TOP   you-to   letter-ACC write-PAST write-CONV **go**-PAST
         'I wrote a letter to you.'

     c. *Kimi-wa Ken-ni denwa-o   {shi-ta/   *shi-te   it-ta}?* [2>3]
         you-TOP Ken-to telephone-ACC do-PAST   do-CONV   **go**-PAST
         'Did you telephone Ken?'

(4) a. *Hanako-ga   boku-ni booru-o {*nage-ta/   nage-te
         Hanako-NOM I-to   ball-ACC throw-PAST throw-CONV
         ki-ta}.* [3>1]
         come-PAST
         'Hanako threw me the ball.'

     b. *Kimi-ga boku-ni tegami-o {??kai-ta/kai-te   ki-ta}.* [2>1]
         you-NOM I-to   letter-ACC   write-PAST write-CONV **come**-PAST
         'You wrote me a letter.'

    c.   *Ken-wa* *kimi-ni* *denwa-o*   {*??shi-ta*   /*shi-te*   **ki**-*ta*}*?* [3>2]
          Ken-TOP you-to telephone-ACC do-PAST do-CONV   **come**-PAST
          'Did Ken telephone you?'

In (3a)–(3c), the verbs must be unmarked (i.e., not accompanied by *-iku* "go") in order to encode the intended meaning. The actors are ranked higher on the person hierarchy than the dative-marked goal/recipient arguments in these examples. The zero-marked form is used for motions/actions directed away either from the deictic center or from any location that is neutral with respect to it. On the other hand, in (4a)–(4c), where the actors are lower on the person hierarchy than the goal/recipient arguments, the matrix verbs are accompanied by the venitive directional verb *kuru* "to come". In other words, *kuru* "to come" is required when motions/actions are directed toward the higher-ranking participant on the person hierarchy, and in this regard *kuru* is considered to be functioning as an inverse marker. Note that *kuru* "to come" does not describe a motion of the actor or PSA.[1] In (4a), for instance, the actor herself does not move to the place where the speaker is located. What is coming is a ball. Compare this with the use of *kuru* in sentences such as *tomodachi-ga boku-no ie-ni tazune-te ki-ta* (friend-NOM I-GEN home-DAT visit-CONV **come**-PAST) "My friend came to visit my home", which does describe a motion of PSA *tomodachi* "friend" and hence does not qualify as an inverse construction. Since the andative directional verb *iku* "to go" does not function as a direct marker as illustrated in (3), the direct-inverse paradigm consists of the unmarked verb and the verb accompanied by *kuru* "to come".[2]

    The direct-inverse distinction may also be relevant for motions/actions involving two third person participants, if one of the participants is within the speaker's deictic sphere. The use of an inverse form in (5) can be felicitous if the speaker empathizes with *Hanako* who is the recipient of the letter.

(5)   *Taro-wa*   *Hanako-ni* *tegami-o* *kai-te*   **ki**-*ta-rashii.*
       Taro-TOP   Hanako-to letter-ACC write-CONV **come**-PAST-EVID
       'Taro wrote a letter to Hanako (I heard).'

---

1.   The inverse marker *kuru* "to come" does not describe a motion of the undergoer either (see Koga 2006). In the following example, for instance, the undergoer *te* "hand" moved away from, rather than toward, the speaker:

    Hanako-wa   *kyuuni*   (*tsunai-de*   *i-ta*)   *te-o*
    Hanako-TOP   suddenly   (tie-CONV   ASP-PAST) hand-ACC

    hanashi-te   **ki**-*ta.*
    let go-CONV   **come**-PAST

    'Hanako suddenly let go of my hand (she was holding).'

The concrete physical motion sense of the verb *kuru* "to come" is completely bleached in this example.

2.   The term "andative" refers to motion away from the deictic center (Lichtenberk 1991).

Example (5) is reminiscent of the obviation system typically found in some Algonquian languages (Wolfart & Carroll 1981). Thus, *Hanako* can be considered the proximate argument which is more topical in discourse than the obviative *Taro*. It is important to note, however, that the use of *kuru* "to come" illustrated in (5) differs from one in (4) in one crucial way: inverse marking is optional in (5) where only third person participants are involved, but it is obligatory or at least strongly preferred in (4) in which speech act participants (SAPs hereafter) are involved (see Givón 1994 for the distinction between semantic/obligatory and pragmatic/optional inverses).

To recapitulate, the distribution of direct and inverse forms in Japanese is controlled by the following person hierarchy: 1st > 2nd > 3rd, with further ranking among third person participants depending on the working of the speaker's empathy. Direct forms are used when motions/actions originate in the participant higher on the hierarchy, and inverse forms are utilized when they terminate in the participant higher on the hierarchy (Shibatani 2006). The near-obligatoriness of inverse marking in (4) suggests that the phenomena under investigation belong to the domain of the syntax-pragmatics interface, rather than merely of pragmatics. It is certainly to be admitted that the acceptability of the sentences without *-ki* in (4) varies slightly according to speakers, but we assume that the person hierarchy is primary and the context-bound empathy has only marginal effect unless both of the participants are third person.

Shibatani (2003) further observes that the person hierarchy also controls an active-passive distinction in Japanese. The following examples demonstrate that the passive form is called for when the undergoer outranks the actor on the person hierarchy, while the active form is called for when the actor outranks the undergoer on the hierarchy:

(6)   a.   *Boku-wa   Ken-o   nagut-ta.*
           I-TOP   Ken-ACC   hit-PAST
           'I hit Ken.'   (Shibatani 2003: 278)

      b.   *??Ken-wa   boku-ni   nagura-**re**-ta.*
           Ken-TOP   I-by   hit-**PASS**-PAST
           'Ken was hit by me.'   (Shibatani 2006: 252)

(7)   a.   *??Ken-wa   boku-o   nagut-ta.*
           Ken-TOP   I-ACC   hit-PAST
           'Ken hit me.'

      b.   *Boku-wa   Ken-ni   nagura-**re**-ta.*
           I-TOP   Ken-by   hit-**PASS**-PAST
           'I was hit by Ken.'   (Shibatani 2003: 278)

(7a) is acceptable only under limited circumstances, for example when the sentence expresses either sentence-focus or argument-focus, in which case *-ga* would be

preferred instead of *-wa*. And it is generally agreed that (7a) is pragmatically odd under an unmarked predicate-focus interpretation.[3]

Now, an important question arises as to the distribution of passive and inverse forms in Japanese. When is it that one form is selected over the other or that one form is more appropriate than the other? Shibatani's answer to this question is found in the following quote:[4]

> Despite the fundamental difference between the direct-inverse and the active-passive patterning, the two are controlled by the same principle (and possibly in some other languages). That is, *when an action is directed to the speaker's sphere, the passive form is obligatory, just as the inverse form is obligatory when a motion is directed toward the speaker's sphere.*
> (Shibatani 2003: 278; emphasis added)

That is, the passive and the inverse share the function of animacy-based alternative encoding of the predicate-argument relation, and the active-passive distinction is the relevant opposition when an event in question is in the domain of action, whereas the direct-inverse distinction is relevant when an event in question involves either a motion or a transfer of some entity.

2.3   Problems with Shibatani's (2003, 2006) analysis

Shibatani's generalization on the distributional patterns of the two marked "voice" constructions, the inverse and the passive, on the basis of the semantics of the matrix verb, seems quite ingenious. However, further examinations reveal that the division of labor between the inverse and the passive is not as clear-cut as Shibatani notes. For example, there are cases where non-motion verbs can be marked by *kuru* "to come", as in (8):

(8)   *Ken-ga   (ikinari)   boku-o   nagut-te   **ki-ta.***
       Ken-NOM   (suddenly)   I-ACC   hit-CONV   **come-PAST**
       'Ken (suddenly) hit me.'

---

3.   It is important to point out, however, that the obligatoriness of the two marked voice constructions, i.e., the inverse and the passive, is often (but not always) suspended in subordinate clauses. Thus, the phenomena under investigation are largely considered main-clause phenomena.

4.   In other places, Shibatani also argues for the division of labor between the passive and the inverse based on the semantics of the main verb.

> The unifying principle, then, is that when a motion or an action is directed toward the speaker's deictic center, marked constructions obtain: the inverse form for a motion and the passive for an action.   (Shibatani 2003: 279)

> … the active/passive and direct/inverse systems divide the task of indicating the direction of an action with regard to the deictic center. When simple actions are involved, the active/passive opposition is utilized. When an action involves the transfer of some entity … the direct/inverse pattern is invoked.   (Shibatani 2006: 250)

The passive (7b) and the inverse (8) are equally well-formed utterances describing an action directed toward the speaker. Likewise, actions in the following examples (9)–(11) can be rendered either by the passive (as in b-sentences) or by the inverse (as in c-sentences):

(9)   a. *??Ken-wa   boku-o kyoohaku shi-ta.*
          Ken-TOP   I-ACC   threat   do-PAST
          'Ken threatened me.'

       b. *Boku-wa   Ken-ni   kyoohaku sa-**re**-ta.*
          I-TOP   Ken-by   threat   do-**PASS**-PAST
          'I was threatened by Ken.'

       c. *Ken-ga   boku-o kyoohaku shi-te   **ki**-ta.*
          Ken-NOM I-ACC   threat   do-CONV **come**-PAST
          'Ken threatened me.'

(10) a. *Ken-ga   nedan-o   nibai-ni   tsuriage-ta.*
          Ken-NOM price-ACC twice.as.much-to raise-PAST
          'Ken doubled the price.'

       b. *Boku-wa Ken-ni   nedan-o   nibai-ni   tsuriagera-**re**-ta.*
          I-TOP   Ken-by   price-ACC twice.as.much-to raise-**PASS**-PAST
          'I got the priced doubled by Ken.'

       c. *Ken-ga   (*boku-ni) nedan-o   nibai-ni*
          Ken-NOM I-to   price-ACC twice.as.much-to

          *tsuriage-te **ki**-ta.*
          raise-CONV **come**-PAST
          'Ken doubled the price (**on me**).'

(11) a. *Henna   otoko-ga kocchi-o   mi-te   niyaniya   si-ta.*
          weird   man-NOM this way-ACC look-CONV grinningly do-PAST
          'A weird guy looked this way [= where I was] and grinned.'

       b. *Boku-wa henna otoko-ni niyaniya   sa-**re**-te*
          I-TOP   weird   man-by   grinningly   do-**PASS**-CONV

          kibun-ga   warukat-ta.
          feeling-NOM bad-PAST
          'Having been grinned at, I felt bad.'

       c. *Henna   otoko-ga kocchi-o   mi-te   (?boku-ni)*
          weird   man-NOM this way-ACC look-CONV I-to

          *niyaniya   shi-te   **ki**-ta.*
          grinningly do-CONV **come**-PAST
          'A weird guy looked this way [=where I was] and grinned (**at me**).'

One of the problems with Shibatani's analysis of inverse constructions in Japanese lies in his assumption that verbs to which the inverse marker *kuru* "to come" can be

attached are verbs of transfer taking a dative-marked goal/recipient argument, and that the person hierarchy operates on the nominative-marked sender and the dative-marked recipient. When the recipient is the higher ranking participant on the person hierarchy, the inverse form obtains. However, the distribution of the inverse form is, in fact, much wider than what Shibatani assumes, as evidenced by the verbs occurring in examples (8) through (11) (i.e., "to hit" in (8), "to threaten" in (9), "to raise" in (10), and "to grin" in (11)). In (8c) and (9c), the first person participants are accusative-marked patients. Further, with (10c) and (11c), what is particularly remarkable is that *kuru* "to come" can be attached to a predicate even though the first person participant (i.e., the higher ranking participant on person hierarchy) is not an argument of it. The verb in (10) is a two-place predicate which does not take a goal/recipient argument, and that in (11) is a one-place predicate taking no object at all. As will be discussed later, the first person participant in (10) and (11) cannot be realized syntactically as a core argument or is never assigned a macrorole in the inverse construction, though its presence is always implied and assured by the use of *kuru* "to come". Thus *boku-ni* "on me" cannot occur in (10c), but it can be freely realized as the privileged syntactic argument (henceforth PSA) in the adversative passive construction, as in (10b). (11c) is somewhat different, as grinning may be interpreted as having a communicative intent and thus the addressee may be expressed in an oblique case.

These observations cast doubt on the apparent division of labor between the active-passive and the direct-inverse based simply on the semantics of the verb, i.e., whether it involves an action or a motion, is untenable. Instead, we take the following position: When an event, whether it is an action or motion, is directed toward the speaker or the participant that ranks higher on the person hierarchy than the actor, either the passive or the inverse can be used as a non-default argument encoding strategy. The choice of one construction over the other is motivated by a cluster of syntactic, semantic, and pragmatic properties associated with the constructions, rather than by the semantics of the matrix predicate alone. In the next section, we will look closely at the similarities and differences between the passive and inverse constructions.

3.   A closer look at inverse and related constructions in Japanese

3.1   Similarities and differences between inverse and passive constructions in Japanese

Givón (1981) identifies three primary functions of passivization, viz., clausal topic assignment to a non-agent, impersonalization, and detransitivization.[5] The passive

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5.   Impersonalization and detransitivization are roughly equivalent to agent defocusing (Shibatani 1985) and inactivization (Haspelmath 1990), respectively.

and the inverse in Japanese seem to be similar with respect to the first function, namely clausal topic assignment to a non-agent. Yet it is presumably more appropriate to say that both the passive and the inverse signal that the non-actor (Givón's "non-agent") is pragmatically more *salient* than the actor, because the notion of "clausal topic assignment" may prove problematic (cf. Klaiman 1993). This is particularly true when we examine the nature of inverse constructions, a point we come back soon. With respect to the remaining two functions, the passive and the inverse diverge.

Let us first examine impersonalization, i.e., defocusing of an actor. Impersonalization is regarded as a matter of degree: an extreme case of impersonalization is obligatory omission of an actor, while a less radical case is the overt expression of an actor in an oblique case. In either case, the passive "demotes" an actor (which is PSA in an active clause) to a periphery. Thus, the passive in Japanese is characterized as a voice construction involving both PSA modulation and argument modulation (Van Valin & LaPolla 1997; Van Valin 2005). On the other hand, in the inverse construction, an actor retains its status as PSA, and neither an actor nor an undergoer is realized in a non-canonical way within the clause. In other words, the inverse involves no change in grammatical relations, hence no PSA or argument modulation.

The fact that the Japanese passive involves impersonalization while the inverse does not have important consequences. The syntactically "demoted" actor in the passive is characterized as having very low topicality, hence its frequent omission. In contrast, the actor in the inverse is characterized as retaining relatively high topicality, though it is lower than that of the non-actor (Givón 1994). In other words, there are two salient participants in a clause, and the non-actor is more salient, more predictable, and more continually tracked than the actor in a stretch of discourse, i.e., it is more globally topical (Givón 1983). It is not unusual that the clausal topic and the discourse topic do not coincide, and there are cases in which the actor is the clausal topic and the non-actor is the discourse topic occupying the deictic center. The Japanese inverse is precisely such a case, and the presence of *kuru* "to come" assures the high discourse-topicality of the non-actor, making its referent easily identifiable (though, importantly, the *kuru*-inverse can be optionally employed when a PSA is in focus domain).

Next, with respect to detransitivization (or stativization), an event in the passive is stativized with its endpoint foregrounded, typically having a perfective meaning. The shift of focus to the end-state of an event in passives correlates with the reduction of valence by one.[6] By contrast, an event in the inverse is not stativized and the

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6. This characterization does not apply to adversative passives where the *ni*-marked argument has the core argument status, and hence no valence reduction is involved. However, the aspectual characteristic associated with direct or non-adversative passives that we are discussing here is relevant to indirect or adversative passives as well.

clause fully retains transitivity with no valence reduction. Unlike the passive, the se-
mantically transitive event is encoded as syntactically transitive in the inverse, with an
actor taking the status of PSA. As such, the inverse encodes a process as an important
facet of an event. One of the most interesting semantic characteristics of the inverse in
Japanese is its aspectual property. Unlike the passive, which has a strong perfective
flavor, the inverse construction in Japanese indicates an *emergence* of an event toward
the deictic center and thus has an inceptive flavor. This aspectual characteristic appar-
ently derives from the lexical semantics of *kuru* "to come", which is a dynamic verb
denoting a situation where an entity enters the speaker's deictic sphere.

Given these semantic characteristics, it comes as no surprise that in certain cases
the realization of an event can be felicitously cancelled in the inverse construction, as
the following examples show:

(12)　a.　*Ken-wa*　*Taro-o*　　*nagut-ta-kedo*　　　　*umaku*　　*kawashi-ta.*
　　　　　Ken-TOP　Taro-ACC　hit-PAST-CONCESS　well　　　dodge-PAST
　　　　　Intended: 'Ken hit Taro, but he (=Taro) dodged the blow.'

　　　b.　*Boku-wa*　*Ken-ni*　　*nagura-**re**-ta-kedo*　　　*umaku*　　*kawashi-ta.*
　　　　　I-TOP　　　Ken-by　　hit-**PASS**-PAST-CONCESS　well　　　dodge-PAST
　　　　　Intended: 'I was hit by Ken, but I dodged the blow.'

　　　c.　*Ken-ga*　　*nagut-te*　　**ki**-*ta-kedo*　　　　*umaku*　　*kawashi-ta.*
　　　　　Ken-NOM　hit-CONV　　**come**-PAST-CONCESS　well　　　dodge-PAST
　　　　　'Ken hit at me, but I dodged the blow.'

In (12a), an active sentence, the hitting event is successfully completed, and hence its
realization is not defeasible. By the same token, (12b), a passive sentence, is also unac-
ceptable. Thus (12a) and (12b) both indicate that the actor brought about an intended
result upon the undergoer, and their difference is that the former construes the event
from the actor's perspective, while the latter does it from the undergoer's perspective.
But in (12c), an inverse sentence, the result of the hitting event is defeasible, unlike in
(12a) and (12b).[7] The grammaticality of (12c) suggests that the inverse tends to focus
heavily on the initiation of an event, and its outcome may be left out of its profile. Put
differently, the inverse foregrounds an activity component of the event at the expense
of backgrounding an outcome effected by the action.

Correlated with the above fact is another interesting characteristic of the inverse
in Japanese, as illustrated in (13):

7.　As seen from the translation of (12c), the inverse construction in Japanese shows some
affinity to the conative construction in English, whose "emphasis is not on the effect of the
activity" but "on the subject's engaging in the activity." (Dixon 2005: 299)

(13) a. *?Ken-wa   boku-no   ashi-o   {wazato   /ukkari}*
          Ken-NOM   I-GEN   foot-ACC   deliberately /inadvertently

          hun-da.[8]
          step.on-PAST

          'Ken {intentionally/inadvertently} stepped on my foot.'

      b. *Boku-wa   Ken-ni   {wazato   /ukkari}   ashi-o*
          I-TOP   Ken-by   deliberately/inadvertently foot-ACC

          *huma-**re**-ta.*
          step.on-**PASS**-PAST

          'I got my foot stepped on by Ken.'

      c. *Ken-ga   boku-no   ashi-o   {wazato   /*ukkari}*
          Ken-NOM   I-GEN   foot-ACC   deliberately / inadvertently

          *hun-de   **ki**-ta.*
          step.on-PAST   **come**-PAST

          'Ken {intentionally/*inadvertently} stepped on my foot.'

The passive sentence in (13b) can be uttered when Ken stepped on the speaker's foot
either intentionally or inadvertently.[9] On the other hand, the inverse form cannot
cooccur with the adverb *ukkari* "inadvertently" in (13c) which indicates lack of voli-
tionality on the part of the actor. In other words, the actor in the inverse, unlike that
in the passive, must be a volitional agent, rather than a mere effector (Van Valin &
Wilkins 1996). More examples illustrating this point are provided in (14):

(14) a. *?Ken-wa   {wazato   /ayamatte}   boku-no*
          Ken-TOP   deliberately /mistakenly   I-GEN

          huku-ni   koohii-o   koboshi-ta.
          cloth-to   coffee-ACC   spill-PAST

          'Ken {intentionally/inadvertently} spilled the coffee on my cloth.'

8.   Many native speakers of Japanese accept this example, as well as one in (14a). Thus, the
use of the passive or the inverse when an event is directed toward the speaker is not completely
obligatory. The degree of obligatoriness of the passive and inverse varies slightly from one
example to the other. However, the accepted active/direct sentence and its inverse counterpart
differ in important ways. The active sentence allows an interpretation of an event as carried out
either intentionally or unintentionally, while the inverse sentence allows only an intentional in-
terpretation. Moreover, the affectedness of the speaker or the higher-ranking participant on the
person hierarchy is more pronounced in the inverse than in the active/direct sentences.

9.   Passive sentence (13b) is in fact ambiguous. That is, adverbs *wazato* "deliberately" and
ukkari "inadvertently" can make reference to the volitionality either of the undergoer realized as
PSA or of the demoted actor. The ambiguity is resolved if the adverbs are place between the PSA
and the actor, in which case the adverbs indicate the volitionality of the PSA.

b. *Boku-wa*   *Ken-ni*   {*wazato*   /*ayamatte*} *huku-ni*
   I-TOP   Ken-by   deliberately   /mistakenly   cloth-to

koohii-o   *kobosa-**re**-ta.*
coffee-ACC   spill-**PASS**-PAST

'I got coffee spilled on my cloth by Ken.'

c. *Ken-wa*   {*wazato*/   **ayamatte*}   *boku-no*
   Ken-TOP   deliberately/   mistakenly   I-GEN

huku-ni *koohii-o*   *koboshi-te* ***ki**-ta.*
cloth-to   coffee-ACC   spill-CONV   **come**-PAST

'Ken {intentionally/*mistakenly} spilled the coffee on my cloth.'

From these examples, it follows that the PSA of the inverse construction is restricted to the volitional agent of predicates describing intentional actions.

Table 1 summarizes the discussion so far (the similarity is italicized):[10]

Table 1. Differences between the inverse and the passive constructions in Japanese

	Syntax	Semantics	Pragmatics
Inverse	– actor retained as PSA – transitivity retained; no change in valence	– actor always volitional (i.e., agent) – not stativized/ high transitivity – emergence of an event; focus on an initiation or inception of an event	– actor relatively high in saliency – *non-actor higher in saliency than actor*
Passive	– non-actor "promoted" to PSA – actor "demoted" to an oblique – (typically) valence reduces by one	– actor not always volitional – stativized – focus on the end-point of an event; perfective aspect	– actor very low in saliency – *non-actor higher in saliency than actor*

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10.   To simplify, we intend the syntactic characteristics provided in Table 1 to be applied only to so-called *direct* or *neutral* passives (i.e., non-adversative passives), not for adversative passives. For more details, see discussions in Section 3.3.

In order to understand the characteristics of the *kuru* "to come" inverse form in a wider context, we now turn to compare this construction with benefactive constructions in Japanese, which can be regarded as another type of inverse constructions.

3.2   Similarities and differences between *kuru*-inverse and benefactive constructions in Japanese

In Japanese, verbs of giving lexicalize deictic distinctions. Basically, *yaru* describes a giving event directed toward a non-speaker while *kureru* describes a giving event toward the speaker. Examples in (15) illustrate their main verb uses (here too the person and the direction of action are indicated in brackets).[11]

(15) a.   *Watashi-wa Ken-ni   booru-o {**yat**-ta   /***kure**-ta}. [1>3]*
          I-TOP   Ken-to   ball-ACC **give**-PAST / **give**-PAST
          'I gave the ball to Ken.'

      b.   *Ken-ga   watashi-ni booru-o {***yat**-ta   /**kure**-ta}. [3>1]*
          Ken-NOM   I-to   ball-ACC **give**-PAST /**give**-PAST
          'Ken gave me the ball.'

      c.   *Ken-ga   Haknako-ni booru-o {**yat**-ta   /**kure**-ta} [3>3]*
          Ken-NOM   Hanako-to   ball-ACC **give**-PAST /**give**-PAST
          'Ken gave the ball to Hanako.'

In events where a third person gives something to another third person, either *yaru* or *kureru* can be used, depending on which participant the speaker empathizes with. Thus, in (15c), the verb *yaru* is selected if the speaker empathizes with *Ken* whereas *kureru* is selected if the speaker empathizes with *Hanako*.[12] Notice that *yaru* "to give to a non-speaker" and *kureru* "to give to the speaker" are deictically identical with *iku* "to go" and *kuru* "to come", respectively. As evidenced in (15), *yaru* and *kureru* can be regarded as lexicalized direct and inverse markers respectively (cf. Oshima 2007; Shibatani 2003). Like the *kuru*-inverse examined above, the selection of the verbs is determined by the person hierarchy: the *yaru* form is used when the actor outranks the beneficiary/recipient on the person hierarchy, and the *kureru* form is used when the beneficiary/recipient outranks the actor on the hierarchy.

   The verbs of giving also function as benefactive markers in complex predication, and can be analyzed as serving an inverse function: *yaru* "to give to a non-speaker" is used when the action is directed toward a non-speaker (or a lower ranking

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11.   There are others verbs describing a transfer of possession to a non-speaker, *ageru* and *sashiageru*. These verbs are more formal than *yaru* "to give to a non-speaker". There also is a verb whose semantics is identical with *kureru* "to give to the speaker" but differs from it only in terms of formality, viz., *kudasaru*. It is more formal than *kureru*.

12.   This is also reminiscent of the obviation system of Algonquian languages.

participant), and *kureru* "to give to the speaker" when directed toward the speaker (or a higher ranking participant).

(16) a. *Boku-wa Ken-ni booru-o   nage-te   {yat-ta/   *kure-ta}.* [1>3]
          I-TOP   Ken-to ball-ACC throw-CONV **give**-PAST/ **give**-PAST
          'I threw the ball to Ken.'

      b. *Ken-wa   boku-ni booru-o nage-te   {*yat-ta   /kure-ta}.* [3>1]
          Ken-TOP   I-to   ball-ACC throw-CONV **give**-PAST /**give**-PAST
          'Ken threw me the ball.'

Unlike the direct-inverse paradigm using the directional verb, where the inverse *kuru* "to come" is opposed to an unmarked direct form (see (3)–(4)), the direct form in the paradigm based on verbs of giving uses *yaru* "to give to a non-speaker", although it is not obligatory and adds a specific meaning of benefaction.

   The next question is what differences there are between the two inverse markers, *kuru* and *kureru*. In the following example, both forms are equally acceptable:

(17) *Ken-wa   boku-ni booru-o nage-te   {ki-ta   /kure-ta}.*
      Ken-TOP   I-to   ball-ACC throw-CONV **come**-PAST /**give**-PAST
      'Ken threw me the ball.'

But the comparison of (18) and (19) is very telling in teasing apart the differences between the two forms.

(18) *{Tanon-de-mo   i-nai-noni   /Shiri-taku-mo-nai-noni}* …
      ask-CONV-EMPH ASP-NEG-CONCESS /know-want-EMPH-NEG-CONCESS
      '(I) didn't even ask (him)/want to know, but …'

      Ken-ga   denwa   bangoo-o   oshie-te
      Ken-NOM   telephone number-ACC teach-CONV

      {ki-ta   /?kure-ta}.
      come-PAST /**give**-PAST
      'Ken gave me his phone number.'

(19) *Kongan-si-tara* …
      beg-do-CONDIT
      '(I) begged (him), and …'

      Ken-ga   denwa   bangoo-o   oshie-te
      Ken-NOM   telephone number-ACC teach-CONV

      {?ki-ta   /kure-ta}.
      come-PAST /**give**-PAST
      'Ken gave me his phone number.'

In (18), the *kuru* inverse form naturally follows *tanon-de-mo i-nai-noni* "I didn't even ask, but …" or *shiri-taku-mo-nai-noni* "I didn't want to know, but …" while the *kureru* inverse form sounds odd or less natural than the *kuru* inverse form. (19), on the other

hand, shows that the *kuru* inverse form does not naturally follow *kongan-si-tara* "I begged, and …", while the *kureru* inverse does. The different acceptability of these examples reveals the following: an event in the *kuru* "to come" inverse construction is typically *unexpected* to the speaker and often affects the speaker negatively, while that in the *kureru* "to give to the speaker" inverse is always beneficial to the speaker retaining its original meaning and always affects the speaker positively. Based on these observations, we may call the *kuru* inverse as a *neutral/malefactive inverse* and the *kureru* inverse as a *benefactive inverse*.

In contemporary Japanese, the two paradigms are not yet rigidly in opposition, mostly because the malefactive or the adversative meaning associated with the *kuru* inverse construction is in the process of conventionalization. While there seems to be an emerging division of labor between the *kuru* "to come" form and *kureru* "to give to the speaker" within the inverse category, it is far from complete. Thus when the two inverse markers are put together, there may be a semantic clash as in (20), but there are acceptable examples as well, as in (21).

(20) ??*Ken-ga   denwa   bangoo-o   oshie-te   **ki**-te   **kure**-ta.*
      Ken-NOM   telephone number-ACC teach-CONV **come**-CONV **give**-PAST
      'Ken told me his phone number.'

(21) *Ken-ga   denwa-o   shi-te   **ki**-te   **kure**-ta.*
      Ken-NOM   telephone-ACC do-CONV   **come**-CONV **give**-PAST
      'Ken telephoned me.'

It is beyond the scope of this study to provide any specific formulation on this issue. The best we can suggest is that one determining factor may be the conventional schema associated with each verb: When an action is normally carried out to do good to others (such as teaching in (20)), the conflict with the potentially malefactive *kuru* is bigger. When more neutral actions are expressed (such as telephoning in (21)), they are compatible with the neutral interpretation of *kuru*, and can be followed by benefactive *kureru*.

Now let us briefly examine the direct category of the inverse paradigm employing verbs of giving. We have seen that within the inverse category, *kureru* "to give to the speaker" is benefactive and the neutral and malfactive functions are served by the directional verb *kuru* "to come". Within the direct category, the situation is different. Consider (22):

(22) *Boku-wa   asa   hayaku Ken-ni denwa-o   shi-te   **yat**-ta.*
      I-TOP   morning   early   Ken-to telephone-ACC do-CONV   **give**-PAST
      i.   'I telephoned Ken early in the morning (for him).'
      ii. 'I telephoned Ken early in the morning (to negatively affect him).'

As the translations suggest, there are two interpretations to the sentence in (22), the benefactive and malefactive interpretations. In the benefactive interpretation (i), the speaker's telephoning Ken early in the morning is carried out in favor of him, for

example because Ken asked the speaker to do so. In the malefactive interpretation (ii), on the other hand, the speaker carried out the event intentionally to affect Ken negatively.[13] This ambiguity arises because within the direct category the directional verb *iku* "to go" does not function as a direct marker, and the neutral situation is simply expressed by the main verb alone. *Yaru* "to give (to a non-speaker)" has an affective sense but there is no distinction with respect to the ethical consequence of the action, serving the double duty of indicating either benefactive or malefactive meanings.

Table 2 recapitulates the discussion in this subsection ("Neutral" refers to cases devoid of subjective attitudes toward the event, i.e., whether the speaker or the recipient is positively or adversely affected by the event).

Table 2. Direct and inverse categories in Japanese

	Direct category	Inverse category
Neutral	*zero*	*kuru* "to come"
Malefactive	*yaru* "to give to the non-speaker"	
Benefactive		*kureru* "to give to the speaker"

3.3   Differences among passive, inverse, and benefactive constructions with respect to valence

We mentioned briefly in 2.3 that the passive and the *kuru* "to come" inverse constructions differ with respect to their valence. In this subsection, we examine this difference more closely, paying attention to adversative passives (Kuno 1983; Tsuboi 2000).

One of the most striking characteristics of adversative passives in Japanese is the increase, rather than reduction, in valence (see, however, Shibatani 2000 against this position). The *ni*-marked argument in the adversative passive is considered a core argument in terms of such syntactic criteria as an ability to control the reflexive *jibun* "self" (Van Valin & LaPolla 1997: 389–392). Furthermore, as we have seen in (10) and (11) above, the PSA in the adversative passive is not a subcategorized argument of a *verb*. Thus, unlike the usual passive characterized as involving valence reduction, the adversative passive increases valence by one. Shibatani (1994) calls this argument, i.e., one that is not subcategorized for by a verb, an extra-thematic argument, but we would rather call it *extra-thematic participant* to avoid misconstrual.

Against this backdrop, we may claim that the three marked constructions, the adversative passive, the *kuru* "to come" inverse, and the *kureru* "to give to the speaker"

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13.   The use of malefactive *yaru* "to give to a non-speaker" is restricted to events carried out by the speaker (i.e., 1st person) because it indicates the speaker's subjective attitude toward the event, i.e., the speaker's satisfaction with the intended outcome realized upon the recipient.

benefactive/inverse, differ with respect to the way they deal with an extra-thematic participant syntactically.

Consider the following examples in (23) and (24):

(23) a. *Ken-ga*   (*Hanako-ni*)   *doa-o*   *ake-ta.*
          Ken-NOM   (*Hanako-to)   door-ACC   open-PAST
          'Ken opened the door.'

      b. *Boku-wa Ken-ni   doa-o   akera-**re**-ta.*
          I-TOP   Ken-by   door-ACC   open-**PASS**-PAST
          'I got the door opened by Ken.'

      c. *Samui-noni   Ken-ga   (*boku-ni*)   doa-o*
          cold-CONCESS   Ken-NOM   (I-to)   door-ACC

          *ake-te   **ki**-ta.*
          open-CONV   **come**-PAST

          'I was very cold, but Ken opened the door.'

      d. *Ken-ga   boku-ni   doa-o   ake-te   **kure**-ta.*
          Ken-NOM   I-to   door-ACC   open-CONV   **give**-PAST
          'Ken opened the door for me.'

(24) a. *Ken-ga   (*Hanako-ni*)   gachaanto   denwa-o   kit-ta.*
          Ken-NOM   (*Hanako-to)   MIMETICS   telephone-ACC   hang.up-PAST
          'Ken hung up the phone.'

      b. *Boku-wa Ken-ni   denwa-o   gachaanto   kira-**re**-ta.*
          I-TOP   Ken-by   phone-ACC   MIMETICS   hang.up-**PASS**-PAST
          'I got the phone hung up on me by Ken.'

      c. *Ken-ga   (*boku-ni*)   denwa-o   gachaanto kit-te   **ki**-ta.*
          Ken-NOM   (*I-to)   phone-ACC   MIMETICS hang.up-CONV   **come**-PAST
          'Ken hung up (**on me**).'

      d. *Ken-ga   (*boku-ni*)   denwa-o   gachaanto kit-te   **kure**-ta.*
          Ken-NOM   (*I-to)   phone-ACC   MIMETICS hang.up-CONV   **give**-PAST
          'Ken hung up (**for me**).'

Both *akeru* "to open" and *kiru* "to hang up" are two-place predicates which do not take a *ni*-marked argument, as seen in (23a) and (24a). (23b) and (24b) show that the adversative passive freely introduces a PSA which is the first person extra-thematic participant adversely affected by the event, and hence involves increase in valence by one. This is so because the adversative passive involves no "demotion" of arguments, as mentioned above. By contrast, the syntactic realization of an extra-thematic participant is not allowed in the *kuru* "to come" inverse construction, as witnessed in (23c) and (24c). The *kuru* inverse form never involves either promotion or demotion of arguments. Tuning to examples of the *kureru* "to give to the speaker" inverse construction, we observe that

the extra-thematic participant surfaces as the *ni*-marked argument in (23d), while it does not in (24d). Thus, the syntactic realization of an extra-thematic participant in the *kureru* inverse construction varies depending on the matrix predicate.[14] As pointed out above, although an extra-thematic participant affected by the event is not allowed to figure as a syntactic core argument in the *kuru* "to come" or *kureru* "to give to the speaker" inverse constructions, its presence is always assured by the presence of these deictic verbs. The implication that the participant who ranks higher on the person hierarchy is affected by the event derives from the function of the deictic verbs indicating motion (concrete or abstract) toward the deictic center.

On the basis of these observations, we may make the following generalizations. The adversative passive, the *kuru* "to come" inverse, and *kureru* "to give to the speaker" benefactive/inverse constructions all introduce an extra-thematic participant conceptually, but adopt different encoding strategies for it. The adversative passive freely "promotes" a conceptually licensed extra-thematic participant to a syntactic argument (i.e., PSA), while the *kuru* inverse construction does not realize an extra-thematic participant as a *ni*-argument, but leaves it as an implicit, syntactically unrealized participant. The *kureru* benefactive inverse construction lies in between. That is, it either permits or prohibits the syntactic realization of an extra-thematic participant, depending on predicate type. The examination of an exact reason for this differential behavior between the latter two types of inverse constructions must certainly await another study.

From a yet broader perspective, the primary function of the inverse constructions in Japanese may be considered as a means to reconcile two equally important pragmatic constraints, namely sentence-bound information organization and empathy-based saliency (as expressed in the form of person hierarchy). Under default circumstances, the actor of a transitive predicate is encoded as PSA, and it is typically understood both as a sentence topic and the locus of empathy. The passive is used when the undergoer or some affected person needs to be encoded as topic to maintain topic continuity and is at the same time the locus of empathy (i.e., is ranked higher than the actor on the person hierarchy). In this case, the PSA-topic-empathy trinity is still intact. But there are circumstances in which empathy is not placed on the PSA of the clause for a variety of reasons. One possibility is that the topic continuity requirement in a clause chain overrides the need to topicalize a locus of empathy and thus there are two salient participants in a clause. In such a case, the only available strategy for marking the locus of empathy is to resort to inverse constructions. That is, by explicitly setting up a deictic center using *kuru* "to come" or *kureru* "to give to the speaker", the speaker is able to express that the action is directed to him/her, against the "natural" flow of the course of events while retaining the PSA and topical status of the actor.

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14.   See Shibatani (1996) for detailed discussions on the range of predicates which allow the realization of an extra-thematic argument as a dative argument in benefactive constructions.

4.   Summary and conclusion

Thus far, we have explored the various facets of the inverse and related constructions in Japanese. The syntactic, semantic, and pragmatic properties associated with the *kuru* "to come" inverse construction are summarized in (25), which can be readily put into an RRG-style constructional template:

(25)   The syntactic, semantic, and pragmatic properties of the *kuru* 'come' inverse construction

   a.   Syntax
   - Actor as PSA, no modulation of grammatical relations
   - No reduction in valence
   - 1st person which is not an argument of the verb never realized syntactically as a core argument

   b.   Semantics
   - Profiling a process or action itself rather than an endpoint or end-state of an event, i.e., inceptive (more broadly imperfective), rather than perfective flavor
   - Describing emergence of an event toward the speaker's deictic sphere
   - PSA restricted to volitional actor (i.e., agent)
   - Implication of malefactivity; the speaker (or higher ranking participant) negatively affected[15]

   c.   Pragmatics
   - Non-actor more globally topical or ontologically more salient than actor
   - Actor retaining relatively high topicality, much higher than actor in passive

In discussing the inverse phenomena in Japanese, we have adopted the RRG notions of PSA and core-/non-core arguments. Indeed, the crucial properties of the inverse construction (both in Japanese and in other languages with more canonical inverse constructions) can only be captured by a grammatical framework with a richly articulated mechanism for argument encoding, which RRG well qualifies as. At the same time, we have provided a set of data which would enrich the typology of PSAs hitherto proposed within RRG.

Typologically, Japanese appears to be an interesting case where two kinds of pragmatic influence is operative in syntax (cf. Van Valin 2005: 105). English syntax is highly

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15.   The malefactivity associated with the *kuru* "to come" inverse construction may be included under the pragmatic characteristics of the construction, since its semanticization is not complete, and there are cases where the malefactive sense does not arise.

sensitive to the requirement from clause-bound information organization (hence its heavy reliance on passives), but does not seem to grammaticize any person-based constraint. In languages with canonical inverse constructions (say Algonquian languages), the non-local person-based constraint is the primary determinant of argument encoding, and ordinary notion of topicality (which is local) plays little role. In Japanese, the active-passive paradigm is primarily under the pragmatic influence of clause-bound information organization, and usually the person-based constraint is satisfied simultaneously. But when the PSA-topic-empathy trinity falls apart, the person hierarchy becomes operative in its own right, and the direct-inverse paradigm is called upon. In this sense, besides the fact that they originate in deictic verbs, the inverse constructions in Japanese add yet another bunch of data and more insight to the growing body of studies on inverse phenomena (Payne 1994). Also, the findings in this study are expected to shed a new light on the system of argument encoding in Japanese and to contribute to a more systematic treatment of voice-related phenomena in general.

Abbreviations

ACC	accusative	NEG	negator
ASP	aspect	NOM	nominative
CONCESS	concessive	PASS	passive
CONDIT	conditional	PAST	past
CONV	converb	PL	plural
EMPH	emphatic particle	SG	singular
EVID	evidential	TOP	topic
GEN	genitive	TR	transitivizer

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Transitivity in Kabardian

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In traditional grammars of Kabardian, transitive and intransitive verbs are represented as having different rules of case assignment, as well as different order of personal prefixes. This paper shows how both case assignment and order of verbal prefixes can be accounted for by an elegant set of rules within the framework of Role and Reference Grammar (RRG). It is also shown that in Kabardian, a large majority of transitive verbs are formed by lexical rules or morphological causativization from basic intransitives, and it is argued that there is a systematic correlation between Aktionsart and transitivity: intransitives are, as a rule, activity verbs, while their transitive correlates are active accomplishments.

Cette singularité (ergatif) tient, en gros, à ce que, là où nous pensons "je vois le livre", les Caucasiens pensent quelque chose comme "à-moi le-livre (il-m') est-en-vue" (G. Dumézil, cit. in Paris 1969: 159).

1. Introduction

Kabardian[1] is a NW Caucasian language spoken chiefly in the Kabardino-Balkar Republic in Russia. It has more than 400 000 speakers, and it is written in a modified Cyrillic script. It is an ergative head-marking language with a very complex verbal morphology, and very little nominal morphology. In this paper, I will offer a RRG account of case marking and verb agreement in Kabardian. It will be argued that this account is much simpler than the alternatives offered in traditional grammars,[2] or in the few works that examined the Kabardian verbal system from a more recent theoretical perspective.[3] We shall also discuss how the distinction of transitive and intransitive

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2. E.g., Abitov *et alii* (1957); Kardanov (1957); Šagirov (1967); Černý (1968); Paris (1969); Kumaxov (1971).

3. E.g., Colarusso (1992); Catford (1975); Kumaxov & Vamling (1998); Hewitt (2005); Kumaxov & Vamling (2006).

verbs is realized in Kabardian, and point out why this feature of Kabardian grammar deserves attention of linguists working with RRG, and of typologists in general.

2.   The traditional account of clause structure

Verbs with two arguments in their logical form have one of the two following constructions:

A: intransitive

(1)   *(wa sa)   wə-qʼa-zə-wa*
      you I   2SG-dir.-1SG-hit
      'You hit me'[4]

(2)   *(sa wa)   sə-b-aw-bza*
      I   you   1SG-2SG-PRES.-cut
      'I cut you'

B: transitive

(3)   *(sa wa)   wə-s-ɬāġ̌ᵒ-ā-ś*
      (I   you) 2SG-1SG-see-PRET.-AF.
      'I saw you'

(4)   *w-ay-s-t-ā-ś*
      2SG.-3SG-1SG-give-PRET.-AF.
      'I gave him to you'

(5)   *ābə   syə   txəɬ-ər   0-yə-h-ā-ś*
      he-ERG   1SG.POSS   book-NOM   3SG-3SG-carry.away-PRET.-AF.
      'He carried away my book'

In traditional grammars,[5] it is stated that the first construction is intransitive, and the second transitive. The personal prefixes of the verb in the intransitive construction indeed have the same form as the personal prefixes in typical intransitive verbs taking only one argument, e.g., "sit", or "sleep". It is also claimed that the transitive and the

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4.   The principles of transliteration from the Kabardian Cyrillic employed in this article are explained in my "Kabardian Grammar", available at my website (http://www.ffzg.hr/~rmatasov). They are essentially the same as the standard transliteration rules for Caucasian languages, as explained by J. Gippert in his *Caucasian Alphabet Systems Based Upon the Cyrillic script* (http://titus.uni-frankfurt.de/didact/caucasus/kaukschr.pdf). The major differences are: (1) glottalized consonants are transliterated as C' rather than C̣. (2) the palatal glide is transliterated as *y*, rather than *j*.

5.   E.g., Kardanov (1957); Kumaxov (1989); Kumaxov (ed.) (2006).

intransitive constructions have different case-marking patterns, and different order of personal prefixes on the verb:

a.   In the intransitive construction, the subject is marked with the Nominative[6] case (-*r*), and the (indirect) object with the Ergative/Oblique case (-*m*). The order of personal prefixes is 1. Subject; 2. (Indirect) object:

(6)   *ś'āla-r   txəł-əm   0-y-aw-dža*
       boy-NOM   book-ERG   3SG.-3SG.-PRES.-read
       'the boy is reading the book'

(7)   *sə-w-aw-pł* 'I see you'
       1SG.-2SG.-PRES.-see

b.   In the transitive construction, the subject is marked with the Ergative/Oblique case, and the direct object with the Nominative case; the indirect object, if there is one, gets the Ergative/Oblique case as well. The order of personal prefixes is 1. Direct object; 2. Indirect object; 3. Subject:

(8)   *ś'āla-m   txəł-ər   0-ya-dž*
       boy-ERG   book-NOM   3SG.-3SG.-read
       'The boy reads the book (thoroughly)'

(9)   *(sa wa)   wə-s-łāġo-ā-ś* 'I saw you'
       1SG. 2SG.   2SG.-1SG.-see-PRET.-AF.

(10)   *w-ay-s-t-ā-ś* 'I gave you to him'
        2SG.-3SG.-1SG.-give-PRET.-AF.

Both the rules for verb agreement, and the case assignment rules, as stated in the traditional grammars, seem highly complicated. Surely a simplified account would be welcome.

Since some verbs taking two arguments (e.g., *džən* "read") can be used in both the transitive and in the intransitive constructions, some linguists have suggested that the intransitive construction is actually antipassive.[7] In the antipassive construction, the direct object of the corresponding active is demoted to the status of indirect object, or removed from the core of the clause, and the subject of the corresponding active is treated as the direct object (it gets the absolute, viz. nominative case marking).

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6.   The term "Nominative" is traditionally used in Kabardian grammars. "Absolutive" would be more appropriate from the typological point of view.

7.   E.g., Catford (1975). This analysis is accepted by Colarusso (1992) and Van Valin & LaPolla (1997: 124).

However, the Kabardian intransitive construction is unlike typical antipassives, because:[8]

–   the prefix expressing the patient is not removed from the verbal complex in the intransitive construction (except in the 3rd person). Rather, it is still obligatorily marked on the verb as indirect object; in antipassives, the patients (undergoers of transitive verbs) are typically removed from the core of the clause.

–   the intransitive construction is not morphologically or syntactically marked with respect to the transitive construction, which is the default with antipassive constructions.

–   there are many intransitive verbs with the valency of 2 which do not have the corresponding transitive construction, e.g., *płan* "see", or *wan* "hit". Likewise, there are some transitive verbs that do not have the corresponding intransitive construction, e.g., *hən* "carry", *šan* "lead", or *łāġᵒən* "see".

When there is alternation between transitive and intransitive forms of the verb built from the same root, there is usually a difference in meaning, too.[9] Partly for this reason, Kabardian grammars treat such transitive and intransitive forms as belonging to different verbs (i.e., to different lexical entries). Usually the form ending in *-ə* is transitive, while the form ending in *-a* is intransitive, e.g., However, this correlation is not absolute, so for example *pətə-n* "hang" ends in *-ə*, but it is an intransitive verb (there are many other such examples).

There is, however, a handful of underived transitive verbs, such as *hən* "carry", *zən* "sift", *yən* "smear", and *pxən* "tie"; these verbs do not have intransitive pairs (*han, *zan, etc.), but they are rather few in number.

3.   A new proposal

Let us try to formulate the rules for the order of agreement prefixes more economically. In the transitive construction, in RRG terms, the order is:

Undergoer-non-MR core argument-Actor

In the intransitive construction, the order is:

The only macrorole argument – non-MR core argument

That is, the verbal complex has three prefix positions:[10]

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8.   For a cross-linguistic definition of the antipassive see Dixon & Aikhenvald (1997).

9.   This is another reason why one should not treat the intransitives as antipassives, since valence-changing operations (grammatical voice) do not change the meaning of verbs to which they are applied. On the differences in meaning between transitive and intransitive verbs from the same verbal root see below.

10.   Actually, the number of personal prefix positions is larger, because oblique arguments can also be coded on the verb, but this is not relevant for our present discussion.

1: the lowest ranking macrorole argument 2: non-macrorole direct core argument;
3: Actor.

The position (1) is filled by the personal index that is coreferent with the lowest ranking
macrorole argument of the verb. In the intransitive construction, it will be either the
actor, or the undergoer (the only macrorole), while in the transitive construction, it
will be the undergoer. The position (3) will remain unfilled in the intransitive con-
struction, in which there is only one macrorole. The RRG analysis thus allows us to
formulate a single rule to account for verb agreement in both transitive and intransi-
tive constructions.

Let us analyze the following sentences with this structure in mind:

(11)   *w-ay-s-t-ā-ś*   'I gave you to him'
       2SG.-3SG.-1SG.-give-PRET.-AF.

The marker *-w-* is in the first prefix slot, the slot of the lowest ranking macrorole,
since it is the undergoer; the 3SG. marker *-ay-* is in the second slot, that of the non-
macrorole direct core argument; and, finally, the 1SG. marker *-s-* is in the third slot,
that of the actor:

1 Undergoer	2 Non-MR Arg.	3 Actor Verbal stem
↑	↑	↗ ↗
w	*ay*	*s* *-tāś*
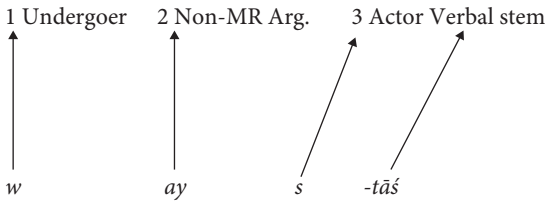
(12)   *sə-w-aw-pł*   'I see you, I'm looking at you'
       1SG.-2SG. -PRES.-see

Here, the first slot is filled by the marker of the lowest macrorole argument, which is
also the only macrorole, namely the 1SG. marker *sə-*; the second position is filled by
the 2SG. marker *-w-*, which is the direct core argument, but not a macrorole, because
the verb *płan* is intransitive. Finally, for the very same reason the third slot (that of the
actor) remains unfilled:

1 Only MR	2 Non-MR-Arg. 3 (Actor)	Verbal stem
↑	↑	↗
sə	*w*	*-awpł*
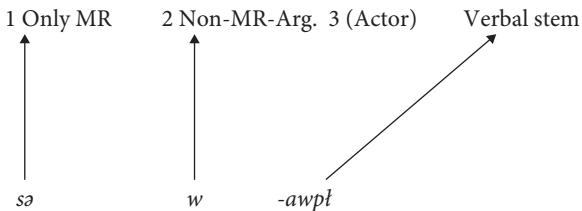
A similar set of rules will take care of the case assignment:

1. The lowest ranking macrorole in the clause is marked with the Nominative (*-r*);
2. All other core arguments are marked with the Ergative/Oblique (*-m*).

Here is how these rules would work for transitive and intransitive verbs, respectively:

1. If the verb is transitive:
   a. assign the Nominative to the lowest ranking macrorole argument
   b. assign the Ergative/Oblique to the other macrorole argument
   c. assign the Ergative/Oblique to the non-macrorole direct core argument(s)

2. If the verb is intransitive:
   a. assign the Nominative to the only macrorole argument
   b. assign the Ergative/Oblique to the non-macrorole direct core argument(s)

We can test if these rules are correct by looking at causatives in Kabardian. The causative is formed with the prefix *-ġa-*, and it is used to derive transitive verbs from intransitives, as well as ditransitive verbs from transitives:

(13) *ł'ə-m*   *fəzə-m*   *txəł-xa-r*   *pśāśə-m*   *0-yə-rə-rəy-ġa-t-xa*
      man   woman   books   girl   3.-3sg.-3sg.-3sg.-CAUS.-give-PL.
      ERG   ERG   NOM   ERG
      'The man makes the woman give the books to the girl'

(14) *ł'əźə-m*   *ś'āl-m*   *χədžabzə-r*   *yə-r-yə-ġa-h-ā-ś*
      old man-ERG boy-ERG girl-NOM   3sg.-3sg.-3.sg.-CAUS.-carry-PRET.-AF.
      'The old man made the boy carry the girl'

In the first example, the noun *txəłxar* "books" is the lowest-ranking macrorole, Undergoer, and so gets the NOM by (1a); other nouns get ERG by the rules (1b) and (1c). In the second example, likewise, the girl (*χədžabzər*) is the lowest-ranking macrorole, and so it gets the NOM, while the other nouns are marked by ERG. The case assignment in causatives thus seems to work just as the theory would predict. However, let us look at the following example:[11]

(15) *yaġadžāk'ᵒa-m*   *yadžāk'ᵒa-r wəsa-m*   *q'-rə-y-ġa-dž-ā-ś*
      teacher-ERG   pupil-NOM poem-ERG   dir.-3sg.-3sg.-CAUS.-read-PRET.-AF.
      'The teacher made the pupil read the poem'

Why is *yadžāk'ᵒa* "pupil" marked with the Nominative in this example, rather than *wəsa* "poem", which is the lowest-ranking macrorole of the verb? The answer is that the

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underlying verb *džan* "read", to which the causative prefix *ġa-* is applied, is intransitive, and the macrorole assignment of this verb is preserved in the causative construction, therefore its only macrorole is in the Nominative. If the underlying non-causative verb is transitive, like *hən* "carry", then *its* lowest ranking macrorole (*χədžabzə-r* in (14)) gets the Nominative (by 1a), while the causee of the causative construction is in the Ergative/Oblique case (by 1b), because it is the other macrorole. The causer is always in the Ergative/Oblique case, because the derived causative verb is transitive. If we consider causatives as complex constructions involving nuclear juncture, it appears that in Kabardian the two nuclei remain independent with respect to case assignment to their arguments. What is typologically unusual is that the argument structure of the subordinated nucleus (the underlying verb) determines the macrorole assignment of the derived, main (causative) verb. Yet, as we shall see in the next paragraph, in other types of juncture in Kabardian, it is the dependent verb that can determine the case of the argument it shares with the main verb. Although typologically unusual, Kabardian seems to be consistent with respect to case assignment.

The following examples involve core cosubordination with the verb *xᵒayən* "want":

(16) *ś'āla-r   k'ᵒa-nwə   0–0-xᵒay-āt*
      boy-NOM   go-INF.   3SG.-3SG.-want-IMPF.
      'The boy wanted to go'

(17) *ś'āla-m   χədžabzə-r   0-yə-łāġᵒa-nwə   0–0-xᵒay-āt*
      boy-ERG   girl-NOM   3SG.- 3SG.-see-INF. 3SG.-3SG.-want-IMPF.
      'The boy wanted to see the girl'

(18) *ś'āla-r   χədžabzə-m   yawa-nwə   0–0-xᵒay-āt*
      boy-NOM   girl-ERG   hit-INF.   3SG.-3SG.-want-IMPF.
      'The boy wanted to hit the girl'

All of the preceding examples involve the control construction, which is realized as a core juncture. The matrix verb *xᵒayən* "want" is intransitive, cp. *ś'āla-r txəł xᵒayāt* "the boy wanted a book", with the subject *ś'āla* "boy" in the Nominative, which is expected with an intransitive verb:[12] the linked verb *łāġᵒən* "to see" (in 17), however, is transitive, and the subject of the verb *xᵒayən* in that example is in the Ergative/Oblique. What transpires from the adduced examples is that only the argument structure of the linked verb is relevant for case assignment; if the linked verb is (M-)intransitive (e.g., *k'ᵒan* "go", *yawan* "hit"), its only argument will be the single macrorole, and hence in the Nominative case; if it is transitive (*łāġᵒən* "see"), its lowest ranking macrorole argument will be in the Nominative case. The macrorole status of the arguments of the dependent verb is preserved in the main core, hence the single argument of the verb

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12. For the syntactic constructions this verb can occur in, see Kumaxov & Vamling (1998: 189–192).

in the matirx core will get the case of the argument of the verb in the linked core it is coreferent with. Therefore, both the argument marked with the Ergative/Oblique and the one marked with the Nominative can be the "subject" (the only M-argument) of the intransitive matrix verb *xʷayən* "want". To test this hypothesis, let's take another transitive verb, *hən* "carry", and put it into the dependent core:

(19)   *ś'āla-m*   *txələ-r*   *yə-hə-nwə*   *xʷay-ā-ś*
     boy-ERG   book-NOM   3SG.-carry-INF.   want-PRET.-AF.
     'The boy wanted to carry the book'

As we see from the example above, *śāla* gets the Ergative/Oblique because it is the Actor of the *linked* verb (*hən*), not the Nominative, because it is the subject of the matrix verb *xʷayən*. This is parallel to the case marking pattern we saw above with the causatives, which we interpreted as involving nuclear juncture. In both types of junctures, then, Kabardian marks the argument of the main clause with the unexpected case. This may have something to do with the fact that Kabardian is, like other NW Caucasian languages, rather consistently head-marking.[13]

As Robert D. Van Valin, Jr. points out to me (p.c.), another important issue here is the domain of case assignment. In English, as well as in Kabardian, the domain of case assignment is the clause, rather than two separate cores as, e.g., in Icelandic.[14] In English, which is an accusative language, only one NP in the whole clause can be the highest ranking macrorole, and get the Nominative case, and this is the subject of the matrix verb. All other NPs in the clause get the case of the other macrorole argument, which is the Accusative. In the ergative language Kabardian, on the other hand, only one NP in the core can be the lowest ranking macrorole, and get the Nominative case. This will be the subject (the lowest ranking MR argument) of the linked verb. Other NPs, including the subject of the matrix verb, will get the Ergative/Oblique case, except in the case when the subject of the matrix verb is coreferent with the subject of the linked verb in the Nominative. In Kabardian, in contrast to English, the case assignment rules first check the argument structure of the linked verb, and then the argument structure of the matrix verb of the clause. The case assigned to the arguments of the linked verb is then assigned to the co-referent argument of the matrix verb.[15]

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13.   For the typological parameter of Head- vs. Dependent-marking see Nichols (1992).

14.   For examples showing that case assignment in Icelandic applies to separate cores, rather than to the whole clause, see Van Valin & LaPolla (1997: 568–581). See also Van Valin (2005: 241–243).

15.   Similar, "dependent first" strategies of case-assignment seem to exist in other ergative languages, e.g., Enga and Newari (for examples, see Van Valin & LaPolla 1997: 580). However, this typological parameter (head first/dependent first) is not necessarily related to case marking. In the NE Caucasian language Tsez (Polinsky & Potsdam 2002) there is a construction, in which the verb in the main clause shows unexpected gender agreement with the argument it shares

4.   Typological and theoretical implications

Some traits of Kabardian morphosyntax that might appear unusual at first sight are not so surprising after all:

1.   There is a homonymy of case endings, because the marker *-m* marks both the Ergative and the Oblique, i.e., both the actor of transitive verbs and the indirect core arguments; however, such a homonymy is rather common. The Ergative case is used to mark other semantic roles (besides the actor of transitive verbs) in many ergative languages (e.g., in Dyirbal).
2.   Kabardian does not have any voice operations (no passive or antipassive), but such languages are also well-attested, e.g., Lakhota.

However, Kabardian is indeed typologically unusual in the following respects:

1.   A number of verbs with the semantic valence of 2 have only one macrorole (i.e., they are M-intransitive),[16] whereas verbs with the same meaning are otherwise treated as transitives cross-linguistically. Verbs meaning "hit", "catch", "eat", "kiss", "lick", "wait", "want", "move", "call", "ask", "catch", "touch", and "do" can all be (M-) intransitive in Kabardian.[17] In my opinion, this means that the usual remedy applied by RRG for treating verbs with quirky transitivity – specifying the exceptional M-transitivity (in terms of the number of macroroles) in the lexical entry – is difficult to apply in this language, because it appears that M-transitivity would have to be specified for each verb in the language. Unlike in most other languages, M-transitivity is not really predictable from the logical structure of the verb in Kabardian. At least in some cases, it appears that the intransitive member of the pair of semantically bivalent verbs differing in transitivity is an activity verb, whereas the transitive member of the pair is an active accomplishment verb. This is especially easy to see with the verbs of consuming, e.g., *šxan* "eat" (intransitive) vs. *šxən* "eat" (transitive). The intransitive verb, *šxan*, cannot be used with the adverbial phrase *qʾāna śəmәʔaw* "completely, thoroughly", which indicates that it is an activity verb; on the other hand, the transitive member of the pair, *šxən*, can be freely

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with the verb in the dependent clause. Maybe both the Kabardian and the Tsez constructions could be subsumed under the notion of "backward control" (Polinsky & Potsdam 2002, 2006), which may be an areal feature of the languages of the Caucasus. This possibility will be investigated elsewhere.

16.   The distinction between (syntactic) transitivity and M-transitivity is not useful in Kabardian, since in that language all NPs expressing core arguments can be ommitted. In this sense, there are no syntactically transitive verbs in the language.

17.   Cp. Klimov (ed.) (1978: 59) for another list of such verbs and a comparison with similar intransitive constructions in other Caucasian languages.

used with that adverbial phrase.[18] The transitives are therefore likely to be active accomplishments. Apart from the verbs of consuming, it appears that the opposition of activities and active accomplishments plays a role in other pairs of transitives and intransitives; namely, the intransitive members of the pair often denote an uncompleted action or activity, whereas the transitive members of the pair imply that the action has been completed, or thoroughly performed:

(20)   *xa-m*   *q'ᵒəpšxa-r*   *yə-dzaq'a(r)*
       dog-ERG   bone-NOM   3SG.-gnaw
       'The dog is gnawing the bone (to the marrow)'

(21)   *xa-r*   *q'ᵒəpšxa-m*   *y-aw-dzaq'a(r)*
       dog-NOM   bone-ERG   3SG.-PRES.-gnaw
       'The dog is gnawing at the bone'

(22)   *ś'āla-r*   *txəł-əm*   *y-aw-dža* – intransitive verb
       boy-NOM   book-ERG   3SG.-PRES.-read
       'The boy is reading the book'

(23)   *ś'āla-m*   *txəł-ər*   *ya-dž*
       boy-ERG   book-NOM   3SG.-read – transitive verb
       'The boy is reading the book (to the end)'[19]

(24)   *pxāśa-r*   *pxa-m*   *yə-xᵒa* – intransitive verb
       carpenter-NOM   plank-ERG   3SG-set
       'The carpenter is setting the planks'

(25)   *pxāśa-m*   *pxa-r*   *yə-xᵒa* – transitive verb
       carpenter-ERG   plank-NOM   3SG.-set
       'The carpenter is setting the planks'

The implication of the sentence (27) is that the carpenter is going to finish setting the planks, whereas there is no such implication in (26).[20]

As can be gathered from the examples above, there is a correlation of transitivity and telicity of the action, and, likewise, there is a correlation of intransitivity with atelicity of the action. Here one must recall that activities are atelic, whereas active accomplishments are telic, and this is reflected in the lexical decomposition of these two Aktionsarten. If our analysis of the examples above is correct, Kabardian would be a language in which the difference of two Aktionsarten (activities vs. active accomplishments) is systematically reflected as a difference in M-transitivity, which is a

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18.   I have checked this with my informants for a dozen verbs, and the rule seems to hold without exception.

19.   My informants tell me that this sentence can also mean "the boy is studying the book".

20.   See Kumaxov (1971), cp. also Kumaxov & Vamling (2006: 10–14).

prediction of RRG.[21] Moreover, this difference in Kabardian seems to be expressed overtly in the morphosyntax of the two main verb classes. However, this is just a working hypothesis in need of further substantiation.

2.   Another typological peculiarity of Kabardian is that verbs are rendered intransitive when the potential prefix is added.[22] The potential prefix (-*xʷə*-) expresses the subject's ability to perform an action.

    (26)   *w-ya-s-tə-r-q'əm*
           2sg.-3sg.-1sg.-give-pres.-neg.
           'I do not give you to him'

    (27)   *wə-s-xʷə-ya-tə-r-q'əm*
           2sg.-1sg.-pot.-3sg.-give-pres.-neg.
           'I cannot give you to him'

In (26), the verb (*tən* "give") is transitive, so the 1sg. Actor prefix (-*s*-) is in the slot next to the verbal root. In (27), on the other hand, the verb is rendered intransitive by the adding of the potential prefix (-*xʷə*-), so the prefix of the 1sg. now indexes the non-macrorole core argument, and is separated from the root by the potential prefix and the 3sg. prefix (-*ya*-). In RRG, affixes expressing the subject's ability to perform an action should be treated as modality operators,[23] and operators generally do not change the argument structure of the verb. In Kabardian, it appears that this is what the potential prefix -*xʷə*- does. It could be argued, perhaps, that this prefix also has an Aktionsart-changing function, i.e., that it changes non-state predicates (activities, accomplishments, etc.) into state predicates, which are, as a rule, intransitive in Kabardian. Doing something may be an action, or an accomplishment, but being able to do something is rather a state, the participants of which are unaffected by the corresponding action. For example, if *Bill* is affected by hitting in the sentence *John hits Bill*, he is unaffected in *John is able to hit Bill*, and this seems to be the logic behind the intransitivizing function of the Kabardian potential prefix -*xʷə*-. If this analysis is correct, it only supports our thesis that transitivity is closely connected to Aktionsart in Kabardian.

3.   There are very few underived transitive verbs in Kabardian; nearly all transitives are derived from intransitives by adding the causative suffix -*ġa*-, or from inherently neither transitive nor intransitive roots by adding the transitivizing suffix -*ə*-, as in the pairs *dan* "to sew at, to be involved in sewing" vs. *dən* "to sew", or *k'ʷan* "go" vs. *k'ʷən*

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21.   See Van Valin & LaPolla (1997: 153); Van Valin (2005: 63–64).

22.   Cp. Kumaxov (ed.) (2006: 257).
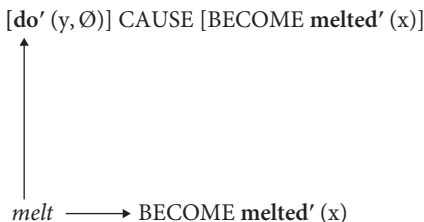
23.   Cp., e.g., Van Valin (2005: 9).

"to pass",[24] or *šxan* "eat at" vs. *šxən* "eat", *ľan* "die" vs. *ľən* "kill", *thaŝan* vs. *thaŝʼən* "wash", *bzan* vs. *bzən* "cut", *than* vs. *thən* "read", *ŝəpan* vs. *ŝəpən* "collect",[25] etc.

There is, however, a handful of underived transitive verbs, such as *hən* "carry", *zən* "sift", *yən* "smear", and *pxən* "tie"; these verbs do not appear to have intransitive pairs (*han, *zan, etc.), but they are rather few in number.

In RRG, the transitivity of a verb can be determined by looking at its logical form; if the default principles are overridden, one has to specify the macrorole transitivity (the number of macroroles a verb takes) separately. However, it is claimed that the number of verbs with exceptional M-transitivity is always rather limited.

Van Valin (2005: 47) assumes that verbs differing in M-transitivity can be derived from each other by lexical rules; this is how the systematic relationship between activities (e.g., *drink beer*) and active acomplishments (e.g., *drink two beers*) in English is captured. Van Valin (2005: 47) also claims that "it is not necessarily the case that there is a single logical structure underlying all of the uses of a particular verbal lexical item". But, if this is so, one wonders what part of the logical structure is actually stored in the lexicon, and what part of it can be derived by lexical rules. It is also argued (Van Valin 2005: 47) that detransitivizing affixes, e.g., in Slavic and Romance, are used to *cancel* parts of logical structure of verbs, namely the CAUSE logical operator. Thus, the causative Croatian verb *topiti* "melt" becomes intransitive when the reflexive-intransitive clitic *se* is added to it, so that the causative operator is cancelled in the derived intranisive *topiti se* "melt, become melted". However, one must note that the lexical rule for cancelling a logical operator at the same time renders the verb intransitive, i.e., changes the argument structure of the verb. One wonders, then, what piece of information is actually stored in the lexicon with the basic lexical entry: is it the information about the verb's argument structure, or rather its operator structure, or both (since in many cases the two are not independent of each other)?

Should we assume that the argument structure is dependent on the logical operator structure in the lexical representation of verbs? Perhaps the lexicon should be represented as a network of lexical representations, interrelated by lexical rules. In this case, relationships between semantically related verbs differing in M-tranisitivity could be represented along the following lines:

$$[\textbf{do}' (y, \varnothing)] \text{ CAUSE } [\text{BECOME } \textbf{melted}' (x)]$$

$\uparrow$

melt $\longrightarrow$ BECOME **melted**' (x)

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24.   Cp. Kumaxov (1971: 194–197)

25.   For a collection of such pairs see Kumaxov (1981: 231–234).

This scheme indicates that the English verb *melt* has two uses – it can be both transitive and intransitive, with no formal difference whatsoever. This would also be the representation of the Kabardian "labile" verbs, such as *ʔ°an* "thresh".[26] On the other hand, Kabardian *van* is intransitive, but it can become transitive by adding the causative prefix *ġa-*, and this is captured by the following lexical rule:

$$van \longrightarrow \text{BECOME } \textbf{melted}' \text{ (x) } \xrightarrow{\ +Ga-\ } \text{[do}' \text{ (y,0)] CAUSE [BECOME } \textbf{melted}' \text{ (x)]}$$

The relationship between the "anticausative verbs", or derived intransitives, and the basic transitives from which they are derived, would also be captured by a lexical rule. Romance and Slavic languages achieve the "anticausativization" by adding the reflexive marker (cp. Croatian *se*, or German *sich*) to transitives. Croatian *topiti* "melt (transitive)" vs. *topiti se* "melt (intransitive)", would have the following representation:

$$topiti \longrightarrow \text{[do}' \text{ (y, 0)] CAUSE [BECOME } \textbf{melted}' \text{ (x)] } \xrightarrow{\ +\ -se\ } \text{BECOME } \textbf{melted}'$$

The problem is now – how to represent lexical entries that are neither transitive nor intransitive by themselves, but get different transitive or intransitive affixes, e.g., Kabardian *tx-* "read"? Here is a suggestion:

$$tx\text{-} \ \xrightarrow{\ +\ \partial\ } \ \textbf{do}' \text{ (x, [} \textbf{read}' \text{ (x, y)]) \& INGR } \textbf{read}' \text{ (y)}$$

$$+ \ \text{-}a$$
$$\textbf{do}' \text{ (x, [} \textbf{read}' \text{ (x, y)])}$$

In this scheme, the verb does not receive *any* lexical representation before the application of some lexical rules. In Kabardian, the number of such verbs is exceptionally large, but they exist in many languages, cp. e.g., German *versinken* "sink (intransitive)" vs. *versenken* "sink (transitive)", differing only in ablaut. Haspelmath (1993) and Comrie (2006) call such verbs "equipollent".

This basically means that, at least in some cases, it is not the verbal *root* that is assigned a logical form, but rather the verbal *stem*, already modified by some affixes. The lexicon should not be viewed as a storehouse, or a repository of words, but as a highly structured network of morphemes and their combinations. I do not think that

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26. The term "labile", as applied to verbs that have both transitive and intransitive uses is somewhat problematic (cp. Hewitt 1982), but it has been adopted by Haspelmath (1993) and Comrie (2006), among others.

this way of representing the lexicon is in any way theoretically problematic, or incompatible with the RRG style of lexical decomposition.[27]

5.   Conclusion

When we are claiming that Kabardian has almost no primary transitive verbs, all we are saying is that the lexical entries for Kabardian verbs are rather unlike those of English *melt* and Croatian *topiti* "melt". Regardless of whether our analysis of Kabardian is correct or not, it raises an important theoretical question: can there be human languages with no transitive verbs, or, to be more precise, languages in which all transitive verbs would be derived from intransitives by morphological or syntactic rules?

The lack – or very near lack – of underived transitive verbs appears to be rather rare typologically, but it has been reported for a number of languages, e.g., Boumaa Fijian (Dixon 1988), Tarascan (Ricardo Maldonado, p.c.), and the Salish languages (Dan Everett, p.c.). Whether a clear example of such a language can be found or not, it appears that it is theoretically possible. Languages like Kabardian or Boumaa Fijian appear to be very close to this idealized prototype without underived transitive verbs.

In such languages the (M-)transitivity of a verb does not seem to be readable from the lexical entry, as most syntactic theories assume. However, the information about the (M-)transitivity of each *verbal form* is indeed contained in the lexicon, but this information is available only after the application of some lexical rules, by which the form in question is derived from the basic lexical entry. Our investigation of Kabardian verbal system leads us to conclude that languages differ considerably in the way these lexical rules are organized, as well as in the way the M-transitivity can be read off the lexical representation of their verbs.

Appendix

Abbreviations of glosses:

A = Actor	NEG = negation
AF = affirmative	NOM = nominative
CAUS = causative	PL = plural
ERG = ergative/oblique	POT = potential
IMPF = imperfect	PRES = present

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27.   For a similar approach to lexical rules see Van Valin (to appear).

INF = infinitive   PRET = preterite
REFL = reflexive   SG = singular
U = Undergoer

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Ditransitive constructions

Towards a new Role and Reference Grammar account?

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This paper reviews some of basic argument marking properties of ditransitive constructions and asks how various syntactic frameworks deal with them. In particular, I critically examine two accounts within Role and Reference Grammar (RRG). I lay out a basic typology of three alignment types: indirective alignment, neutral alignment, and secundative alignment. Since the latter is not common in the most widely studied languages, theoretical frameworks have typically had problems with it, including the earlier account within RRG. I argue that the three ditransitive alignment types are parallel to the three monotransitive alignment types (accusative, neutral, ergative), and that it is worth exploring an alternative RRG account that operates with two additional macroroles, R and T, which function much like A and U.

In this paper, I will examine the treatment of ditransitive constructions in Role and Reference Grammar and compare it to the perspective on ditransitives that I have developed in earlier work (Haspelmath 2005a, 2007a), as well as to some other formal grammatical frameworks. I will conclude by proposing a fairly radical revision of the standard treatment of ditransitive constructions in RRG (Guerrero & Van Valin 2004; Van Valin 2007).

1.　Some foundational principles for syntactic theorizing

I have long been a sympathizer of Role and Reference Grammar (RRG), in particular because it adopts three foundational principles of syntactic theorizing that I regard as extremely important and that have been neglected in most other formal syntactic approaches:

i.　**Non-apriorism:** This principle says that descriptive concepts should not be selected a priori, but should be determined separately for each language on the basis of language-internal evidence (cf. Croft 2001; Haspelmath 2007b; Frajzyngier 2006). This principle is not very prominent in writings on RRG, but Van Valin (2006) stated very clearly at the beginning of a plenary conference presentation: "RRG is a non-aprioristic theory".

ii.   **Typological adequacy:** This principle says that the theoretical approach should be applicable to any language and not be biased toward individual languages such as English, German, Lezgian or Lakhota. This principle has been prominent in RRG since its inception and is perhaps the main reason why RRG looks so different from other mainstream formal theories such as Minimalism, LFG or HPSG.

iii.   **Semantic-pragmatic motivation:** It is recognized in RRG that syntax cannot be understood separately from semantics and pragmatics, because to a very large extent it is semantically and/or pragmatically motivated.

However, there are also two principles of RRG that are problematic and that I will argue should be reconsidered:

iv.   **Nonautonomy of syntax:** Syntax is not autonomous, and semantic and syntactic statements can be mixed freely. The principle has not been formulated in this way, but as we will see, RRG practice sometimes shows that a version of it is assumed.

v.   **Descriptive simplicity:** An optimal (semanto-)syntactic framework should allow linguists to formulate very simple rules. Again, I am not aware of an explicit statement of this principle in the RRG literature, but it is clear from many of the arguments for particular analyses that such a principle is often assumed, as it is in generative linguistics.[1]

Finally, I want to argue against a principle that would probably not be defended by anyone:

vi.   **Passive Privilege:** Passivization is more important than other behavioural properties for the organization of syntax. We will see below that apparently something like this has been assumed.

2.   Ditransitive constructions

Before going on to discuss how various grammatical frameworks deal with ditransitive constructions, I introduce here a few concepts that are crucial to my own understanding of the relevant range of phenomena.

2.1   Delimitation

Ditransitive constructions are defined here as three-argument constructions with an actor, a theme, and a "proto-recipient" (Primus 1999), i.e., an argument that is similar to a recipient and occurs in a three-place construction. Proto-recipients include the following more specific roles: recipient-possessor (with "give", "hand", "donate"), goal-possessor (with "bring", "send"), addressee-listener (with "tell", "explain"), and addressee-viewer (with "show"), as well as other closely related roles.

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1.   In a personal communication, Robert Van Valin confirms this: "RRG has always striven for the simplest, most general analyses possible with as little stipulation as possible."

Not included in the category of ditransitive constructions are actor-theme-location patterns of the "load/spray" type. Thus, following common usage in the literature, *ditransitive* is narrower than *three-place*.

The phenomena that are of interest here are various coding properties and behavioral properties of the theme argument (T) and the recipient argument (R), as well as alternations such as the Dative Alternation in English, illustrated in (1a–b).

(1) a. Prepositional Dative Construction:
Pedro gave Aisha (R) his e-mail address (T).

b. Double-Object Construction:
Pedro gave his e-mail address (T) to Aisha (R).

2.2 The three major alignment types

I start from the observation that in studying ditransitive constructions across languages, it is helpful to distinguish three main alignment types, analogous to the three well-known monotransitive alignment types (cf. Haspelmath 2005a; Siewierska 2004: 57–63).
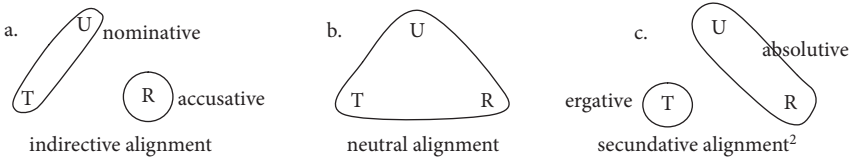
The picture that is shown in (2) has become standard textbook wisdom for two-place transitive constructions. If we use the well-known hyperroles S (single argument of intransitive verb), A (actor, agent-like argument of transitive verb) and U (undergoer, patient-like argument of transitive verb), we can say that if S and A are treated alike as opposed to U, we get **accusative alignment** (as in 2a); if all three are treated alike, we get **neutral alignment** (as in 2b); and if S and U are treated alike as opposed to A, we get **ergative alignment** (as in 2c).

(2) The major monotransitive alignment types

a. S nominative   b. S   c. S absolutive
A   U accusative   A   U   ergative A   U
accusative alignment   neutral alignment   ergative alignment
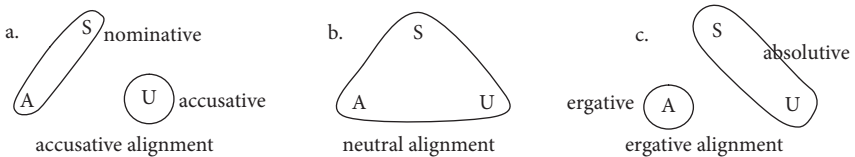
Now as Blansitt (1984) and Dryer (1986) first pointed out (see also Croft (1990: 100–108); Dryer 2007), the relationship between the two object arguments in ditransitive clauses can be conceptualized in exactly the same way. The hyperroles in ditransitive clauses are R (recipient-like argument, or proto-recipient) and T (theme-like argument). Depending on whether it is T or R that is treated like the monotransitive U, we get two different non-neutral alignment patterns and a neutral pattern, shown in (3a–c). In Dryer's (1986) terminology, when T is treated like the monotransitive U, we have a **direct-object/indirect-object** distinction. Renaming it to **directive/indirective**, as in (3a), makes the parallel to monotransitive alignment even clearer. And when R is treated like the monotransitive U, we have a **primary-object/secondary-object** distinction. Again, for terminological convenience this has been renamed to **primitive/secundative** in (3c).

(3)   The major ditransitive alignment types

a. U / nominative   T / R accusative
indirective alignment

b. U   T   R
neutral alignment

c. U absolutive   ergative   T   R
secundative alignment[2]

These alignment types are relevant for any morphosyntactic pattern that could distinguish the arguments, but for expository convenience the following examples just show these alignment types as expressed in flagging, i.e., case and adpositional marking.

i.   indirective alignment: T and U show accusative case

(4)   German

a.   *Sankt Georg (A) tötete den Drachen$_{ACC}$ (U).*
'St. George killed the dragon.'

b.   *Sankt Martin (A) gab dem Bettler$_{DAT}$ (R) seinen Mantel$_{ACC}$ (T).*
'St. Martin gave the beggar his cloak.'

ii.   neutral alignment: U, T and R show accusative case

(5)   Martuthunira (Pama-Nyungan; Dench 1995: 156, 67)

a.   *Ngayu   nhawu-lha   kayarra-a   tharratal-yu (U).*
I.NOM   see-PST   two   bird(sp.)-ACC
'I saw two *tharratal* birds.'

b.   *Ngunhu   kanyara   ngurnu   jinkarn-ku (T)   yungku-lha*
that.NOM   man   that.ACC   stick-ACC   give-PST

ngurnula-ngu-u   mimi-i (R).
that.DEF-GEN-ACC   uncle-ACC

'That man gave his uncle the digging stick.'

iii.   secundative alignment: only T shows a preposition

(6)   Yoruba (Benue-Congo; Rowlands 1969: 21)

a.   *ó   pa   mí (U)*
he   kill   me
'He killed me.'

b.   *ó   fún   mi (R)   l'   ówó (T)*
he   give   me   SEC   money
'He gave me money.'

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2.   Note that the alignment type is called *secundative*, after the secondary object (not *primative*), because the *secundative* argument is the special case (this is analogous to the terms *accusative alignment* and *ergative alignment*). See also Van Valin (2005:127), where it is noted that the term "primary object language" creates problems.

3.   Some other approaches to ditransitive constructions

I will now look at a few formal syntactic frameworks and their way of dealing with ditransitive constructions, as a prelude to my discussion of Role and Reference Grammar's approach in the subsequent sections.

3.1   Relational Grammar

Relational Grammar (Perlmutter 1980; Blake 1990), an approach that is no longer widely practiced but that was highly influential in the 1970s and 1980s, was especially concerned with alternations such as the English Dative Alternation. This was analyzed in a way analogous to the passive alternation. Relational Grammar asssumed the three core grammatical relations "1" (subject), "2" (direct object), and "3" (indirect object), as shown in (7) and (8) below the core arguments.

(7)   *Pedro gave   his e-mail address   to Aisha.*
        1   2   3

(8)   *Pedro gave   Aisha   his e-mail address.*
        1   3   2   (initial)
        1   2   **Chômeur**   (final)

The "dative-shifted" form of the alternation in (8) is described by the operation of 3-to-2 Advancement, which changes the grammatical relation of the recipient *Aisha* from 3 at the underlying ("initial") stratum to 2 at the surface ("final") stratum. Since each grammatical relation can occur only once per clause, the former 2 (the theme *his e-mail address*) is turned into a chômeur, a special grammatical relation for a noun phrase with an underlying core relation that was ousted by an advancement process. The parallel with the passive construction s shown in (9)–(10): Passivization is analyzed as 2-to-1 Advancement, and the agent phrase is a chômeur.

(9)   *Aisha   criticized   Pedro.*
        1   2

(10)   *Pedro   was criticized   by Aisha.*
        2   1   (initial)
        1   **Chômeur**   (final)

Problems with this approach became apparent soon. One problem is that the system consisting of the universal core relations 1, 2, 3 and allowing no doubling of grammatical relations cannot handle cases with neutral alignment, where the recipient and the theme arguments have the same syntactic properties. Gary & Keenan (1977) cited the example of the Bantu language Kinyarwanda, which they claimed must be analyzed as having two (direct) objects. For the particular case of Kinyarwanda, Dryer (1983) claimed that there are some minor differences between the recipient and the theme object after all, so that the Relational Grammar account would still be viable. However, it is unclear how easily this solution can be generalized.

Another problem, highlighted by Dryer (1986), is the fact that cases of secundative alignment can be handled only by obligatory 3–2 Advancement, as proposed, for instance, by Aissen (1983, 1987) for Tzotzil, a Mayan language of Mexico. This is as if one were to handle ergativity by obligatory passivization, an approach that was widespread in the 19th century, but does not seem acceptable anymore. To address this issue, Dryer (1986) introduced the primary/secondary object distinction, but without abandoning the primacy of Relational Grammar's 2/3 contrast. It was only in later work, starting with Croft (1990: 100–108), that the secondary/primary contrast was seen as fully parallel to and on an equal footing with the indirect/direct contrast.

3.2   Functional Grammar

Functional Grammar (Dik 1989, 1997) is a monostratal theory that is closer to Role and Reference Grammar in its basic architecture, but its Semantic Functions correspond fairly closely to Relational Grammar's initial stratum, while FG's Syntactic Functions correspond to Relational Grammar's final stratum. Each argument is assigned a Semantic Function, and an argument may additionally be asssigned one of the two Syntactic Functions Subject and Object. Corresponding to Relational Grammar's initial 1, 2 and 3, we have Agent, Patient and Recipient, and corresponding to Relational Grammar's final 1 and 2, we have Subject and Object. Corresponding to the chômeur, Functional Grammar has Agent and Patient arguments without a Syntactic Function. This is illustrated for passivization in (11)–(12), and for the Dative Alternation in (13)–(14).

(11)   *Aisha   criticized   Pedro.*
    Ag   **Pat**
    Subj   **Obj**

(12)   *Pedro   was criticized   by Aisha.*
    Pat   **Ag**
    Subj

(13)   *Pedro   gave   his e-mail address   to Aisha.*
    Ag   **Pat**   **Rec**
    Subj   **Obj**

(14)   *Pedro gave   Aisha   his e-mail address.*
    Ag   **Rec**   **Pat**
    Subj   **Obj**

This system avoids the choice between (13) and (14) as the underlying structure that was a problem for Relational Grammar (as also discussed by Dryer 1986), because neither is more "basic" than the other. But Functional Grammar has the same problems as Relational Grammar with neutral ditransitive alignment as in Kinyarwanda, and it also has the same problems with secundative alignment. Interestingly, the

solutions offered were quite parallel: Where Relational Grammar had to assume oblig-atory 3-to-2 Advancement, Dik (1989: 240–241, 1997: 282–289) had to assume FG's counterpart of this, obligatory Object assignment. This is completely against the spirit of Dik's Syntactic Functions, which are supposed to be relevant only when an alternation exists (i.e., Subject assignment is supposed to be restricted to languages with passiviza-tion, and Object assignment is supposed to be restricted to languages with a dative alternation; see also Siewierska 1998).[3]

3.3   Lexical Decomposition Grammar

Lexical Decomposition Grammar (Wunderlich 1997, 2006) is another ambitious attempt at accounting for the properties of verbal arguments in a systematic way from a cross-linguistic perspective. LDG operates with grammatical-relations features on arguments, as illustrated in the argument structure of German *töten* "kill" in (15). This consists of the decomposition on the right hand side ("x acts and thereby y comes to be dead"), and the two arguments marked by lambdas, annotated by the features [±hr] ("there is a higher role/there is no higher role") and [±lr] ("there is a lower role/there is no lower role"). The feature [+hr] corresponds roughly to Role and Reference Gram-mar's undergoer, and [+lr] corresponds to actor (Wunderlich 2006: 65).

(15)   *töten* λy λx {ACT(x) & BECOME DEAD(y)}
                 +hr   –hr
                 –lr   +lr
                 (dir. object) (subject)

In LDG, cases also have features of the same type, and they must match the features of the arguments. Nominative/absolutive case has the feature specification [ ] (i.e., com-plete underspecification), accusative is [+hr], and ergative is [+lr]. If a language has an accusative and a nominative/absolutive, accusative must go on the direct object and nominative/absolutive on the subject, because otherwise the features do not match. If, however, a language has an ergative and a nominative/absolutive, ergative must go on the subject and nominative/absolutive on the object. Thus, like RRG's Actor/Undergoer system, LDG's feature system is designed to account both for accusative and for ergative alignment. In this regard, LDG and RRG are clearly superior to Rela-tional Grammar and Functional Grammar.

Now what happens in ditransitive constructions? Consider German *geben* "give" in (16). Here the decomposition is "x acts and thereby y comes to possess z"), and the three arguments marked by lambdas are shown in (16) as well (Wunderlich 2006: 113):

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3.   Functional Grammar, like Relational Grammar, also has a problem with ergative align-ment, and interestingly, Dik (1997: 284–289) suggests a similar solution to ergativity: It could be explained (diachronically) by obligatory passivization.

(16)   *geben*:   λz   λy   λx   {ACT(x) & BECOME POSS(y,z)}
                  +hr   +hr   –hr
                  –lr   +lr   +lr
                  (dir. object) (ind. object) (subject)

The indirect object is between the subject and the direct object in the hierarchy of roles, so it gets both the feature [+hr] (because the subject has a higher role) and [+lr] (because the direct object has a lower role). If it is assumed that the dative case has the feature specification [+hr, +lr] (more marked, corresponding to the fact that typically the dative case is morphologically more marked than the accusative or ergative), the linking between the cases and the arguments works: While both nominative and accusative would be able to unify with the indirect object's [+hr, +lr], the dative takes precedence because it is the more specific case.[4]

LDG has the same problems as Relational Grammar and FG with neutral alignment, but Wunderlich does not discuss such cases. However, he does discuss secundative alignment, and unfortunately, his elegant system becomes much less neat here. In (17), we see Wunderlich's lexical entry for a verb such as Yoruba *fún* "give". The feature [±hr], which distinguishes between the subject and the objects, is distributed in the same way, but instead of the feature [±lr], a new feature [±ho] ("there is a higher object/there is no higher object") is used to distinguish between the two objects.

(17)   *fún*:   λz   λy   λx   {ACT(x) & BECOME POSS(y,z)}
                +hr   +hr   –hr
                +ho   –ho
                (sec. object) (prim. object) subject

This is inelegant, because the secundative construction needs new machinery, while the indirective construction can be described with the same machinery that is independently needed to account for the accusative/ergative contrast. Moreover, the system cannot handle languages with ergative monotransitive alignment and secundative ditransitive alignment (Wunderlich 2006: 137). Apparently the fact that European languages overwhelmingly show the indirective construction has influenced the design of the theory.

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4.   Interestingly, LDG's treatment of the dative is the exact opposite of RRG's, where the dative is considered the default case (Van Valin 2005: 110). For LDG, an important further consideration is that the dative also tends to have the most specific overt marking, compared to nominative/absolutive (which are generally zero-coded) and accusative/ergative (which are at least sometimes zero-coded), so that overt coding ("formal markedness") corresponds to a doubly positive feature specification ("functional markedness"). (This is of no concern to RRG, which argues that causee marking by dative case supports the view of the dative as the default case; Van Valin & LaPolla 1997: §9.2.2.)

4. Role and Reference Grammar

Readers of this volume will by and large be familiar with the main features of Role and Reference Grammar, so this overview can be brief.

4.1   Argument structures

In RRG, the argument structures are determined by possible Logical Structures, which are seen as properties of the human conceptual system. Table 1 shows the well-known list of possible Logical Structures according to the RRG system, with each Logical Structure corresponding to a basic verb class.

Table 1. Lexical representation for Aktionsart classes (from Van Valin 2007: 35)

Verb class	Logical structure
STATE	**predicate′** (x) or (x,y)
ACTIVITY	**do′** (x, [**predicate′** (x) or (x,y)])
ACHIEVEMENT	INGR **predicate′** (x) or (x,y), or
	INGR **do′** (x, [**predicate′** (x) or (x,y)])
SEMELFACTIVE	SEML **predicate′** (x) or (x,y), or
	SEML **do′** (x, [**predicate′** (x) or (x,y)])
ACCOMPLISHMENT	BECOME **predicate′** (x) or (x,y)]), or
	BECOME **do′** (x, [**predicate′** (x) or (x,y)])
ACTIVE ACCOMPLISHMENT	
do′ (x, [**predicate₁′** (x, (y))]) & BECOME **predicate₂′** (z,x) or (y)	
CAUSATIVE	α CAUSE β, where α, β are LSs of any type

All ditransitive predicates (in the sense of §2.1 above) are regarded as having a Logical Structure of the type in (18), where an agent *x* acts to cause a recipient *y* to be in some predicate relation to the theme *z*.

(18)   [**do′** (x, Ø)] CAUSE [BECOME **predicate′** (y, z)]

In the case of transfer verbs, the predicate is **have′**, and for the sake of simplicity, we can limit ourselves to transfer verbs in this article. For mental ditransitive verbs like "show", where the predicate would not be **have′**, the analysis would be basically the same.

4.2   Coding and alternations

In English, there are two possibilities for realizing this Logical Structure. Most straightforwardly, the theme can become Undergoer, following the universal Actor-Undergoer Hierarchy in Figure 1. According to this hierarchy, the theme (the second argument (*z*) of the **predicate′** in (18)) is "less marked" (i.e., universally preferred) as Undergoer than the recipient (the first argument of the **predicate′** in (18)).

This "default" choice of Undergoer yields the English Prepositional Dative Construction (*Pat gave the book to Kim*). The constituent structure, the Logical Structure and the linking to Actor and Undergoer are shown in Figure 2 (from Van Valin 2007: 44).
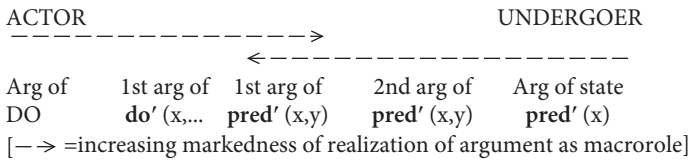
ACTOR _ _ _ _ _ _ _ _ _ _ _ _ _→   UNDERGOER
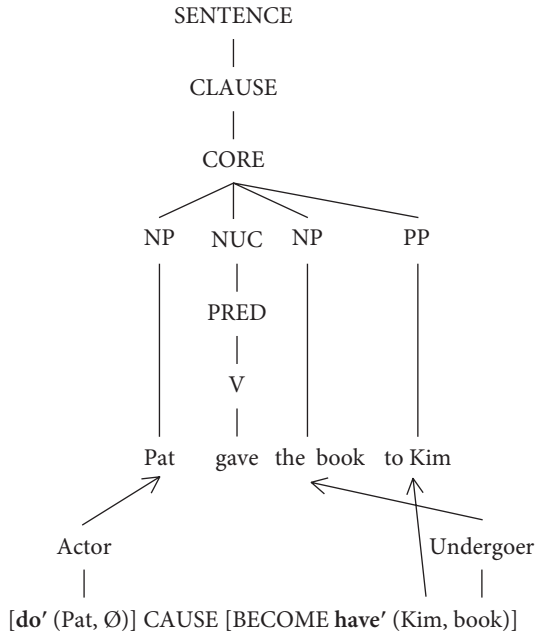   ←_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Arg of   1st arg of   1st arg of   2nd arg of   Arg of state
DO   **do′** (x,...   **pred′** (x,y)   **pred′** (x,y)   **pred′** (x)
[— → =increasing markedness of realization of argument as macrorole]

Figure 1. The actor-undergoer hierarchy.

SENTENCE
|
CLAUSE
|
CORE
NP   NUC   NP   PP
|
PRED
|
V
|
Pat   gave   the book   to Kim

Actor   Undergoer
| |
[**do′** (Pat, Ø)] CAUSE [BECOME **have′** (Kim, book)]

Figure 2. The English prepositional dative construction.

The choice of the preposition *to* for the recipient also follows a fairly general rule for English *to* (discussed in Van Valin & LaPolla 1997: 376–377; Van Valin 2005: 113).

But English allows a second possibility, the Double-Object Construction (*Pat gave Kim the book*), where the recipient is chosen as undergoer. This linking is shown in Figure 3 (again from Van Valin 2007: 45).

This choice of undergoer is not derived from general principles, but is specifically stipulated for this construction. It is also called "marked undergoer selection" (Van Valin 2005: 61, 2007: 43).

Thus, what the classical Role and Reference Grammar description shares with Relational Grammar, Functional Grammar and Lexical Decomposition Grammar is that the indirective pattern is privileged over the secundative pattern. The next section will discuss the RRG description and some of its problems in greater detail.

```
                    SENTENCE
                        |
                     CLAUSE
                        |
                      CORE
                   /   |   \    \
               NP   NUC   NP    PP
                |     |    |     |
                    PRED
                      |
                      V

              Pat  gave  Kim  the book
               ↗            ↖    ↖
            Actor            Undergoer
               |                |    
[do′ (Pat, Ø)] CAUSE [BECOME have′ (Kim, book)]
```
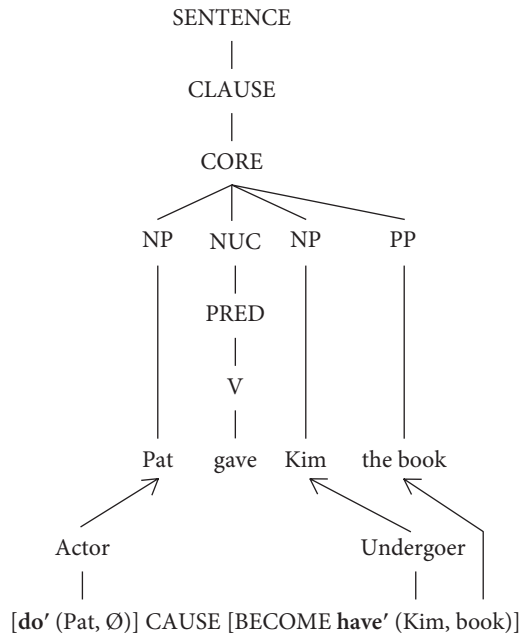
Figure 3. The English double-object construction.

5. Problems with the RRG analysis

5.1 "Marked" Undergoer selection

Why should one of the possibilities for coding the ditransitive construction, namely the indirectively aligned pattern, be considered "unmarked" or default, while the other one is "marked"?

The term "(un)marked" has many different senses (cf. Haspelmath 2006), so the first question is in what sense the choice of undergoer is "unmarked". An obvious possibility is "unmarked" in the sense of "normal", or cross-linguistically frequent. It is true that the available cross-linguistic evidence indicates that the indirective pattern is more frequent than the secundative pattern and the neutral pattern. However, it is not much more frequent: Haspelmath (2005b) provides the figures in Table 2, based on a world-wide sample of 339 languages.

Also within languages that have both patterns (about 10% of the languages, both in Siewierska's (1998) data and in Haspelmath's (2005a) data), it is not the case that the dative pattern is necessarily the more frequent pattern. In English, for example, the double-object pattern is clearly more frequent, at least in the spoken language.

Table 2. The dominant ditransitive alignment patterns in 339 languages (based on Haspelmath 2005b)

	Languages	Genera	Families
Indirect-object construction	189	104	53
Double-object construction	84	51	20
Secondary-object construction	66	51	30

Van Valin (2005: 62) gives several further reasons for considering the Preposi-tional Dative Construction in English "unmarked". One is that the Double-Object Construction is more constrained and does not, for example, allow personal pronouns in theme position (*Mary gave John them). But this can also follow from the fact that the Prepositional Construction is more explicitly coded. That constructions with clearer coding have greater possibilities of combination is normal (as, e.g., in the case of complement clauses with and without *that*) and perfectly understandable from a functional point of view (cf. Rohdenburg 1996); no appeal to "markedness" is needed. Another reason is that in synthetic compounds like *flowergiver* and *girlgiver*, the first compound member is invariably interpreted as the theme. But this is evidently closely related to the fact that in such quasi-incorporation structures, the argument is non-referential, and human recipients are normally referential. Even in languages in which the recipient is always the undergoer, only themes can normally be incorporated.[5]

Thus, one wonders whether the unequal treatment of the indirective pattern and the secundative pattern in RRG is a feature that was inherited from transformational approaches, where one of the alternating patterns is regarded as "underlying/initial", while the the other one is "derived/final". RRG is a monostratal theory, so there would be no intrinsic reason to give privileged treatment to one pattern in an alternation, and the alternative RRG account suggested below in §6 treats them both equally.

But even if one of the two patterns (indirective and secundative) is to be given a privileged treatment, one would still have to show that the secundative pattern could not be the privileged, more basic pattern. In derivational accounts, it has occasionally been proposed that the indirective pattern should be derived from the secundative or the double-object pattern. Most prominently, Dryer (1986) proposed an "Antidative Shift" for English in the Relational Grammar framework. According to this approach, the double-object construction in (19) is primary, and the dative construction in (20) is derived from an underlying structure like (19) by SO-to-PO (secondary to primary object) advancement.

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5. Van Valin (2005: 62) also observes that "dative-shift" alternations generally require overt applicative marking for the construction in which the non-theme is the undergoer, which would again support the "markedness" of non-theme undergoer assignment. However, it seems that applicative marking with typical ditransitive verbs is quite rare. Most applicatives are benefi-ciary, comitative and instrumental applicatives (Peterson 2007).

(19) *Pedro gave   Aisha   his e-mail address.*
　　　　SU　　　　PO　　　　SO

(20) *Pedro gave   his e-mail address   to Aisha.*
　　　　SU　　　　SO　　　　　　PO
　　　　SU　　　　PO　　　　　　Chômeur

In a similar way, RRG could modify the Actor-Undergoer Hierarchy in Figure 1 in such a way that the secundative pattern becomes the "unmarked" choice, but this would probably have undesired repercussions elsewhere. Overall, one gets the impression that an important reason (perhaps the most important reason) for saying that the theme undergoer is "unmarked" is that it fits better into the overall RRG system and makes it simpler (cf. the unstated principle of descriptive simplicity mentioned in §1). This is a gain that comes at the price of relative unmotivatedness of the choice of which argument is the "unmarked" undergoer.

In Guerrero & Van Valin (2004) and Van Valin (2007), a revised RRG account is presented, which recognizes that "the markedness relations expressed in Figure 1 are not valid universally". This account thus abandons the idea of a universal default, although the idea that there may be a language-particular default is still retained. I will discuss this revised account below in §7. Although Van Valin (2005: 123–127) adopts this revised account, he still presents arguments for the markedness approach elsewhere in the book (p. 61–62), which is why I have included this discussion here.

5.2.   Undergoer as a "semantic macrorole"

Van Valin (2004: 74–78) emphasizes that Actor and Undergoer are ***semantic* macroroles,** i.e., that in contrast to purely syntactic grammatical relations of other frameworks, these concepts have semantic import. Given this, it is expected that there should be a semantic difference between a theme-undergoer and a recipient-undergoer construction.

That this is sometimes indeed the case can be seen clearly in the locative alternation (Van Valin & LaPolla 1997: 145; Van Valin 2007: 49):

(21) a. *Oxfam loaded the plane (U) with relief goods.*
　　　b. *Oxfam loaded relief goods (U) on the plane.*

It is well-known that (21a) and (21b) are not identical semantically, and it is reasonable to relate their differences to the fact that the location is undergoer in (21a), while the theme is undergoer in (21b).

Such a semantic difference can also be observed for directional-motion verbs like "throw":

(22) a. *Pedro threw the ball (U) to Aisha.*　　　　　　　　('in the direction of')
　　　b. *Pedro threw Aisha (U) the ball.*　　　　　　　　　('into the possession of')

It is only in the latter case that it can be inferred that Aisha came to have the ball.

In the recent literature on these patterns, two different event structures have often been posited (e.g., Goldberg 1992, 1995; Harley 2002; Wunderlich 2006: §6.6):

(23)   a.   [**do′** (*Pedro*, Ø)] CAUSE [BECOME **be-at′** (*ball*, *Aisha*)]
      b.   [**do′** (*Pedro*, Ø)] CAUSE [BECOME **have′** (*Aisha*, *ball*)]

Given these event structures, the semantic difference between (22a) and (22b) is easily explained. (Different event structures are also possible for the locative alternation in (21), cf. Kailuweit 2005).

However, such a dual-event-structure approach is not motivated for all ditransitive verbs in English, as was pointed out by Rappaport Hovav & Levin (2006). Simple transfer verbs like "give", "lend", "show" do not have different meanings in the two constructions, and for these verbs there is no evidence that two event structures are involved.

Moreover, the non-default choice of undergoer must be lexically specified and cannot be derived fully from a verb's meaning. In this sense, undergoer is clearly a syntactic device. Van Valin (2004: 77–78) notes that nondefault macrorole selection is not completely arbitrary, but seems to be semantically motivated – but this is quite typical of syntactic rules: They cannot be stated in purely semantic terms, but they are not entirely arbitrary semantically. Crucially, undergoer selection must make reference to non-semantic information, unlike (Jackendovian) thematic roles or (Dowtyan) proto-roles.[6]

Van Valin (2004: 75) suspects that approaches like Manning's (1996), where the counterparts of actor and undergoer have syntactic status, are motivated by the assumption of the autonomy of syntax. But "autonomy of syntax" can mean two things:

i.   syntax should be described and understood without regard for semantics (rejected by most linguists, especially functionalists) (*formalist autonomy*).
ii. semantic and syntactic statements should be carefully distinguished (assumed by most linguists) (*descriptive autonomy*).

It seems to me that there are very good reasons for rejecting formalist autonomy in (i), and no good reasons for rejecting descriptive autonomy in (ii). In fact, the formalist/functionalist divide in linguistics cannot be usefully linked to the autonomy notion, despite what some functionalists and some formalists have claimed (especially Croft 1995 and Newmeyer 1998; see Haspelmath 2000). Manning's reasons for claiming that actor and undergoer have syntactic status is probably just motivated by descriptive autonomy. I would urge that RRG, too, should adopt the principle of

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6.   The features +lr and +hr of Lexical Decomposition Grammar, which correspond to actor and undergoer (as we saw in §3.3), are similar in that they may also be introduced by "exceptional lexical marking" (Wunderlich 2006: 106), not just derived by rule from the decompositional structure.

descriptive autonomy (cf. §1), and either accept that actor and undergoer are not (entirely) semantic concepts, or redefine their role in such a way that nonsemantic rules such as lexically specified undergoer selection are excluded. (The latter approach will be pursued in §6 below.)

5.3   What to do with "symmetrical languages", i.e., fully neutral alignment?

As we saw earlier, some languages have been reported as not making a grammatical distinction between R and T in ditransitive constructions. An example of a language in which both the T and the R are coded with the same case (Accusative) is the Pama-Nyungan language Martuthunira that we saw earlier in (5). The examples in (24) show that both the R and the T may be passivized.

(24)   Martuthunira (Dench 1995: 229)

    a.   *Ngunhu   pawulu yungku-yangu   murla-a   nganaju-wu-lu   yaan-tu.*
        that.NOM   child   give-PASS.PFV   meat-ACC   I-GEN-EFF   wife-EFF
        'That child was given meat by my wife.'

    b.   *Nhiyu   murla yungku-yangu yirna   kanyara-a ngulu*
        this.NOM   meat   give-PASS.PFV   this.ACC   Mann-ACC jene.EFF

        wartirra-lu.
        woman-EFF

        'This meat was given to this man by that woman.'

Other languages with "fully neutral" constructions are Cavineña (Tacanan; Bolivia; Guillaume 2006), the Peruvian Panoan languages Shipibo-Konibo (Valenzuela 2001) and Matsés (Fleck 2001), and Haruai (Upper Yuat; Papua New Guinea; Comrie 1993: 317). Another such language is Kinyarwanda according to Gary & Keenan (1977).

    Full neutrality of this sort has been a problem for Relational Grammar, which claims that 1, 2 and 3 are universal relations. Thus, R and T are predicted to be distinguishable in all languages in some way, though nothing is said about how. As I noted earlier in §3.1, Gary & Keenan (1977) had claimed that Kinyarwanda shows a fully symmetrical ditransitive construction, and Dryer (1983) rescued the Relational Grammar account of Kinyarwanda by observing that there are some less salient ways in which the T and the R differ after all in Kinyarwanda (with respect to causativization and "locative advancement"). Unfortunately, this claim is immune to falsification in practical terms: There is no way one could exhaustively examine all possibly relevant constructions to determine whether they privilege one of the two arguments, so one can always claim that there is probably some construction with respect to which R and T differ, even though it hasn't been discovered yet.

    Symmetry of this sort also presents a challenge to Role and Reference Grammar, as it does for other frameworks. Do these languages have two undergoers in ditransitive constructions? Or do they have no undergoer (i.e., are the M-intransitive)?

The former is excluded by the principle that there are at most two macroroles per clause (Van Valin 2005: 64), and the latter is hardly an attractive option because Martuthunira allows passivization. Van Valin (2007: 56) discusses symmetrical passivization in Kinyarwanda and proposes that passivization does not make reference to the undergoer notion in this language, but targets all non-macrorole direct core arguments. He does not say anything about which of the two non-Actor arguments is undergoer in Kinyarwanda, and presumably in a fully neutral language, there would be no undergoer at all (or at least no evidence for it). This position is probably consistent with the overall framework (after all, there are other three-argument verbs lacking an undergoer, e.g., *talk to somebody about something*), but intuitively it is strange to claim that ditransitive constructions are intransitive.

5.4   Which properties are relevant for Undergoer selection?

But it seems that some criteria for distinguishing arguments are given more weight than others by some authors. Hudson (1992) notes that only passivization supports the R-as-direct-object description of the English Double-Object Construction. As shown by (25b–c), the R can be the privileged syntactic argument ("subject") of the passive, and the T cannot (or cannot for many speakers).

(25) a. (monotransitive)   *Pedro was criticized by Aisha.*
      b. (passive) R=U_M *Pedro was given money by Aisha.*
      c. (passive) T=U_M *??Money was given Pedro by Aisha.*

As Hudson observes, quite a few other behavioural properties support the grouping of T with monotransitive U. For example, both the U and the T can be pivot with omitted-object infinitives:

(26) a. (monotransitive)   *I bought it$_i$ to put Ø$_i$ on the table.*
      b. T=U_M *He gave her$_j$ it$_i$ to put Ø$_i$ on the table.*
      c. R=U_M **He gave her$_i$ it$_j$ to cheer Ø$_i$ up.*

Hudson does not privilege the passive, but instead counts the number of properties that treat T and U alike, and finds that there are many more than properties that treat R and U alike. He concludes that it is better to say that the T is the direct object in English.

Carrying this argumentation over to RRG, could one say that in English, the ditransitive theme is the Undergoer? Van Valin (2007: 45, n. 2) answers negatively:

> This is untenable, for the following reason. The RRG analysis of passive is that the undergoer appears as the PSA ("subject") in languages like English. The RRG analysis predicts that the passive acceptable to all English speakers will be *Kim was given the book by Pat*, whereas the other analysis predicts that the universally acceptable passive form would be *The book was given Kim by Pat*.

So apparently passivization is a knock-down criterion for Undergoer selection. But why is passivization given so much prominence? Passivizability is just one among many properties of objects, and it would seem to be difficult to argue that it should be more important than the other argument properties (cf. the questionable Passive Privilege principle of §1).[7]

6.   A sketch of a radical alternative RRG account

To address the issues raised above, the RRG account of ditransitive constructions would have to be revised. Although I am not in a position to provide a full-fledged RRG account, I will now sketch the outlines that such an alternative account could have.

6.1   Four macroroles: A, U, R and T

First of all, RRG would need two additional macroroles, recipient (R) and theme (T), in addition to actor (A) and undergoer (U):

> (27)   four semantic macroroles and their definitions
>   A = actor, defined as before
>   U = undergoer of monotransitive sentences
>   R = macro-recipient, corresponding to Primus's (1999) proto-recipient
>   T = (macro-)theme

In the radical alternative account, the problems discussed in §5 would be avoided. The four macroroles are defined purely semantically, i.e., the radical alternative account avoids the mixing of semantic and syntactic information and observes descriptive autonomy (see §5.2). There is no "non-default" or "marked" selection of macroroles, so that the markedness problems of §5.1 are avoided. No criterion for grouping roles is given inherent priority, i.e., passivization would not be more important than other criteria (see §5.4). Symmetrical constructions with neutral alignment are simply regarded as constructions where U, R and T are coded in the same way (see §5.3). Since the non-actor arguments of monotransitive and ditransitive sentences have different macroroles, the question of which ditransitive non-actor argument is the undergoer would not arise.

Note also that the RRG literature already contains one argument for the macrolrole (macro-)recipient: Such a macrorole would be useful for describing recipient passives in German, as argued by Diedrichsen (2004).

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7.   Perhaps the importance of passivization in RRG has to do with the fact that RRG arose in the 1970s, when many syntacticians were interested in passivization, and all major grammatical theories, such as Relational Grammar, FG, GPSG, LFG, Space Grammar/Cognitive Grammar, felt compelled to begin the justification for their grammar with an analysis of the passive.

6.2   Coding rules and the parallel with monotransitive alignment

An important criterion for an RRG analysis is the elegance with which rules for coding arguments can be formulated. While this criterion of descriptive simplicity is problematic (as was noted in §1), it is still interesting to see how the rules for coding elements would have to be reformulated in the new system with four macroroles.

Taking into account the major alignment patterns of both monotransitive and ditransitive constructions, we can distinguish four major types of languages (cf. Dryer 2007). Since the ergativity parameter and the secundativity parameter are independent of each other (Haspelmath 2005a), all four are well attested (cf. also Van Valin 2005: 127). Figure 4 shows these four types, with one exemplifying language for each type. The labels below the language names are the macrorole groupings that are treated alike in the language (here only case-marking is relevant; other constructions may behave differently).
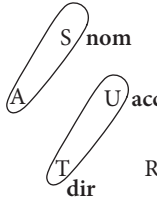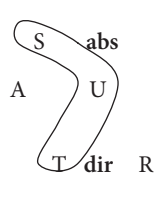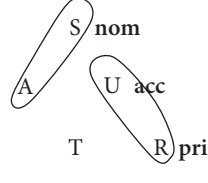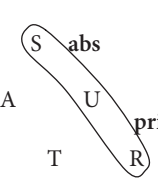
Figure 4. Four types of languages, accusative and ergative alignment.

To describe the rules for cases, RRG appeals to a simple Macrorole Hierarchy "actor > undergoer". In the radical alternative system, with four macroroles, the macrorole hierarchy would be as in (28):

(28)   Macrorole Hierarchy
       A > R, U > T

That is, actor is highest on the hierarchy, and ditransitive theme is lowest. Ditransitive recipient and monotransitive undergoer are both intermediate (and not ranked with respect to each other).

The case-marking rules of traditional RRG are given in (29) (Van Valin & LaPolla 1997: §7.3). (Note that MR stands for macrorole.)

(29) a. (accusative alignment)
          Nominative case is assigned to the highest-ranking MR argument,
          then **accusative** to the other.

      b. (ergative alignment)
          Absolute case is assigned to the lowest-ranking MR argument,
          then **ergative** to the other.

This is a very simple and straightforward system, and the additional rule for dative case (it is the default case) could not be simpler. By contrast, the case-marking rules of the radical alternative macrorole approach would be somewhat more complex, as shown in (30).

(30) a. (German-style alignment combination: accusative-indirective)
          Accusative-directive case is assigned to the lowest-ranking MR
          argument, then **nominative** is assigned to the highest.

      b. (Yoruba-style alignment combination: accusative-secundative)
          Accusative-primative case is assigned to the second highest-ranking
          MR argument, then **nominative** to the highest.

      c. (Lezgian-style alignment combination: ergative-indirective)
          Absolute-directive case is assigned to the lowest-ranking MR
          argument, then **ergative** to the highest.

      d. (Greenlandic-style alignment combination: ergative-secundative)
          Absolute-primative case is assigned to the second lowest-ranking
          MR argument, then **ergative** to the highest.

This is not dramatically more complicated, and it accounts for a lot more facts than the traditional RRG case-marking rules.[8]

6.3   Objections against "a third macrorole"

The possibility of positing a third macrorole has come up earlier in the RRG literature. Van Valin (2004: 79–81, 2005: 64–66) argues that a third macrorole should not be posited, for a number of reasons (see also Bellosta von Colbe 2004: 194–198). I do not find these reasons compelling, and some of them may be weakened by the current

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8.   However, as Robert Van Valin points out (p.c.), they do not extend automatically to intransitive verb, so in this regard they are admittedly less general.

proposal, which actually posits four rather than three macroroles. Van Valin's objections to a third macrorole are:

i.   A third macrorole would not be universal. This may be so, but it is not clear why universality should be a criterion. If the theory is non-aprioristic (see §1), it should even allow for the possibility of different macroroles in different languages. Moreover, actor and undergoer are also somewhat variable across languages. And in the current proposal, this argument has little force because macroroles are purely semantic and therefore are universal by definition (assuming that meaning is universal, at least at some level).

ii.   R and T are not treated consistently across languages, in contrast to A and U, which are always "direct (core) arguments". The problem with this argument is that it is not clear that A and U are really significantly different from R and T. The concept "direct (core) argument" is not defined very well. In Van Valin & LaPolla (1997: 29) it is said to be an argument that is not adpositionally marked, but presumably instrumental and locative arguments would not count as "direct (core) arguments". Van Valin (2005: 7) is more precise: Nominative/absolutive, accusative/ergative and dative count as "direct", whereas all other cases are regarded as "oblique". No principled reason is given for this, and no definition of "dative" is given.

iii.   "A third macrorole would be markedly less important for the syntax than A and U ... It also plays no role in the major typology of syntactic systems: ergative vs. accusative vs. split-intransitive." (Van Valin 2004: 81) This is a matter of perspective. It is true that the roles R and T are less important than A and U in the straightforward sense of occurring less frequently in texts. But otherwise the parallels between monotransitive and ditransitive alignment are striking,[9] and in traditional RRG the accusative/ergative contrast is treated in a way that is very different from the indirective/secundative contrast.

Probably the most serious objection to the radical alternative that I have proposed is that it would make analyses of other phenomena that I have not discussed here more complicated (e.g., of causative constructions). This may well be, but it would not necessarily be an argument against the proposal. Recall from §1 that descriptive simplicity is a criterion that I do not regard as particularly important, because we have no strong reason to assume that languages were designed to be simple. On the other hand, the other criteria (and non-criteria) of §1, taken together, clearly favor the alternative over the traditional account. Thus, whether the alternative is adopted will ultimately depend on how one relates to the principles of §1. I would hope that future work on RRG will at least clarify where RRG stands on these matters.

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9.   Even a "split-transitive" type (cf. Siewierska 2003) has been identified, analogous to the split-intransitive type in monotransitive alignment.

The remainder of this paper will discuss two further issues: The revised RRG approach introduced by Guerrero & Van Valin (2004) and Van Valin (2007), and the possibility of a second grammatical relation for ditransitive constructions.

7.   The revised RRG account (Van Valin 2007)

Guerrero & Van Valin (2004) and Van Valin (2007) recognize that the RRG approach to ditransitives as set out by Van Valin & LaPolla (1997) does not sufficiently take into account languages with secundative alignment and thus violates the principle of typological adequacy (see §1). They discuss one such language, Yaqui (a Uto-Aztecan language of Mexico), in some detail, showing that the simplest description for Yaqui is one in terms of the rule that the undergoer is the second highest ranking argument in the Logical Structure. This is in conflict with the universal markedness principle of Figure 1, which they abandon in favour of a "parameterized" system for undergoer selection. This is summarized in Figure 5.

ACTOR				UNDERGOER
Arg. of	1st arg. of	1st arg. of	2nd arg. of	Arg. of state
DO	**do′** (x, . . .)	**pred′** (x, y)	**pred′** (x, y)	**pred′**(x)

Actor selection: Highest ranking argument in LS
Undergoer selection:
   Principle A: Lowest ranking argument in LS (Principle C: default only)
   Principle B: Second highest ranking argument in LS

Figure 5. The revised Undergoer Selection principles.

Yaqui follows Principle B (like other secundative languages), German follows Principle A (like other indirective languages). (See also Conti Jiménez 2004, who argues that this accounts for the cross-linguistic facts.)

This approach does more justice to the symmetry of the indirective and the secundative alignment patterns, and thus addresses the problems discussed in §5.1. But there are still a number of problems:

i.   Undergoer selection is now parameterized for the indirective-secundative contrast, in much the same way as some theories parameterize "subject selection" for the accusative-ergative contrast. This is rejected by RRG, but now that the parameterization option has been allowed into RRG, one could ask why the cross-linguistic variation in monotransitive constructions is not treated in the same way.

ii.   RRG's macroroles actor and undergoer were designed to capture what accusa-
tive and ergative systems have in common—there are no Principles A (for accusative
languages) and B (for ergative languages). Given the parallels between monotransitive
and ditransitive alignment, it seems more in the spirit of RRG to posit macroroles also
for ditransitive alignment. The new RRG account thus does not express the parallels
between monotransitive and ditransitive alignments in the same straightforward way
as the radical alternative.

8.   Do we need a grammatical relation for R and T?

As explained in detail in Van Valin & LaPolla (1997: ch. 6), Van Valin (2005: 89–107),
grammatical relations are posited by RRG when there is a restricted neutralization of
semantic roles for morphosyntactic purposes. This is the case in a number of construc-
tions for which a privileged syntactic argument (PSA) has been posited.

Roughly, the PSA corresponds to what has been called "subject" in other
approaches. Since these other approaches often also posit a grammatical relation
"object", one might wonder whether an analogous concept of an "SSA" (Secondary
Syntactic Argument) might be needed in RRG as well. Van Valin (1993: 65–72) argues
that no such concept is needed, and that all the work done by an "object" relation in
other theories is done by the undergoer macrorole and other RRG notions.

However, not all groupings of non-Actor arguments can be captured by the mac-
roroles. In particular, one and the same construction may sometimes show both the U +
T grouping (i.e., directive, or "direct object") and the U + R grouping (i.e., primative,
or "primary object"). An example comes from Hyow, a Tibeto-Burman language of
Bangladesh:

(31)   Hyow (Peterson 2003: 174, 179)

a.   *yɔntɯʔa*   *uy=la*   *key*   *ʔɔ-ŋoʔwey-sɔ*
      yesterday   dog=ERG   I[ABS]   1SG.U/R-bite-CONCL
                          A   U
      'Yesterday a dog bit me.'

b.   *cu=la*   *key=a*   *cɔ*   *ʔe-pek*
      he=ERG   I=LOC   book[ABS]   1SG.U/R-give
      A   R   T
      'He gave me a book.'

Here case-marking shows an indirective pattern (U + T is zero-coded, and R is in the
locative), while indexing ("agreement") is secundative (U + R are indexed overtly, and
T is not indexed).

In traditional RRG, this cannot be described in terms of macroroles, unless one
admits that a clause gets two undergoers, one "A-undergoer" for case-marking (as-
signed by Principle A), and one "B-undergoer" for indexing (assigned by Principle B).

A similar example comes from English, where Passivization and Omitted-Object Infinitives behave differently, as observed by Hudson 1992 (cf. also the earlier discussion in §5.4):

Passivization: secundative (U + R (passivizable) vs. T (not passivizable))

(32)   a.   (monotransitive)   *Pedro was criticized by Aisha.*
        b.   (passive) R=U_M *Pedro was given money by Aisha.*
        c.   (passive) T=U_M *??Money was given Pedro by Aisha.*

Pivot with Omitted-Object Infinitives: indirective (U + T vs. R)

(33)   a.   (monotransitive)   *I bought it$_i$ to put Ø$_i$ on the table.*
        b.   T=U_M *He gave her$_j$ it$_i$ to put Ø$_i$ on the table.*
        c.   R=U_M **He gave her$_i$ it$_j$ to cheer Ø$_i$ up.*

Thus, in terms of grammatical relations, it appears that we need to say that in English, the controller of Passivization is U + R, while the pivot of Omitted-Object Infinitives is U + T. Of course, in RRG one could always resort to analyses that do not make reference to macroroles (e.g., one could say that the pivot of Omitted-Object Infinitives is the lowest ranking core argument, as Robert Van Valin points out, p.c.), but it seems that there is not always a principled way of deciding when reference should be made to macroroles and when macroroles should be left aside.

In any event, while there may be no construction requiring two different privileged syntactic arguments at the same time (which would lead to the need of an SSA in addition to a PSA), it does seem that also with respect to grammatical relations, ditransitive constructions behave much like monotransitive constructions.

9.   Conclusion: Shifting the syntax-semantics boundary in favour of syntax

In conclusion, I would like to propose that RRG should become less aprioristic and should separate syntax and semantics more strictly: the macroroles should be strictly semantic, and correspondingly, somewhat more work should be done by syntax. As suggested by the discussion in §8, we seem to need grammatical relations other than PSA.

It must be admitted that if the approach favored here is adopted by RRG practitioners, the resulting descriptions will often be less elegant and more complex than those of traditional RRG. However, I do not believe that it is a virtue of grammatical theories if they allow linguists to formulate simple descriptions of languages (see the discussion of descriptive simplicity in §1), at least not if this comes at the expense of a complicated architecture with macroroles that have a mixed semantic-syntactic motivation.

It needs to be emphasized that separating syntax and semantics in the way advocated here does not mean accepting formalist autonomy. Descriptive autonomy of the semantics and syntax is fully compatible with functionalism (as argued by Newmeyer

1998, and shown by the fact that this author has gone on to pursue a fully functionalist agenda in Newmeyer 2005).

Adopting the alternative approach proposed here would mean a rapprochement with the non-aprioristic approaches of Dryer (1997) and Croft (2001), both of which emphasize that languages are far more diverse than is generally recognized (thus requiring extensive language-particular stipulation), but that whatever generality exists is amenable to explanation in semantic-pragmatic terms.

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Fluid transitivity and generalized semantic roles

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This paper focuses on multiple-argument verbs in syntactically accusative and ergative languages which exhibit case (frame) alternations depending on the context in which they occur and proposes that those verbs leave lexically underspecified how many macroroles they take. It further offers a comparison between the proposed account and Ackerman & Moore's (2001) proto-role account and argues that those case (frame) alternations are better treated as macrorole/transitivity alternations than relational alternations.

1. Introduction

The aim of this paper is twofold: to provide a unified account of transitivity-driven case alternations as in (1)–(2); and to discuss an implication they have for linking theory in general. The referents of the non-subject arguments in (1a)–(2a) are arguably more "affected" than those in (1b)–(2b). Examples (1a,b) are taken from German, while (2a,b) are taken from Japanese:

(1) a. *Die*　　*Mutter*　　*schlug*　　*mich*　　*ins*　　*Gesicht.*
　　　 the.NOM　mother.NOM　hit.PAST　me.ACC　in.the.ACC　face.ACC

　　 b. *Die*　　*Mutter*　　*schlug*　　*mir*　　*ins*　　*Gesicht*
　　　 the.NOM　mother.NOM　hit.PAST　me.DAT　in.the.ACC　face.ACC
　　　 'The mother hit me in the face.' (German: Wierzbicka 1988: 202)

(2) a. *John-ga*　*Tom-o*　*hashir-ase-ta.*
　　　 John-NOM　Tom-ACC　run-CAUS-PAST
　　　 'John made Tom run'.

　　 b. *John-ga*　*Tom-ni*　*hashir-ase-ta.*
　　　 John-NOM　Tom-DAT　run-CAUS-PAST
　　　 'John had Tom run.' (Japanese)

Wierzbicka (1988: 202) observes that a few German contact verbs (e.g., *schlagen* "hit", *treten* "kick") allow their non-subject arguments to receive accusative or dative case when they denote an action directed toward a patient's body; the patient receives accusative case when the event is painful or it is difficult for the patient to ignore, while it receives dative case if the event is construed as being negligible or trivial. Furthermore, many researchers notice that dative-marked causees as in (2b) are potentially in control of their actions, while accusative-marked ones as in (2a) are not (Shibatani 1976; cf. Cole 1983; O'Grady 1991). In other words, the causee in (2b) is construable as having had an option of refusing the causer's request, while the causee in (2a) is not. The semantic contrast between (2a) and (2b) is made clear by inserting an adverb *muriyari* "against one's will, by force" in (2a,b) as in (3a,b):

(3)   a.   *John-ga   Tom-o   muriyari   hashir-ase-ta.*
           John-NOM   Tom-ACC   against.one's.will   run-CAUS-PAST
           'John made Tom run against Tom's will.'

      b.   *??John-ga   Tom-ni   muriyari   hashir-ase-ta.*
           John-NOM   Tom-DAT   against.one's will   run-CAUS-PAST
           'John made Tom run against Tom's will.'

Table 1 summarizes the relationship between the semantic contents and case marking in (2a,b):

Table 1.   Correlation between the semantic contents and case marking in (2)

		(2a)	(2b)
Transitivity-related Property	Affectedness of the Causee	More	Less
	Volitionality of the Causee	Less	More
Case Marking of the Causee		Accusative	Dative

Table 1 indicates that the more affected causee receives accusative case, while the less affected, the more volitional causee receives dative case. An analogous correlation holds in Korean and Spanish causative constructions in (4) and (5) as well:

(4)   a.   *John-i   Sue-lul   ttena-key   hay-ss-ta.*
           John-NOM   Sue-ACC   leave-CMPL   do-PAST-DEC
           'John made Sue leave.'

      b.   *John-i   Sue-eykey ttwuy-key   hay-ss-ta.*
           John-NOM   Sue-DAT   leave-CMPL   do-PAST-DEC
           'John had Sue leave.'   (O'Grady 1991: 171–172)

(5)   a.   *La   hice   entrar.*
           Her:ACC   made:1SG   enter
           'I made her enter'.

      b.   *Le   hice   entrar.*
           Her:DAT   made:1SG   enter
           'I had her enter.'   (Strozer 1976: 441)

Ackerman & Moore (2001) handle case alternations as in (1)–(5) by building on Dowty's (1991) concept of *proto-roles*, a cluster of semantic entailments denoted by verbs. They focus on case alternations on single arguments of verbs in accusative language and, as will be discussed later, propose to analyze many of these case alternations as reflections of changes in grammatical relations. I will instead propose to attribute these case alternations to changes in macrorole status and will suggest that this move enables us to accommodate a wider range of data including data from morphologically and syntactically ergative languages.

The rest of this paper is organized as follows. Section 2 provides a brief introduction to Role and Reference Grammar [RRG] (Van Valin & LaPolla 1997), the framework adopted in this paper. Section 3 begins with an examination of examples (2a,b), whose causees receive accusative or dative case. I will propose that introducing the concept of underspecification with respect to the number of macroroles allows us to provide a unified account of examples (1)–(5) and analogous examples from ergative languages. Section 4 will compare the present account with Ackerman & Moore's (2001) and will discuss a theoretical implication of the alternation phenomena for the linking theory. Section 5 will be a conclusion.

2.   Framework: Role and Reference Grammar

I assume that most readers are more or less familiar with RRG. Therefore, I will skip over the mapping between *logical structures* [LS] and *macroroles* [MR] and will focus on the relationship between macroroles and grammatical relations and the RRG view of transitivity.

MRs correspond to the two major arguments of a transitive verb [A, O], either on of which may function as the single argument of an intransitive verb [S]. They are actual relations which an argument may bear and form a representation independent of grammatical relation:

(6)   a.   John [SUBJ, ACTOR] hit Bill [DOBJ, UNDERGOER].
      b.   Bill [SUBJ, UNDERGOER] was hit by John [ADJUNCT, ACTOR].
      c.   Mary [SUBJ, ACTOR] ran into the room.
      d.   Jane [SUBJ, UNDERGOER] died after the election.

RRG derives grammatical relations from a *restricted neutralization* of macrorole distinctions and allows subject alone as the grammatical relation within the framework. I refer the reader to Van Valin & LaPolla (1997: Ch. 6) for detailed discussion.

Before I move on to an analysis of case alternations, a few words are in order about the RRG concept of transitivity, which is based on the number of macroroles as in (7):
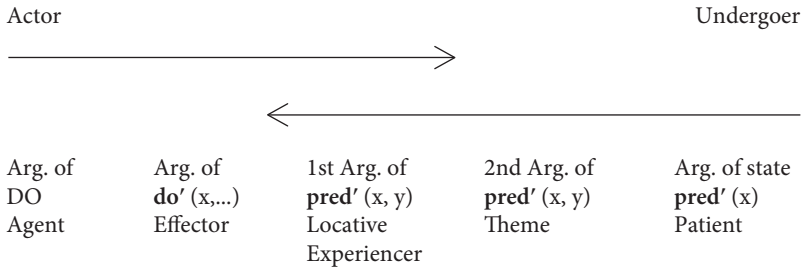
(7)   M-Transitivity: Transitivity in terms of Macrorole

      a.   Transitive   2 Macroroles   (actor and undergoer)
      b.   Intransitive   1 Macrorole   (actor or undergoer)
      c.   Atransitive   0 Macrorole

(8)   S-Transitivity: Transitivity in terms of Arguments

    a.   Ditransitive   3 Arguments
    b.   Transitive   2 Arguments
    c.   Intransitive   1 Argument

(7) states that single macrorole verbs are intransitive, while two macrorole verbs are transitive. This semantic definition stands in contrast to the traditional, syntactic definition of transitivity in (8). Comparing (7) with (8) reveals that two-place verbs are not necessarily transitive under the RRG definition of transitivity; two-place verbs may be classified as intransitive under (7). (9) and (10) are a summary of how macroroles are assigned in RRG:

(9)   Actor-Undergoer Hierarchy [AUH]:

Actor   Undergoer

$\longrightarrow$

$\longleftarrow$

Arg. of	Arg. of	1st Arg. of	2nd Arg. of	Arg. of state
DO	**do′** (x,...)	**pred′** (x, y)	**pred′** (x, y)	**pred′** (x)
Agent	Effector	Locative	Theme	Patient
		Experiencer		

["$\longrightarrow$" = increasing markedness of realization of LS argument as macrorole]

(10)   Default Macrorole Assignment Principles [DMAP]:

    a.   Number: the number of macroroles which a verb takes is less than or equal to the number of arguments in its LS:
        1.   If a verb has two or more arguments in its LS, it will take two macroroles.
        2.   If a verb has one argument in its LS, it will take one macrorole.

    b.   Nature: for verbs which take one macrorole:
        1.   If the verb has an activity predicate in its LS, the macrorole is actor.
        2.   If the verb has no activity predicate in its LS, the macrorole is undergoer.

Van Valin (1991) is the first to use the gap between semantic and syntactic transitivity to derive "quirky" case frames from a lexical feature which prespecifies the number of macroroles taken by a verb.[1] This is illustrated by a Japanese example (11):

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1.   Postulating the lexical feature [MR1] does not mean that there is no semantic motivation for the use of dative case on subject arguments of two-place verbs as illustrated in (11). The feature

(11) *John-ni   nihongo-ga   wakat-ta.*
     John-DAT   Japanese-NOM   understand-PAST
     'John understood Japanese.'

     S-Transitivity = 2
     M-Transitivity = 1
     LS: **understand′** (John, Japanese) [MR1]

The macrorole assignment in (11) proceeds as follows. The lexical feature [MR1] requires that the Japanese verb *wakaru* "understand" receives only one macrorole in violation of (10a1). The principle (10b2) requires the only macrorole to be an undergoer, since it has no activity predicate **do'** in its LS. The actor-undergoer hierarchy requires *nihongo* "Japanese" to be an undergoer, since it is ranked higher than *John* with respect to undergoer selection. The remaining argument *John* has no choice but to become a non-macrorole and receives dative case, the default case for non-macrorole arguments (Van Valin 1991).

Finally, I assume the following two sets of case marking constraints proposed elsewhere (e.g., Nakamura 1999). These violable constraints are designed to apply to core arguments alone and constitute an OT-style dominance hierarchy (Prince & Smolensky 2004), in which higher-ranking constraints have absolute priority over lower-ranking constraints:

(12) a.   Case Marking Constraints for Accusative Languages
        1.   Non-macrorole core arguments take DATIVE case.
        2.   Some argument takes NOMINATIVE case.
        3.   Undergoers take ACCUSATIVE case.
        4.   Actors take ERGATIVE case.

     b.   Case Marking Constraints for Ergative Languages
        1.   Non-macrorole core arguments take DATIVE case.
        2.   Some argument takes NOMINATIVE case.
        3.   Actors take ERGATIVE case.
        4.   Undergoers take ACCUSATIVE case.

3.   Proposal

3.1   Macrorole-based account

Let us begin with the case alternation in (2), repeated below for convenience:

(2)   a.   *John-ga   Tom-o   hashir-ase-ta.*
        John-NOM   Tom-ACC   run-CAUS-PAST
        'John made Tom run.'

---

is just an indication that there is no single set of semantic properties which serve to uniquely identify all of dative-marked subjects.

    b.   *John-ga*   *Tom-ni*   *hashir-ase-ta.*
        John-NOM   Tom-DAT   run-CAUS-PAST
        'John had Tom run.' (Japanese)

The easiest solution available within RRG would be to propose a diacritic account: to assume that the causative verb involves two distinct LSs in (13a,b), one with a lexical feature [MR1] and the other with no such prespecification:

(13)   a.   [**do′** (John, Ø)] CAUSE [**do′** (Tom, [**run′** (Tom)])]
       b.   [**do′** (John, Ø)] CAUSE [**do′** (Tom, [**run′** (Tom)])]   [MR1]

(10a1) requires that (13a) takes actor and undergoer in the absence of any lexical feature, under the assumption that it is the effector of the superordinate CAUSE which outranks the embedded effector for actor status (Van Valin 1993: 124).

    On the other hand, (13b) takes only one macrorole in violation of (10a1). The principle (10b1) dictates that the only macrorole should be an actor which is assigned to *John*, since (13b) has an activity predicate **do′** in it. The remaining argument *Tom* cannot become either actor or undergoer; it receives a non-macrorole status and the default dative case. (14a,b) describe how the macrorole assignments proceed in (2a,b), respectively:

(14)   a.   LS: [**do′** (John, Ø)] CAUSE [**do′** (Tom, [**run′** (Tom)])]

             Th.Rel.:   Effector   Effector

             MR: Actor   Undergoer

       b.   LS: [**do′** (John, Ø)] CAUSE [**do′** (Tom, [**run′** (Tom)])] [MR1]

             Th.Rel.:   Effector   Effector

             MR: Actor   Non-MR

    This diacritic account does describe the data, but it attributes the case frame of (2b) to a lexical feature [MR1] alone and thus fails to accommodate the correlation summarized in Table 1. The fundamental problem with this account is that it does not stop us from assigning the lexical feature [MR1] to the more transitive alternant rather than the less transitive one even if we know that the number of macroroles taken by (2a,b) is predictable from their semantic interpretations, as shown by Table 1, repeated below:

Table 1. Correlation between the semantic contents and case marking in (2)

		(2a)	(2b)
Transitivity-related Property	Affectedness of the Causee	More	Less
	Volitionality of the Causee	Less	More
Case Marking of the Causee		Accusative	Dative

This observation leads to a proposal in (15):

(15) Underspecification of the Number of Macroroles [tentative]:
Causative verbs which embed unergative verbs as their complements and have two alternative encodings as in (2) leave it underspecified how many macroroles they take: the more transitive alternant takes two macroroles, while the less transitive alternant takes one macrorole (in this case, actor).

The essential idea behind (15) is that in addition to the two familiar classes of two-place verbs which take two macroroles in compliance with the AUH and DMAP or one macrorole due to a lexical specification, there is a new third class of two-place verbs which leave it underspecified how many macroroles they receive. Furthermore, what causes a transitivity-motivated alternation has to be specified in such two-place verbs' lexical entries. There are a set of semantic properties which contribute to a prototype-based concept of transitivity as proposed by Hopper & Thompson (1980), but in the case of (2), the degree of affectedness is a relevant semantic parameter. This macrorole-based account extends to (4), (5), and any causative constructions which embed unergative verbs and display analogous case alternations on their causees:

(4) a. *John-i   Tom-ul   ttwuy-key   hay-ss-ta.*
John-NOM   Tom-ACC   run-CMPL   do-PAST-DEC
'John made Tom run.'

b. *John-i   Tom-eykey   ttwuy-key   hay-ss-ta.*
John-NOM   Tom-DAT   run-CMPL   do-PAST-DEC
'John had Tom run.'   (Korean: O'Grady 1991: 171–172)

(5) a. *La   hice   entrar.*
Her:ACC   made:1SG   enter
'I made her enter.'

b. *Le   hice   entrar.*
Her:DAT   made:1SG   enter
'I had her enter.'   (Spanish: Strozer 1976: 441)

We are now ready to consider whether this underspecification-based account extends to examples (1a,b) or not. Given that (1a) and (1b) differ in term of affectedness of the patient, we may extend (15) to the case alternation in (1) with no modification:

Table 2. Correlation between the semantic contents and case marking in (1)

	(1a)	(1b)
Transitivity-related Property (i.e., Affectedness of the Patient)	More	Less
Case Marking of the Patient	Accusative	Dative

Given this, we may propose to render (15) more general as in (16):

(16)   Underspecification of the Number of Macroroles [Final]:
       Multiple-argument verbs with two transitivity-driven alternative encodings
       leave it underspecified how many macroroles they take: the more transitive
       alternant takes two macroroles, while the less transitive alternant takes one
       macrorole.

3.2   Extensions to ergative languages

3.2.1   *Morphologically ergative languages*

I have so far applied the concept of underspecification to two-place verbs alone. It is
reasonable to ask at this juncture whether or not there is any three-place verb which
has a choice as to the number of macroroles it receives; the DMAP requires that three-
place verbs may receive either one or two macroroles if they are underspecified with
respect to the number of macroroles they receive.

In order to answer this question, it is interesting to have a look at case frame al-
ternations in Georgian (South Caucasian). Examples (17)–(18) illustrate case frame
alternations of two-place verbs, while (19)–(20) illustrate those of three-place verbs.
These case frame alternations are determined by verb classes and tense series in a
systematic way and require a principled treatment (Harris 1981):[2]

(17)   a.   *dedam*   *dabana*   *tavisi*   *švili.*
            mother-ERG   she-bathed-him-II-1   self's   child-NOM
            'The mother bathed her child.'

       b.   *deda*   *bans*   *tavis*   *švils.*
            mother-NOM   she-bathes-him-I-1   self's   child-DAT
            'The mother is bathing her child.'

(18)   a.   *kartulma enam*   *isesxa*   siṭqvebi.
            Georgian language-ERG   it-borrowed-it-II-3   words-NOM

            rusulidan.
            Russian-from

            'The Georgian language has borrowed words from Russian.'

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2.   The Roman numerals in the glosses in (17)–(20) indicate which tense series the corre-
sponding morpheme carries, whereas the Arabic numerals indicate which verb class the cor-
responding verb belongs to.

b. *kartuli   ena   sesxulobs   siṭqvebs*
Georgian language-NOM   it-borrows-it-I-3 words-DAT

rusulidan.
Russian-from

'The Georgian language borrows words from Russian.'

(19) a. *ninom   acvena   suratebi   gias.*
Nino-ERG   she-showed-him-it-II-1 pictures-NOM   Gia-DAT
'Nino showed the pictures to Gia.'

b. *nino   acvenebs   suratebs   gias.*
Nino-NOM she-shows-him-it-I-1 pictures-DAT Gia-DAT
'Nino is showing pictures to Gia.'

(20) a. *mamam   mzias   daantebina   cecxli.*
father-ERG Mzia-DAT he-caused-light-her-i-II-1 fire-NOM
'Father made Mzia light the fire.'

b. *mama   mzias   antebinebs   cecxls.*
father-NOM Mzia-DAT he-causes-light-her-it-I-1 fire-DAT
'Father makes Mzia light the fire.'   (Harris 1981: 27, 40, 42, 74–75)

Georgian has four verb classes and three time series and their combinations determine case marking patterns, as shown in Table 3 (Harris 1981):

Table 3. Georgian case marking (adapted from Van Valin 1990: 240)

	Series I *	Series II	Series III
Class 1: Accomplishment	NOM-DAT	ERG-NOM	DAT-(NOM)
Class 2: Achievement, State	NOM-(DAT)	NOM-(DAT)	NOM-(DAT)
Class 3: Activity	NOM-(DAT)	ERG-(NOM)	DAT-(NOM)
Class 4: State	DAT-(NOM)	DAT-(NOM)	DAT-(NOM)

*Series I refers to "present tense", which represents present time, incomplete aspect, either continuous or non-continuous aspect, and indicative mood, while Series II refers to "aorist", which represents past time, complete aspect, and indicative mood.

Harris (1981) notes that two-place verbs which belong to either Class 1 or Class 3 exhibit case frame alternations. What is peculiar about Georgian is that it also allows a tense-aspect contrast (i.e., the one between "present tense" and "aorist") to control these case frame alternations.

    Let us begin with examples (17)–(18). These constructions bear "ERG-ABS" case frames in Series II (aorist), while they bear "ABS-DAT" case frames in Series I (present). If we may reduce the Georgian tense-aspect system to a contrast between perfectivity and imperfectivity, we may summarize the correlation between the Georgian

tense-aspect system and case frames carried by two-place verbs belonging to Class 1 or 3, as in Table 4:

Table 4. Correlation between the aspectual contrast and case frames in (17)–(18)

	(17a, 18a)	**(17b, 18b)**
Aspectual Property	Perfective ("aorist")	Imperfective ("present")
Transitivity	More transitive	Less transitive
Case Frame	ERG-NOM	NOM-DAT

Given Table 5, we may assume that (17a,b) have (21a,b) as their LSS, respectively:

(21) a. $\langle_{\text{ASPECT}}$ PERF $\langle[\textbf{do}'$ (mother, Ø)] CAUSE [$\textbf{do}'$ (child, [$\textbf{bathe}'$ (child)])]$\rangle\rangle$
      b. $\langle_{\text{ASPECT}}$ IMPERF $\langle[\textbf{do}'$ (mother, Ø)] CAUSE [$\textbf{do}'$ (child, [$\textbf{bathe}'$ (child)])]$\rangle\rangle$

Given that perfective clauses are more transitive than the imperfective counterparts, I propose that the number of macroroles taken by these Georgian verbs is underspecified and that the macrorole assignments in examples (17a,b) proceed as in (22a,b), respectively:

(22) a. LS: $\langle_{\text{ASPECT}}$ PERF $\langle[\textbf{do}'$ (m, Ø)] CAUSE [$\textbf{do}'$ (child, [$\textbf{bathe}'$ (child)])]$\rangle\rangle$

          Th.Rel.:   Effector   Effector

          MR: Actor   Undergoer

      b. LS: $\langle_{\text{ASPECT}}$ IMPERF $\langle[\textbf{do}'$ (m, Ø)] CAUSE [$\textbf{do}'$ (child, [$\textbf{bathe}'$ (child)])]$\rangle\rangle$

          Th.Rel.:   Effector   Effector

          MR: Actor   Non-MR

The above account extends readily to three-place verbs including causatives of transitive verbs. These three-participant constructions bear "NOM-DAT-DAT" case frames in Series I, while they bear "ERG-DAT-NOM" case frames in Series II. Like (17) and (18), (19) and (20) display a case frame alternation driven by the aspectual contrast between perfectivity (aorist) and imperfectivity (present). The underspecification-based account suggests that (19a) takes two macroroles, while (19b) takes only one macrorole, since (19a) is more transitive than (19b) (Tsunoda 1981). (23a,b) show how the macrorole assignments in (19a,b) proceed, respectively:

(23)   a.   LS: ⟨$_{\text{ASPECT}}$ PERF ⟨[**do′** (N, Ø)] CAUSE [INGR **see′** (Gia,   pictures)])]⟩⟩

        Th.Rel.:   Effector   Experiencer Theme

        MR: Actor   Non-MR Undergoer

      b.   LS: ⟨$_{\text{ASPECT}}$ IMPERF ⟨[**do′** (N, Ø)] CAUSE [INGR **see′** (Gia,   pictures)])]⟩⟩

        Th.Rel.:   Effector   Experiencer Theme

        MR: Actor   Non-MR Non-MR

Application of the set of case marking constraints in (12b) to (23a,b) yields the case frames in (19a,b), respectively. An analogous account holds for the alternation in (20) as well.

Georgian is not an isolated example. Adyghe (Northwest Caucasian) provides another illustration of transitivity-driven case frame alternations in morphologically ergative languages:

(24)   a.   *Jeɣedʒakeʷ′e-m*   *s'ale-r*   *jewisijas.*
        teacher-ERG   youth-ABS admonished

      b.   *Jeɣ edʒakeʷ′e-r*   *s'ale-m*   *jewisijas.*
        teacher-ABS   youth-OBL admonished
        'The teacher admonished the youth.'   (Catford 1975)

Native Caucasian linguists have traditionally termed two-participant constructions such as (24) *labile constructions* (e.g., Hewitt 1982). Adyghe marks transitive subjects with the ergative suffix, which is also used to mark a variety of oblique NPs. Catford (1975) reports that the action of admonishing in (24b) only touched on the young man, while the admonishment in (24a) caused an essential change in him. This observation enables us to subsume (24) under the scope of my underspecification-based account in (16).

Finally, Warlpiri (Pama-Nyungan) permits a class of impact verbs to display analogous case alternations, as illustrated by (25a,b) (Laughren 1988: 217):

(25)   a.   *Janganpa-rna-jana*   *paka-rnu*   *ngajulu-rlu.*
        possum: NOM-1SG-3PL   chop-PAST   1SG-ERG
        'I chopped out the possums.'

      b.   *Janganpa-ku-rna-jana*   *paka-rnu*   *ngajulu-rlu.*
        possum-DAT-1SG-3PL   chop-PAST   1SG-ERG
        'I chopped for possums.'   (Warlpiri: Laughren 1988)

...

Both (25a) and (25b) describe a situation in which the agent hit an ax against a tree in which possums were living. A critical difference arises with respect to whether the possums were caught or not; (25a) entails that they were actually caught, while (25b) does not. Other impact verbs that permit similar case alternations with similar semantic effects include *jarnti-rni* "carve", *pangi-rni* "dig", and *panti-rni* "pierce" (Laughren 1988: 218).

The fact that the underspecification-based account is able to accommodate those data from Georgian, Adyghe, and Warlpiri in such a way to capture the semantic motivations behind the case frame alternations in a unified way amply demonstrates the merit of the proposal to underspecify the number of macroroles in verbs' lexical entries.

3.2.2   *Syntactically ergative languages*

We have so far handled case (frame) alternations in accusative and morphologically ergative languages. I also would like to show that the underspecification-based account extends with no modification to case frame alternations in Kalkatungu (Pama-Nyungan), a syntactically ergative language, which selects absolutive/nominative-marked arguments as syntactic pivots:

(26)   a.   *tuku-yu   tuar   itʲʲayi.*
              dog-ERG   snake:ABS   bite
              'The dog bites/bit the snake.'

        b.   *tuku   tuar-ku   itʲʲayi.*
              dog:ABS   snake-DAT   bite
              'The dog is biting the snake.'   (Blake 1982: 86)

(27)   a.   *Kupaŋuru   caa   kalpin-ku   lai-mina.*
              old.man:ABS   here   young.man-DAT   hit-IMPERF
              'The old man is hitting the young man.'

        b.   *Kupaŋuru-tu   caa   kalpin   lai-na.*
              old.man-ERG   here   young.man:ABS   hit-PAST
              'The old man hit the young man.'   (Blake 1976: 286)

The contrast between examples (26a) and (26b) comes down to whether they are perfective or imperfective: the verb *itʲʲayi* "bite" lexicalizes this aspectual contrast. Blake (1982) reports that (26a) is favored when the speaker refers to an action being directed toward a goal, as opposed to one which has been completed. An analogous correlation obtains in (27). This aspectual contrast is analogous to the one observed in the Georgian examples discussed above.

I have shown in this section that my underspecification-based proposal in (16) subsumes case frame alternations in both morphologically and syntactically ergative languages under its scope. Ackerman & Moore (2001) do not discuss these alternation phenomena in ergative languages and this is where a critical difference between the present account and their account emerges. I will turn to their comparison in the next section.

4.   Comparison

We are now in a position to compare the present account with Ackerman & Moore's (2001) account. They build on Dowty's (1991) proposal to distinguish two thematic roles, proto-agents and proto-patients, which are given in (28). Dowty assumes that these entailments arise from generalizations over subject and object selection and that they are virtual in nature:

(28)   a.   Proto-Agent Properties
1.   volitional involvement in the event or state
2.   sentience and/or perception
3.   causing an event or change of state in another participant
4.   movement relative to position of another participant
5.   exists independently of the event named by the verb

   b.   Proto-Patient Properties
1.   undergoes change of state
2.   incremental theme
3.   causally affected by another participant
4.   stationary relative to position of another participant
5.   does not exist independently of the event, or not at all

Dowty also claims that (28) are the actual content of what has been termed thematic relations in the literature.

Given the two sets of proto-properties in (28), Dowty (1991: 562) proposes (29) as a determinant of grammatical relation assignment in transitive constructions:

(29)   Syntagmatic Argument Selection Principle [SASP]:
In predicates with grammatical subject and object, the arguments for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the direct object.

Given a set of co-arguments with certain proto-properties, the SASP serves as a linking principle which associates verbal arguments possessing certain proto-properties with subjects and direct objects in accusative languages.

Ackerman & Moore (2001) go on to propose (30a,b) together with the SASP, in order to account for relational alternations in two-participant clauses such as in (1) and (2):

(30)   a.   Paradigmatic Argument Selection Principle [PASP]:
If a non-subject argument participates in a semantic alternation and that alternation is reflected in grammatical relation encoding, then the alternant which is the most prototypically patient-like is encoded higher on the Relational Hierarchy than the other alternants.

   b.   Relational Hierarchy: DO > IO > OBL

The PASP captures the following intuition about case alternations as in (1) and (2):

(31)   When a non-subject argument exhibits a semantic alternation, then an alternant
       with a more affected interpretation will be realized as a grammatical relation
       that is higher on the Relational Hierarchy than the relational encoding of the
       non-affected alternant.

What is innovative about Ackerman and Moore's proposal is that they use almost the
same set of proto-properties[3] to account for paradigmatic alternations as well as syn-
tagmatic alternations, i.e., subject and object selection.

However, Ackerman & Moore's (2001) account runs into a problem when
they are confronted with data from syntactically ergative languages. Japanese
examples (2a,b) involve an alternation between *direct object* and *indirect object*,
while the Kalkatungu examples (26a,b) involve an alternation between *subject*
and *indirect object* (or some other oblique element). There seems to be no way for
them to provide a unified account of these two examples in terms of grammatical
relation, but the present account has no problem with the Kalkatungu examples;
they involve a semantic alternation between *undergoer* and *non-macrorole*, just
like (2) and the other examples of case (frame) alternations observed in accusa-
tive and morphologically ergative languages.[4] The two accounts are contrasted
in Tables 5 and 6:

Table 5. Japanese vs. Kalkatungu in terms of macrorole alternation

		Transitivity	Macrorole assignment
Syntactically Accusative Languages	Japanese example (2a)	High	Actor + Undergoer
	Japanese example (2b)	Low	Actor + Non-macrorole
Syntactically Ergative Languages	Kalkatungu example (26a)	High	Actor + Undergoer
	Kalkatungu example (26b)	Low	Actor + Non-macrorole

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3.   Ackerman & Moore (1999) propose to add "telicity" to the list of proto-properties which are
originally proposed by Dowty (1991).

4.   One may point out that it is not fair to criticize Ackerman & Moore (2001) only in terms of
their treatment of case alternations displayed by two-place verbs, since they also try to handle
case alternations displayed by causative constructions embedding transitive verbs. More specifi-
cally, they focus on two-way or three-way case alternations on their causees. There is no space
here for sketching how to handle those case alternations on the causees, but see Van Valin &
LaPolla (1997: 581–590) for a possible line of exploration.

Table 6. Japanese vs. Kalkatungu in terms of relational alternation

		Transitivity	GR assignment
Syntactically Accusative Languages	Japanese example (2a)	High	SUBJ + DO
	Japanese example (2b)	Low	SUBJ + IO
Syntactically Ergative Languages	Kalkatungu example (26a)	High	DO + SUBJ
	Kalkatungu example (26b)	Low	SUBJ + IO (OBL)

5.   Conclusion

I have proposed in this paper that underspecifying the number of macroroles taken by multiple-argument verbs makes it possible to provide a unified account of the wide range of case (frame) alternations in both accusative and ergative languages. This underspecification-based account has two consequences. First, it allows us to capture the transitivity-driven case (frame) alternations in both syntactically accusative and ergative languages in a unified way. Apart from the Warlpiri examples, tying case marking constraints to macrorole status as in (12) allows us to understand all the alternations discussed so far in this paper as a semantic alternation between undergoer and non-macrorole.

The second consequence is theoretical in nature. As I have touched on earlier in this paper, Ackerman & Moore (2001) attempt to handle case alternations in syntactically accusative languages (with no mention of ergative languages). The reason they fail to address the question of how to extend their relational account to syntactically ergative languages is that they assume that generalized semantic roles are virtual in nature and have no independent representation in the syntax-semantics interface, but assuming so makes it next to impossible for them to provide a unified account of paradigmatic alternations in syntactically accusative and ergative languages.

Van Valin (1999) addresses the question of whether generalized semantic roles have an independent representation in the linking theory and argues that they constitute actual relations which an argument may bear and play an important role in the formulation of morphosyntactic rules. Van Valin (1999) comes up with three morphosyntactic constructions, obligatory control, reflexive binding, and applicativization, in support of his claim that macroroles are actual relations, and not virtual ones. He goes on to argue that their unified account is available under the assumption that macroroles are actual relations which may be referred to by morphosyntactic rules. I would like to add to these three constructions the case (frame) alternations discussed in this paper as another phenomena which lend a further support to this line of argumentation and constitute a counterargument against Dowty's (1991) and Ackerman & Moore's (2001) claim that generalized semantic roles are generalizations

over subject and object selection in the syntax-semantics interface and have no independent representation.

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Syntactic and morphological categories

Unification and separation in a functional theory of morphology

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This paper offers the initial design for a functional theory of morphology and addresses the question of how much unification or separation of domains and units is required in such a theory. Given that morphology is largely driven by principles that also rule syntax and semantics, the main thrust of this proposal is that the interaction between morphology and other areas of the theory can be adequately accounted for by the combination of three descriptive-explanatory resources: layered structures, templates and constructions. Other descriptive-explanatory principles such as feature percolation and the characteristics of bases and adjuncts remain specifically morphological. Unification and separation in morphology must be carried out on functional grounds. Moreover, Old English evidence shows that no strict separation can be postulated, either between morphology and the rest of the theory or among the different morphological processes.

1. Introduction

This paper contributes to the debate over the nature and mechanisms of morphology that is currently going on in the functional school in general and in Role and Reference Grammar (henceforth RRG) in particular, firstly by taking issue with the external motivation of morphology and secondly by addressing the crucial question of how much unification or separation of domains and units is required in functional morphology.[1]

This paper is organised as follows: in section 2, I review previous work in RRG morphology and focus on the lexicon; in section 3, I engage with the problem of the unification vs. separation of domains and units; in section 4, I advance a proposal for the principles and rules that govern the insertion of elements into the slots of morphological templates; and, by way of conclusion, I summarise the main contibutions and

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make some suggestions regarding possible future work along the research lines opened up by this paper.

The language of analysis is Old English (henceforth OE), given its morphological richness: indeed, it displays full inflections and is endowed with numerous morphologically-related word families, as well as a fair degree of transparency in derivation (Kastovsky 1992). The data upon which the proposal for an OE morphological template rests have been retrieved from *Nerthusv4* (Martín Arista *et al.* forthcoming), a database of OE lexical derivation that contains ca. 30,000 entries.

2.   Morphology and the functional lexicon

Mairal & Cortés (2000–2001) have made two significant claims concerning the nature of a functional lexicon and the relationship between morphology and other components of the theory, while Everett (2002) has advanced a number of guidelines that may lay the foundations of a theory of morphology for RRG. In this section, I elaborate on Mairal & Cortés's parallel architecture of the lexicon and explore the implications and consequences of Everett's guidelines.

Some generative theories of language, both of a formalist and a functionalist persuasion, maintain that the rules of word-formation are the same as those of phrase and clause formation. Baker (1988) and Lieber (1992) on the one hand, and Dik (1997a) on the other, represent this theoretical stance in the transformationalist and the functionalist school, respectively.[2] These views must be considered in the wider context of the two extreme positions regarding the existence of morphology and its relations with other areas of grammar: the lexicalist position, which denies interaction between morphology and syntax, but admits the existence of morphology; and the syntacticist position, which denies the existence of morphology while reducing all morphological phenomena to syntactic operations. I review these questions in turn.

As for the existence of morphology, I concur with authors such as John Anderson (1992) or Baker (2003), who consider that morphology exists if, in spite of the interaction between word and sentence structure, some principles remain specifically morphological. In Baker's (2003: 280) words, "once the syntactically predictable morphology has been stripped away, there remains a residue of morphology that seems to have nothing to do with syntax". Baker mentions non-productive derivation and language-specific aspects of inflection. In this paper, I add feature percolation and the morphological properties of bases to this list. If morphology cannot be entirely reduced to syntax, it follows that a functional theory of language must allow in a certain amount of morphology, but the question which remains is whether it is independent from other

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2.   Note that for Lieber (1992) words contain heads, complements and specifiers, whereas Dik (1997a) remarks that the rules that govern clause formation also govern word-formation.

areas of grammar. The lexicalist claim that morphology is completely independent from syntax must be interpreted in the general context of a modular theory of language, that is, a theory that postulates the existence of different components or modules, in such a way that the output from the lower component constitutes the input to the higher component in the derivation of multistratal theories, such as transformational grammar, or in the expansion of monostratal theories like Functional Grammar.[3] In this respect, I follow Van Valin & LaPolla (1997) in making no claim for modularity and, consequently, admitting no interfaces. In a theory without modules and interfaces, parts of the theory interact with one another in a pervasive way. In this proposal, trees, templates and constructions account for certain aspects of this interaction.

The next step is to decide where morphology should be placed.[4] The position that I adopt in this respect, following Mairal & Cortés (2000–2001) and Everett (2002), is that morphology is the product of the interaction between the lexicon on the one hand and pragmatics, semantics and syntax on the other. In line with Dik (1997a), I define the lexicon as the inventory of predicates and the rules that derive non-basic predicates from basic predicates. This definition calls for further explanation in the context of this proposal:

1. Categories are functional labels. I use categorial labels because categorial information plays a major role in derivational morphology. Moreover, of the four major lexical categories, at least nouns and verbs are universal. I subscribe to the RRG view that the function of categories in discourse has explanatory status. Categories fall into two types: lexical categories and grammatical categories. Lexical categories combine with other lexical categories, that is to say, they exhibit relations of complementation. Grammatical categories, on the other hand, distribute across one another and across lexical categories to form paradigms.[5] A functional definition of the major lexical categories must stress their behaviour in discourse: the major lexical category to which potentially referential predicates belong is the Noun; the one to which predicates that express quality or relation belong is the Adjective; and the one to which predicates that express state or process (including activity, achievement and accomplishment) belong is the Verb.[6]

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3. Interfaces relate modules to each other and satisfy a number of well-formedness conditions. See Jackendoff (1997).

4. See Anderson (1982, 1985a) on the long debate over the question of the independence of morphology that has taken place in the transformationalist school.

5. Adverbs are often accepted as lexical categories in the literature, especially in the FG school (Hengeveld 1992; Mackenzie 2001; Martín Arista 2003; Martín Arista & Ibáñez Moreno 2004). See also Butler (2003). Some authors like Croft (1991) or Baker (2003) deny the adposition the status of lexical category.

6. According to Dik (1997a: 194) the noun is primarily the head of the term (noun) phrase. I do not introduce the parameter of headedness in the functional definition of the noun if it

2.   The lexicon is productive (Zwicky 1992). In the framework to which this discussion contributes, lexical productivity is motivated externally: pragmatics, semantics and syntax partially govern word-formation.

3.   The entries of the lexicon are lexemes. Lexemes are free or bound. Free lexemes belong to the major lexical categories. Bound lexemes are affixes that take part in derivational processes. Fully-specified lexemes constitute predicates. Predicates display, at least, the following information: categorial and combinatorial properties, the different forms, the features that motivate such forms, the stems, and the phonological representations. Morphemes are available for insertion as operators into phrases or clauses and their final form is stated by constructive templates. No distinction is drawn, therefore, between free lexemes and derivational affixes since both have complementation properties. The main distinction is that between lexemes, which have the property of complementation, and grammatical morphemes, which possess the property of distribution.

4.   Derivational affixes are lexemes. As for the question of the status of affixes, there is no agreement in the literature, which is predictable, given that the choice of units has far-reaching methodological implications as well as generalised theoretical consequences. Lieber (1992), for example, argues that affixes are lexemes, whereas Beard (1995) denies them lexical status and identifies them with grammatical categories. In the functionalist camp, Mairal & Cortés (2000–2001), following the path of Dik (1997a: 54), have put forward a parallel architecture for primitive and derived lexical items. The parallelism basically involves the claim that affixes are listed in the lexicon along with basic predicates and are provided with categorial and combinatorial information.[7]

Everett (2002) offers a blueprint of a morphological theory for RRG in a proposal that can be summarised as follows:

1.   RRG morphology is inferential realizational: rules specify the pronunciation of words, which are stems plus features.
2.   The maximal unit of morphology is the Word.
3.   There are no derivations.
4.   Word structure can be shaped or manipulated by syntax, semantics and/or pragmatics.

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does not play any role in the definition of the other major lexical categories. I also avoid theory-internal definitions of categories like Baker's (2003: 290): nouns c-command an element with a shared index.

7.   See also Lehrer (2000), who explores the semantic similarities between affixes and lexemes and reaches the conclusion that English affixes show some of the semantic properties typical of lexemes, namely polysemy, synonymy and antonymy.

5. The basic theoretical parallel established is between the Layered Structure of the Clause and the Layered Structure of the Word.
6. Derivation involves the combination of nuclei whereas inflection is the result of adding arguments to a Nucleus.
7. Lexical integrity holds as regards derivation: syntax cannot see into the Core of the Word.

These guidelines contain certain overt theoretical choices and imply a number of tacit assumptions that deserve some comment. To begin with, the domain of morphology is the word.[8] This is not very far from classical proposals like Halle's (1973) or Aronoff's (1976), except that, in line with Halle (1973) and unlike Aronoff (1976), stems, instead of words, are the base of morphological processes. More recent transformational analyses, like Zwicky's (1986), also rely on the word, whereas others, such as DiSciullo and Williams (1987) and Beard (1995), opt for the morpheme. This theoretical choice of unit has a number of implications that constitute the hard core of any morphological theory. Indeed, much of the discussion on morphology in the last thirty years has revolved around this question.[9] To continue with Everett's (2002) guidelines, there are no derivations. In the third place, stating that Word structure can be manipulatad by syntax, semantics and/or pragmatics is in accordance with the organization of the theory of RRG, but it entails the separation of derivation and inflection: syntax, semantics and pragmatics cannot see into the internal structure of words, but they do see inside the external structure of words. This follows in the track of split morphology (Stephen Anderson 1992). In the fourth place, to generalise the Layered Structure of the Clause to the Word is in accordance with the linguistic tradition that for a long time has recognised interaction between morphology and syntax; and, no less importantly, it seems a logical step considering that RRG has generalised the Layered Structure of the Clause to the phrase.

3.   Unification vs. separation: Lexical integrity in OE

Summarising the previous section, we see that Mairal & Cortés (2000–2001) and Everett (2002) coincide in uniting derivational affixes and free lexemes for functional reasons. Everett (2002) unifies inflection and derivation on functional grounds since both contribute meaning to the word, while separating them on a structural basis, given that inflection is the combination of stems and features and derivation the combination of stems. In this section I further explore the question of unification vs. sepa-

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8.   Everett (2002) might have considered phonological words whereas this proposal is centered on grammatical words. On the difference, see Dixon & Aikhenvald (2002).

9.   See Anderson (1988) and Spencer (1991) for a more detailed account.

ration of units and domains in the light of OE data, which challenge the hypothesis of lexical integrity, whether it is understood as visibility or as relative ordering.

For several decades, the heart of the morphological discussion in the transformationalist tradition has been what the status of morphology is and, as a result, what sort of interaction is allowed between morphology and other components or subcomponents of the grammar. To quote just two opposite proposals, Di Sciullo & Williams (1987) deny any type of interaction between morphology and syntax whereas Zwicky (1986) allows for a considerable degree of interaction. This debate is a consequence of the central tenet of transformationalist morphology, namely that lexical integrity should guarantee that the rules of syntax do not make reference to morphology. In other words, lexical integrity is the morphological counterpart of the principle of the autonomy of syntax, which prevents syntactic rules from making reference to non-syntactic information.[10]

OE resists any ordering of the morphological processes of inflection, affixation and compounding with respect to one another; and, however restrictedly, lets semantics and pragmatics see into word-formation.[11] In brief, OE does not conform to lexical integrity.

Considering the relative ordering of morphological processes, the preliminary question arises of whether derivation (in a general sense, including compounding) is recursive or not. Lexical derivation is recursive in OE and, therefore, lexical integrity cannot be considered a kind of constraint on recursivity. In other words, derivation feeds derivation and compounding feeds compounding, as can be seen, respectively, in examples (1a) and (1b):

(1)   a.   *hreow* 'sorrow': *hreowan* 'make sorry': *ofhreowan* 'cause or feel pity'
       b.   *here-path* 'road': *ceaster-here-path* 'high road'

Lexical integrity does not follow from the relative ordering of morphological processes: inflection feeds derivation, as in (2a); inflection feeds compounding, as in (2b); affixation feeds compounding, as in (2c); and compounding feeds affixation, as in (2d).

(2)   a.   *drincan* 'drink' (past participle *druncen*): *ofer-drincan* 'get drunk':
             ofer-drunc-en 'drunkenness': *ofer-drunc-en-nes* 'drunkenness'
       b.   *drincan* 'drink': *druncen* 'drunkenness': *druncmennen* 'drunken maidservant'

---

10.   Ackema & Neeleman (2003: 124) gather three types of empirical evidence in favour of lexical integrity: parts of words cannot be moved out of the word; parts of words cannot be moved internally to the word; words cannot be formed by head-to-head movement. See Haspelmath (2002) and Aronoff & Fudeman (2005).

11.   See also den Dikken (2003), who has put forward a checking approach to syntactic word-formation.

    c.   *gereordung* 'meal': *æfen-gereordung* 'supper'

    d.   *hearm* 'evil': *hearmcweðan* 'speak evil of': *hearmcwiðol* 'evil-speaking': *hearmcwiðolian* 'speak evil of'

To these examples, the most frequent situation of compounding and derivation feeding inflection could be added. I am taking the line that productive inflectional forms are generated before derivation. If the opposite line is taken that these forms are fossilised and ready as such for derivation, the argument does not hold as regards inflection feeding derivation and compounding. But even if this were the case, derivation and compounding would still interact in very complex ways and it would not be possible to establish a relative ordering of morphological processes that justified lexical integrity in the light of OE data.

So far, lexical integrity has been discarded, at least for OE, either as a constraint on recursivity or as relative ordering. When we turn to integrity as visibility, Everett (2002) states that syntax, semantics and pragmatics have access to inflection in RRG morphology. As an illustration of this point, suffice it to say that in OE, certain verbs that take a genitive or a dative object in the active construction, such as *helpan* "help", preserve the oblique case in the passive construction. In (3a) the dative marking of the second argument of the active construction has been kept in the passive; and in (3b) the genitive has been kept in the passive:

(3)   a.   ⟨*Paris* Ps.9.18⟩ (van Kemenade 1997: 335)

        ... ðæt eallum folce   sy gedemed   beforan   ðe
        ... that all people DAT be judged   before   you
        '... that all the people be judged before you'

    b.   ⟨*Bo.* 67.11⟩ (Denison 1993: 104)

        For ðæm   se   ðe   his   ær   tide ne   tiolað,
        for that.cause he who him GEN before time does not provide

        ðonne bið his   on tid   untilað
        then   is   he GEN in   time unprovided

        'Whoever does not provide himself beforehand will be unprovided when the time comes'

As a tentative argument in favour of semantics seeing into derivation, we may take the phenomenon of negation. Given that OE allows double negation, both syntactic and lexical, one might hold that the logic of negation is attracted from Clause level to Word level in expressions like:

(4)   ⟨*Exodus*, 34.10⟩ (Haeberli & Haegeman 1999: 105)
    Ic wyrce ða tacnu   ðe   næfre nan man ne geseah ær   on
    I do   the miracles that never no   man not saw   before in

    nanum   lande
    no   land

    'I will do miracles that no man has ever seen before in any land'

It could be the case that the internal structure of the word attracts negation if the word is under the scope of negation, irrespective of the domain of negation (predicate-clause-sentence). As regards pragmatics seeing into derivation, the existence of morphological diminutives might be an argument in favour of this claim. Some OE morphological diminutives with the suffix *-incel* are given in (5):

(5)   a.   *bog* 'bough': *bogincel* 'small bough'
      b.   *cofa* 'chamber': *cofincel* 'little chamber'
      c.   *lið* 'joint': *liðincel* 'little joint'

Although it must be admitted that the empirical evidence provided against lexical integrity as a restriction on recursivity and as relative ordering is more compelling than the data challenging lexical integrity as visibility, I hope to have shown that no strict separation can be postulated in OE, either between morphology and the rest of the theory or among the different morphological processes.

4.   Layered structures, templates and constructions in functional morphology

In this section I propose an initial design for a functional theory of morphology. The main thrust of this proposal is that the interaction between morphology and other areas of the theory can be adequately accounted for by the combination of three descriptive-explanatory resources: layered structures, templates and constructions. This proposal draws on the structural-functional tradition of linguistics (Dik 1997a,b; Van Valin & LaPolla 1997; Van Valin 2005); the Layered Structure of the Clause (Foley & Van Valin 1984; Hengeveld 1989; Rijkhoff 2002); the tradition of Word Syntax (Marchand 1969; Selkirk 1982; Sproat 1985; Baker 1988; 2003; Lieber 1992, 2004); and functional morphology (Dik 1997a,b; Mairal & Cortés 2000–2001; Everett 2002; Cortés forthcoming).

In the first part of this section I address two preliminary questions: the inventory of morphological processes and the features that percolate in such processes.[12] So far, I have included compounding within morphological processes, along with affixation and inflection. At this point I should like to introduce a word of caution. In the first place, OE makes use of other processes of word-formation: zero derivation and category extension are recurrent in OE. These two phenomena are illustrated in turn in (6a) and (6b):

(6)   a.   *riht* 'right': *riht* 'what is right'
      b.   *acan* 'ake': *ece* 'pain' (Kastovsky 1968)

---

12.   Although I have grouped Selkirk's and Lieber and Baker's work, it must be noted that Baker (1988) and Lieber (1992) generate compounds productively whereas Selkirk (1982) does not.

And, secondly, the inclusion of productive compounding within morphology increases the interaction of morphology and syntax. Apart from this theoretical reason, there is abundant empirical evidence of category change in OE, of which (7) is representative:

(7) a. *adloma* 'one crippled by fire' (noun + adjective)
     b. *ælmyrca* 'one entirely black, Ethiopian' (adjective + adjective)
     c. *ætfeng* 'attaching' (adposition + verb)

Example (8) demonstrates that category is a morphological feature that must be projected (up a branch of the tree) or that must percolate (move from one branch to another) in order to keep this relevant information throughout the representation. The other morphological feature that can percolate is gender. Indeed, in (8), the gender of the compound does not coincide with the gender of the base (rightmost element), as is predictable in a prefield language like OE:

(8) a. *alorrind* 'alder-bark' (masculine, from feminine base and masculine adjunct)
     b. *æfengereord* 'evening meal' (neuter, from feminine base and neuter adjunct)
     c. *boldgetimbru* 'houses' (neuter, from neuter adjunct and feminine base)

The fundamental theoretical consequence of the empirical data contained in examples (7) and (8) is that the relevant morphological information is not always provided by the rightmost element of the compound. On the contrary, the adjunct of compounds can contribute the feature of category of gender. This situation requires that gender features are allowed to percolate.

Along with the percolation of features, a morphological theory allowing interaction of morphology with other areas of the theory requires word functions. As in previous work in RRG morphology, this section analyses the Complex Word as a structure containing elements and relations and generalises the Layered Structure of the Sentence to Word structure through Phrase structure. On the other hand, there are three substantial differences with respect to Mairal & Cortés and Everett: first, Mairal & Cortés (2000–2001) and Cortés (forthcoming) draw on Marchand (1969) as regards the inventory of word functions: determinant and determinatum. This inventory is not distinctive enough and, moreover, does not allow direct interaction with syntax and semantics. Therefore, I adopt the inventory of Van Valin & LaPolla (1997). Second, Everett (2002) places inflection in the Periphery of the Word. As I see it, the existence of segments that perform both an inflective and a derivative function probably conspires against the concept of peripheral inflection. Additionally, I opt for the general organization of the Layered Structure of the Clause, in which inflection is accounted for in terms of operators attached to different layers of the Clause, the Phrase and the Word. And third, Mairal & Cortés (2000–2001) and Everett (2002) explain derivation (affixation and compounding) as a combination of nuclei. I introduce the layer of the Complex Word containing the layer of the Word, with free and bound lexemes in semantically and syntactically motivated structures. As a consequence of these

differences, morphological nexus and juncture varies with respect to previous work, particularly Mairal & Cortés (2000–2001).

To give the overall picture, the semantic domains of the Word include the Nucleus, the Core, the Word and the Complex Word. Structurally speaking, the node Word dominates the nodes Core and Nucleus. The node Word directly dominates the node Core and the node Core, in turn, directly dominates the node Nucleus. Semantic domains have a layered structure in such a way that outer layers include the inner ones. Each layer has its own operators, scope over outer layers implying scope over the inner layers. Figure 1 represents the Layered Structure of the Word as applied to a predicate of the category alpha:

$$\text{WORD}_\alpha$$
$$|$$
$$\text{CORE}_\alpha$$
$$|$$
$$\text{NUCLEUS}_\alpha$$
$$|$$
$$\text{PREDICATE}_\alpha$$
$$|$$

NUC OPERATORS $\longrightarrow$ NUCLEUS
$$|$$
CORE OPERATORS $\longrightarrow$ CORE
$$|$$
WORD OPERATORS $\longrightarrow$ WORD
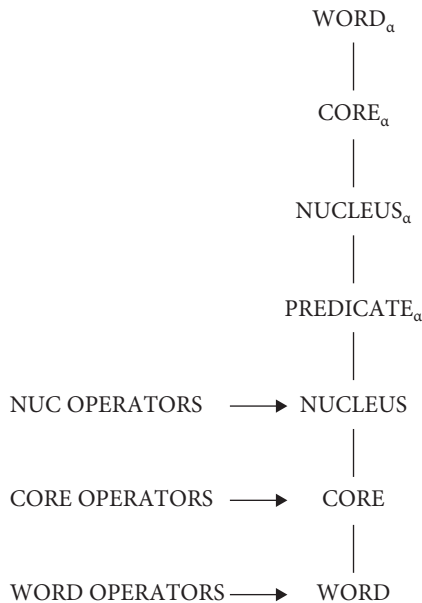
Figure 1. The layered structure of the word.

Lexical constituents take up functional positions in the constituent projection of the Word. Lexical arguments perform semantically-motivated syntactic functions like Argument, Argument-Adjunct and Periphery, as is shown by figures 2 to 5:[13]

---

13. Van Valin (2005: 12) has supressed the node ARG because ARG is a semantic notion like REF (which has also been eliminated under NUC_N) or PRED; and because core dummies do not qualify as arguments, while some extra-core constituents represent syntactic arguments of the predicate. Van Valin (2006) proposes an alternative term (Referring Expression) for the Referential Phrase he puts forward in Van Valin (2005: 28). Since these questions are still

COMPLEX WORD$_N$

CORE$_N$

NUC   ARG$_N$

WORD$_N$

CORE$_N$

NUC$_N$
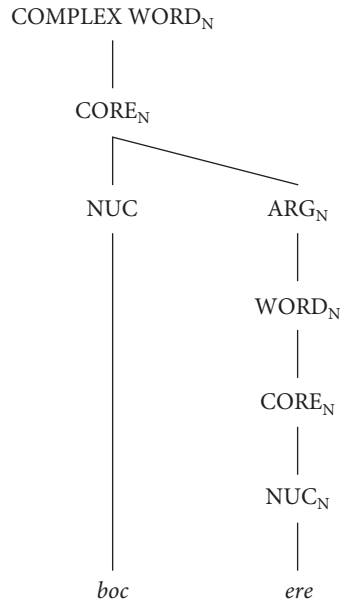
boc   *ere*

Figure 2. First Argument in Complex Word Core: *bocere* "writer".

COMPLEX WORD$_N$

CORE$_N$

ARG   ARG$_N$

WORD   WORD$_N$

CORE   CORE$_N$

NUC   NUC   NUC$_N$
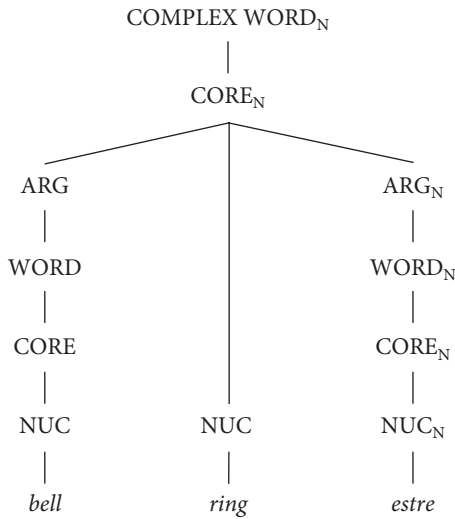
bell   *ring*   *estre*

Figure 3. First and Second Argument in Complex Word Core: *bellringestre* "bell ringer".

open to debate, I espouse the model of the Layered Structure of the Clause as set out in Van Valin & LaPolla (1997).

COMPLEX WORD$_V$

CORE$_V$

AAJ   NUC$_V$

WORD

CORE

NUC
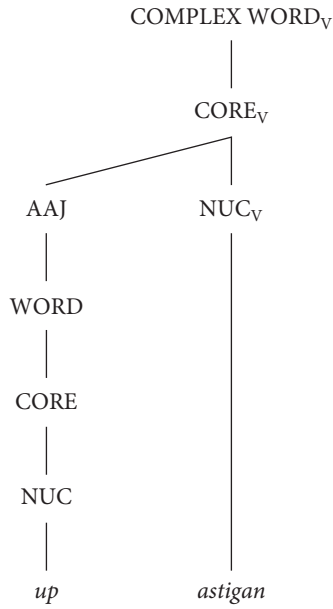
up   *astigan*

Figure 4. Argument-Adjunct in Complex Word Core: *upastigan* "go up".

COMPLEX WORD$_N$

PERIPHERY ⟶ CORE$_N$

ARG$_N$

WORD   WORD$_N$

CORE   CORE$_N$

NUC   NUC   NUC$_N$
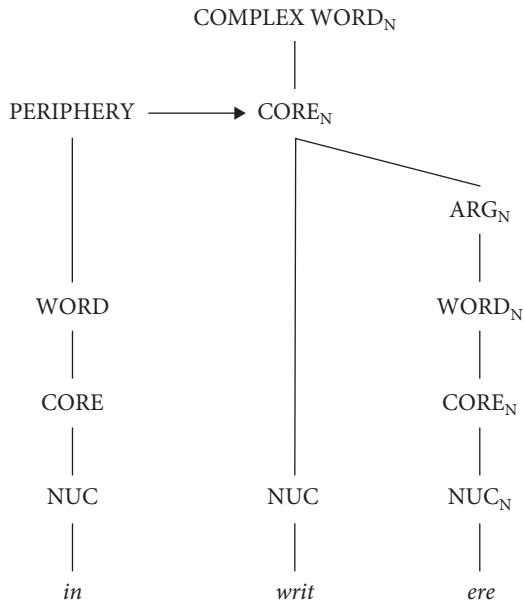
in   *writ*   *ere*

Figure 5. Periphery and Wore of Complex Word: *inwritere* "inner secretary".

Although the insertion of Word arguments is ultimately governed by semantic-syntactic rules, like the insertion of Phrase and Clause arguments, there is a fundamental difference between lexical and semantic arguments. Whereas the linking of semantic arguments in the Phrase and the Clause is direct, the linking of lexical arguments in the Word is indirect, via Phrase linking (Mairal–Cortés 2000–2001: 287–289).

Once the basics of the Layered Structure of the Word have been established, a special provision must be made for the cumulation of two semantic elements that are represented by a single form. Consider the ending -*a* in OE. It can be simply inflective as in figure 6 or inflective and derivative as in figure 7:
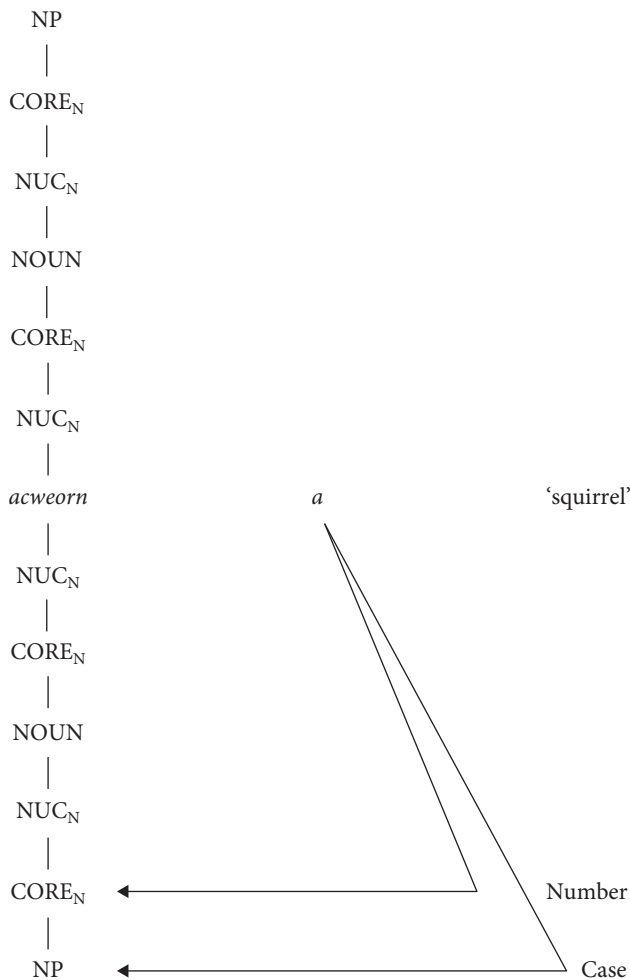
Figure 6. Inflective -*a* in *acweorna* "squirrel".

COMPLEX WORD$_N$

|

CORE$_N$

ARG   NUC   ARG$_N$

| | |

WORD   WORD$_N$

| |

CORE   CORE$_N$

| |

NUC   NUC$_N$

| | |

Here   *tog*   *a*   'army leader'

|

NUC

|

CORE

|

COMPLEX WORD

Number
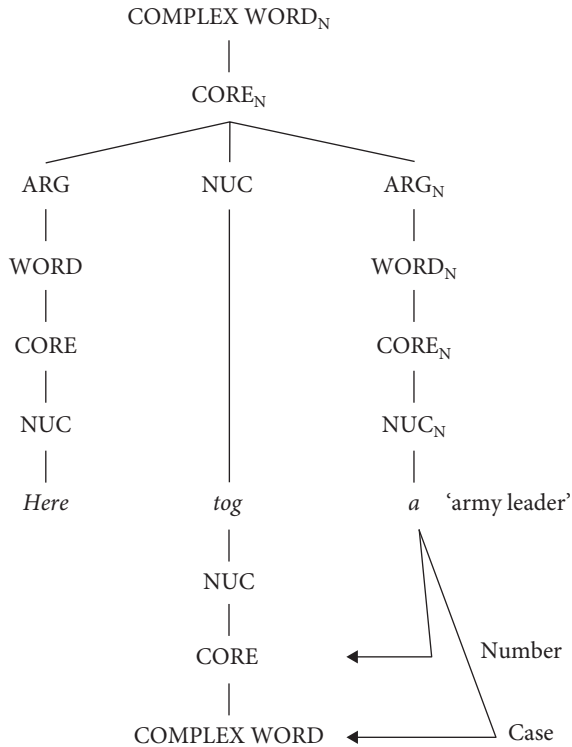
Case

Figure 7. Inflective and derivative -*a* in *heretoga* "army leader".

Notice that in figures 6 and 7 gender is considered a lexical property of the noun that is reflected in case marking.

It is interesting to note that in figure 6 the categorial feature is projected up the projection of the constituents, whereas in figure 7 it is projected up the rightmost element first and then percolates to the CORE node. This gives rise to a basic morphological distinction with with cross-linguistic relevance: certain affixes change the structure of the input category, whereas other do not (Anderson 1985b: 22). Consequently, I distinguish two basic morphological constructions in such a way that tree-diagram representations like those in figures 6 and 7 constitute particular instantiations of these constructions: the endocentric morphological construction and the exocentric morphological construction, illustrated, respectively, by figures 8 and 9.

This distinction is drawn on the basis of the determination of the features relevant for morphology. In an endocentric construction, there is nuclear determination of the features in question. In other words, there is projection of features up the layered structure of constituents, but there is not percolation. For example, *upastigan* "go up" in Figure 4 is an instance of the endocentric construction. In an exocentric construction, there is argument or operator determination of the relevant feature. Put

COMPLEX WORD$_\beta$

CORE$_\beta$

NUC$_\beta$ ARG$_\alpha$

WORD$_\alpha$

CORE$_\alpha$

NUC$_\alpha$

PRED$_\beta$ PRED$_\alpha$
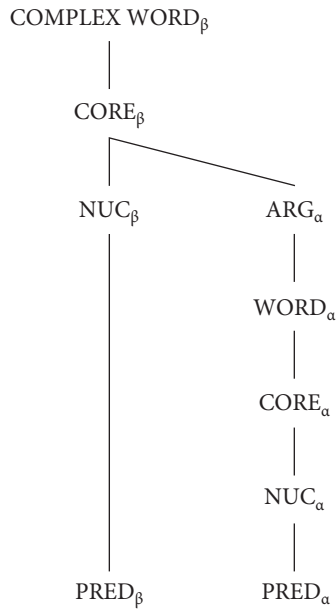
Figure 8. Endocentric morphological construction.

COMPLEX WORD$_\alpha$

CORE$_\alpha$

NUC$_\beta$ ARG$_\alpha$

WORD$_\alpha$

CORE$_\alpha$

NUC$_\alpha$

PRED$_\beta$ PRED$_\alpha$
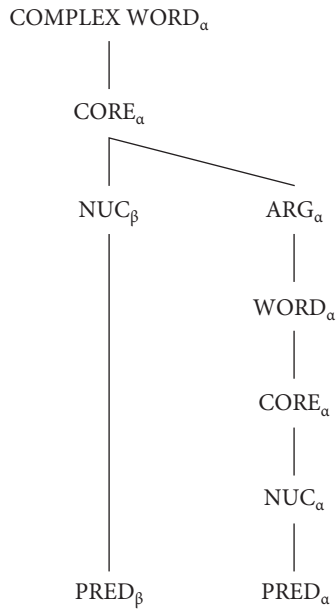
Figure 9. Exocentric morphological construction.

in another way, there is projection of features up the layered structure of constituents and percolation. For example, *bocere* "writer" in Figure 2 is a case of an exocentric construction with argument determination.

Coming back to the functional distinction between constituents and operators, it not only provides an accurate representation of the combination of two semantic elements but also explains what is relationally syntactic (represented in the projection of the operators) and what is non-relationally syntactic and semantically motivated (the constituent projection). In order to furnish additional evidence in favour of the distinction of constituents and operators in the Word, consider instances of polysemy like *forcuman*. The distribution of the accent (*fórcuman* "come before" vs. *forcúman* "destroy") is the phonological correlate of the insertion of a lexical constituent in the compound verb *fórcuman* "come before" and the insertion of a lexical operator in the derived verb *forcúman* "destroy". On strictly morphological grounds, stem-derivations are described as involving a Nucleus, while word-derivations are described as affecting a Core. Figure 10 gives the layered structure of *forcuman* "come before" and figure 11 the one of *forcuman* "destroy":
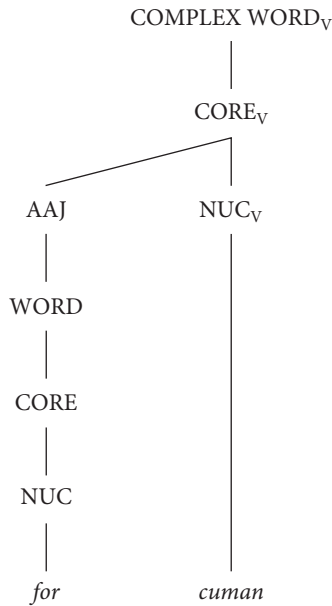
Figure 10. Lexical argument in *forcuman* "come before".

Figure 11 illustrates the notion of Simplex Word: it contains a single Word node with lexical operators (L-ops) attached at the relevant layers; and figure 10 displays a Complex Word, which contains more than one Word node, as a result of the semantically and syntactically-motivated combination of free lexemes or free and

WORD$_V$
|
CORE$_V$
|
NUC$_V$
|

for   *cuman*
| |
Transitivity ⟶ NUC
|
CORE
|
WORD
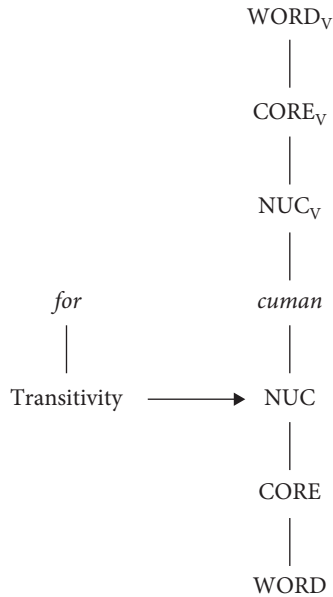
Figure 11. Lexical operator in *forcuman* "destroy".

bound lexemes. The presence of grammatical operators (G-ops) is not relevant for this distinction.

So far, I have put more emphasis on the projection of the arguments than on the projection of operators. It is my contention that the operator projection devised in this proposal unifies relational morphology (inflection) and non-motivated non-relational morphology (derivation not accounted for by the constituent projection). The ultimate reasons for this claim are diachronic and typological: diachronically, free lexemes become bound lexemes and bound lexemes become inflectional through processes of grammaticalisation. The constituent projection can account for continuity free-bound lexemes while the operator projection can explain continuity bound lexemes-bound morphemes. Typologically, the expression of some meanings is derivational in some languages whereas it is inflectional in some other languages, as Bybee (1985) demonstrates. The operator projection explains this continuity. It also stresses the properties of derivative bases: affixes that cannot combine with derived stems represent L-NUCops whereas affixes that can combine with derived stems represent L-COREops. The latter can also combine with underived stems, which is consistent with the Principle of Operator Scope: scope over outer layers implies scope over inner layers. Inflection is a G-WORDop. The Word/Complex Word node is the meeting point of relational and non-relational Word syntax: it delimits the inheritance of relational morphological features and the percolation of non-relational morphological features. This is shown by figure 12.

NP
|
CORE
|
NUC
|
$W_N = NOUN$
|
$CORE_N$
|
NUC_N
|
W   INFL
|
NUC_N
|
$CORE_N$
|
$W_N = NOUN$
|
NUC
|
CORE   ←   Number
|
NP   ←   Gender
|
NP   ←   Case

percolation

inheritance
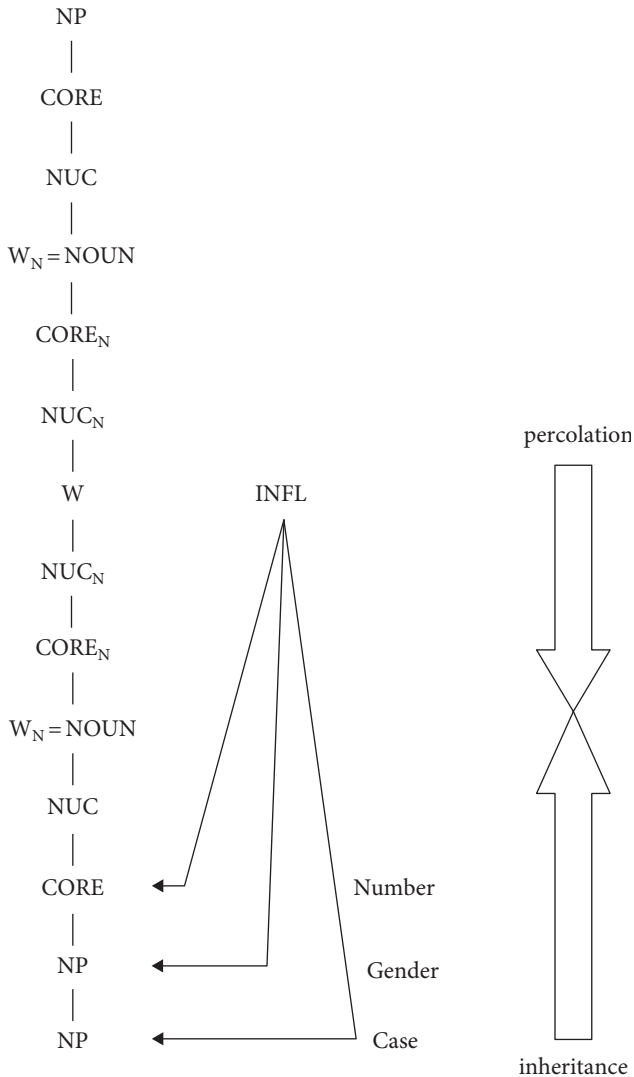
Figure 12. The node W/CW = XCAT.

As for derivation in the operator projection, a functional definition of categories, of the kind offered in section 2, brings about a simplification of derivational morphology in the sense that many affixes are mere recategorisers (and the relevant features of the input and the output category are provided by the definition of the category in the lexicon rather than by the derivational process itself). As an argument in favour of this view, it should be borne in mind that in a number of recategorisations it is difficult to decide if the new category results from derivation and inflection or from inflection

only. As a brief illustration, consider example (9). (9a) and (9b) illustrate inflectional category change: in (9a) two forms are paradigmatically identical and only vary in syntagmatic occurrence, while in (9b) two paradigmatically distinct forms result from the conversion of class. Example (9c) illustrates derivational and inflectional category change: an explicit derivational affix precedes inflection.

(9)   a.   *riht* 'right': *riht* 'what is right'
      b.   *ecged* 'sharp': *ecgan* 'to sharpen'
      c.   *gearo* 'ready' *gearolice* 'readily'

Lexical operators, whether simple recategorisers or conveying a more complex meaning, seem to attach to underived or derived bases in a principled way. Although more research is needed in this area, OE transitivisers are NUCops whereas lexical negation constitutes a COREop. As an illustration, consider:

(10)   a.   Causative (L-NUCop)
            stepan 'step': *onstepan* 'raise'
            fleogan 'flee': *forfleogan* 'put to flight'
            liðan 'be bereft of': *beliðan* 'deprive of'

       b.   Logical Negation (COREop)
            acumendlicnes 'bearableness': *unacumendlicnes* 'unbearableness'
            behelendlice 'secretly': *unbehelendlice* 'without concealment'
            unforsceawodlice 'unexpectedly': *unforsceawodlice* 'unexpectedly'

Operators are functional labels and can be realised by different categories. For example, the realization of the lexical operator of negation in OE involves, at least, the following categories:[14]

(11)   a.   *æ-*   *æblæce*   adjective   'lustreless'
       b.   *mis-*   *misræd*   noun   'misguidance'
       c.   *or-*   *orceape*   adverb   'without cause'
       d.   *un-*   *unaga*   noun   'one who owns nothing'
       e.   *wan-*   *wanhal*   adjective   'ill'
       f.   *-leas*   *gastleas*   adjective   'dead'

Summarising, the Layered Structure of the Word represents elements can be linked to syntax in the constituent projection as lexical arguments; and elements that cannot be linked to syntax in the operator projection as lexical operators. Inflection at Word or Complex Word level is tantamount to inflection at the Nucleus level of the Phrase. Consequently, the node Word or Complex Word represents the limit of percolation of morphological features as well as the limit of inheritance of inflectional features from the NP. Given the Layered Structure of the Word and the basics of inflection, derivation and compounding, it is necessary to determine what kinds of units

---

14.   But see Cortés (forthcoming).

take up the semantic-syntactic domains of the Word. In OE, these domains are realised by categories that include bound forms (affixes and stems) and free forms (lexemes), as is illustrated by (12):

(12)   a.   affixes: *a-* (*ablysung* 'shame', *abolgenes* 'irritation'), *be-*, *-estre*, *-scipe*, etc.
       b.   stems: *-cum-* (*tocuman* 'arrive', *cuma* 'stranger', *cumliðnes* 'hospitality'), *-far-*, *-sac-*, *-secg-*, etc.
       c.   lexemes: *drifan* (*adrifan* 'drive', *onwegadrifan* 'drive away'), *nied*, *ende*, etc.

Given the levels of juncture I have sketched, the types of morphological nexus identifiable in OE derivational morphology include: the coordination of two free forms in figure 13; the subordination of a free form to another free form in figure 14; the subordination of a bound form to a free form in figure 15; and the cosubordination of two dependent forms in figure 16. In other words, coordination implies the structural independence of two free forms, subordination involves one bound form that is structurally dependent on a free form and cosubordination requires structural interdependence of two bound forms:

COMPLEX WORD$_{ADV}$

WORD$_{ADV}$ WORD$_{ADV}$

CORE$_{ADV}$ CORE$_{ADV}$

NUC$_{ADV}$ NUC$_{ADV}$
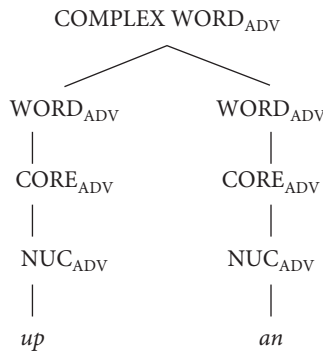
up   *an*

Figure 13.   Coordination in the Complex Word: *upan* "upon".

Although more research is needed both in the area of lexical operators and in that of juncture levels, this proposal at least constitutes an attempt to contribute to the generalisation of the descriptive and explanatory principles of complex syntactic structures to complex morphological structures. The last part of this section engages more directly with the interplay between syntax and morphology through a morphological template for OE.

The concept of templates with functional positions was proposed by Dik (1997a) and further developed by Bakker (2001) in his dynamic model of expression rules. I have put forward elsewhere (Martín Arista 2006a) that templates in a functional theory of morphology represent lexical structures that are related to morphological constructions by means of trees. In order to devise a morphological template, it is necessary to decide what categories realise the semantic domains of the Word and the way in which they combine with one another. Bound forms do not combine with bound forms. The

COMPLEX WORD$_V$

CORE$_V$

AAJ$_{ADV}$ NUC$_V$

WORD$_{ADV}$

CORE$_{ADV}$

NUC$_{ADV}$
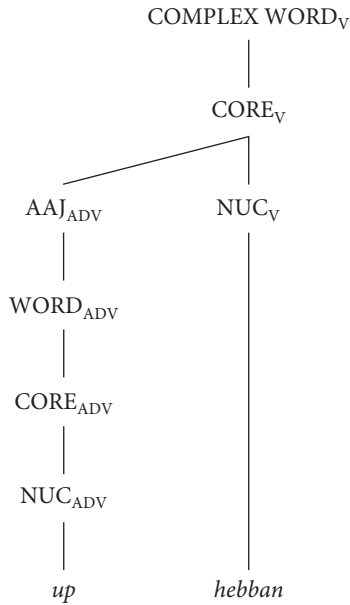
up   *hebban*

Figure 14. Subordination in the Complex Word (Prefield): *uphebban* "raise up".

COMPLEX WORD$_N$

CORE$_N$

NUC   ARG$_N$

WORD$_N$

CORE$_N$

NUC$_N$
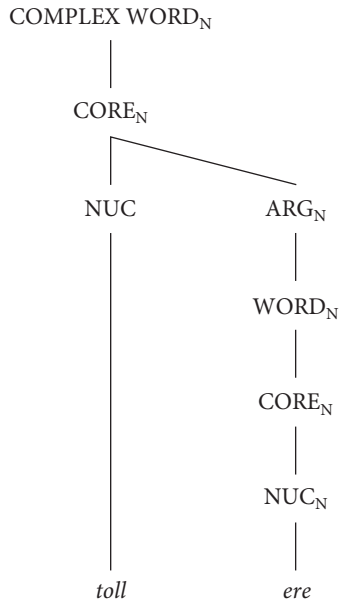
toll   *ere*

Figure 15. Subordination in the Complex Word (Postfield): *tollere* "tax gatherer".

WORD$_N$

|

CORE$_N$

|

NUC$_N$

NUC   NUC$_N$

| |

twi   *wæ*
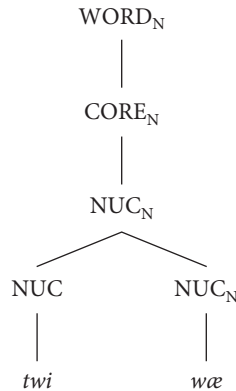
Figure 16. Cosubordination in the Complex Word: *twiwæ* "twice".

combinations affix plus affix and stem plus stem do not occur in OE. This leaves us with three possible combinations of classes in OE derivation:

(13)   a.   stem plus affix: *a-drincan* 'be drowned'
       b.   lexeme plus affix: *of-adrincan* 'drain'
       c.   lexeme plus lexeme: *win-drinc* 'wine'

Once the classes and combinations in derivation have been established, there is a piece of evidence which is of the utmost relevance for proposing a language-specific morphological template for OE: the maximum degree of complexity that OE words admit. Consider the following examples:

(14)   a.   *un-ge-**sib**-sum-nes* 'discord'
       b.   *un-ge-**scead**-wis-lic* 'irrational'
       c.   *un-be-**helend**-lic-e* 'without concealment'

The maximum degree of complexity in OE words is illustrated by instances like (14). No cases of triple prefixation or suffixation have been found. On account of the evidence produced so far, the template for the OE Word I propose is as follows in (15):

(15)   [Prefield 2] [Prefield 1] Nucleus [Postfield 1] [Postfield 2]

As an illustration, both Prefield slots are filled in (16a); both Postfield slots are filled in (16b), while both slots are filled in the Prefield and the Postfield in (16c):

(16)   a.   ***ær-ge**-fremed* 'before commited'
       b.   *higend-**lic-e*** 'quickly'
       c.   *un-ful-frem-**ed-nes*** 'imperfection'

The insertion of elements into the slots of the template is governed by general principles, syntactic rules and morphological rules. General principles (GP) stipulate that:

GP1.   The lexical elements that take up template slots are listed in the lexicon with their selection restrictions and linearization restrictions (Prefield or Postfield).

GP2.   Template slots are defined centripetally, that is, core meanings occupy central positions whereas peripheral meanings take up less central positions.

GP3.   Arguments and Non-Arguments compete for taking up Prefield and Postfield slots.

GP4.   The insertion of lexical and grammatical elements is governed by syntactic and morphological rules.

GP5.   The motivation of syntactic rules is semantic; the motivation of morphological rules is to be sought in language processing.

Syntactic rules (SR) are semantically motivated, that is, they relate template slots to Word functions:

SR1.   There is one argument slot in the Prefield and another one in the Postfield. If only one slot is filled, it must be POST1:

(17)   a.   *mierr-**a*** 'deceiver'
       b.   *andett-**ere*** 'one who confesses'
       c.   *lær-**estre*** 'instructress'

SR2.   There is one argumental slot in the Prefield and another one in the Postfield. If both slots are filled, these are PRE1 and POST1:

(18)   a.   ***leoht**-bor-**a*** 'light-bearer'
       b.   ***hrægl**-ðen-**estre*** 'robe keeper'
       c.   ***wull**-tew-**estre*** 'wool-carder'

SR3.   Argument-Adjuncts must be inserted into the Word Prefield, in PRE2:

(19)   a.   ***in**-genga* 'visitor'
       b.   ***ofer**-genga* 'traveller'
       c.   ***æfter**-folgere* 'follower'

SR4.   Peripheries must be inserted into the Word Prefield, in PRE2:

(20)   a.   ***in**-writere* 'resident writer'
       b.   ***mete**-rædere* 'reader at meal-times'
       c.   ***rap**-genga* 'rope-dancer'

Morphological rules (MR) make reference to the morphological nature of lexical elements, whether they are free or bound and whether they are basic or derived:

MR1.   If both the Prefield and the Postfield argument slots are filled, the free element is inserted into PRE1 and the bound element into POST1:

(21)   a.   ***boc**-ræd-**ere*** 'reader of books'
       b.   ***eald**-writ-**ere*** 'writer on ancient history'
       c.   ***horn**-blaw-**ere*** 'horn-blower'

MR2.   If free and bound elements are inserted into the Prefield, more separable elements are inserted into PRE2, less separable elements are inserted into PRE1:

(22)   a.   ***in-a**-beran* 'bring in'
      b.   ***for∂-be**-seon* 'look forth'
      c.   ***in-for**-lætan* 'let in'

MR3.   If two free elements are inserted into the Prefield, all of them take up a maximum of one Prefield slot, as in (23a). The choice of PRE2 or PRE1 is determined on the grounds of Word function: arguments in PRE1 and non-arguments in PRE2. This is motivated semantically: two free elements perform a single function, which is not the case with two bound elements. If one free and one bound element are inserted into the Prefield, they take up two slots, as in (23b):

(23)   a.   ***[unriht-hæmed]**-fremm-ere* 'adulterer'
      b.   ***un-∂urh**-sceot-en-lic* 'impenetrable'

MR4.   If both morphological slots in the prefield are filled, PRE1 must be taken up by a bound element of the diachronically-consistent series *a-*, *be-*, *ge-*, and *for-*:

(24)   a.   *up-**a**-brecan* 'break out'
      b.   *ofer-**be**-beodan* 'rule'
      c.   *in-**for**-lætan* 'let in'

The template I have devised for OE derivational morphology is compatible with syntactic templates (Van Valin & LaPolla 1997), which take issue with inflectional rather than derivational morphology. It can account in a unified way for the morphological processes of compounding, affixation, zero derivation and extension, as well as for the input and the output of such processes. It combines the stepwise processing of complex words (Marslen-Wilson et al. 1994; Wurm 1997) with a monostratal description of linguistic structures (Dik 1997a,b; Van Valin 2005). It is arranged centripetally, which is consistent with the general principles of semantic organization that attribute the core meaning to the more central positions and the peripheral meaning to the less central position (Hay 2002, 2003). It makes reference to the basic or derived character of the bases of derivation (Giegerich 1999). And, finally, the template imposes a processing restriction on the complexity of derived lexemes (Hay & Plag 2004).

5.   Conclusion: Summary and lines of research

On the theoretical side, we may conclude that although morphology is largely driven by principles that also rule syntax and semantics, other principles such as feature percolation and the characteristics of bases and adjuncts remain specifically morphological. As a second theoretical conclusion from the previous discussion, we see that unification and separation in morphology must be carried out on functional grounds.

This means, to begin with, that structuralist terms like *compounding* and *derivation* are not explanatory (if not actually misleading) and therefore avoided here. On the descriptive side, we may say that OE derivation does not conform to lexical integrity, understood either as relative ordering of morphological processes or as visibility into morphology.

This discussion opens numerous lines of reseach, of which I should like to highlight two: lexical operators and the relationship between morphological constructions and templates. I have drawn a distinction between lexical operators and grammatical operators. There remains much to do before the full set of restrictions on lexical operators is known, but partial works such as Lieber (2004) and Cortés (forthcoming) rightly demonstrate that the aim is attainable. It involves, first, the full inventory of lexical functions, in the line of Mel´čuk (1996) or Beard & Volpe (2005); second their relationship with phrase operators as presented in Van Valin & LaPolla (1997) and Rijkhoff (2002); and third, their realization. Regarding the relationship between morphological constructions and templates, the layered structure (rather than the templates) of the Word provides the fully-fledged functional description. Constructions represent an attempt to reinforce the interlinguistic dimension of the proposal, because cross-linguistically the change of category status by morphological processes is well-attested. Moreover, constructions may prove useful in investigating the impact on morphology of general properties of language and cognition such as asymmetry (as in Martín Arista 2006b) and recursivity.

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Modality in RRG

Towards a characterisation using Irish data

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In this paper we are concerned with providing elements of a characterisation of modality in RRG using data from Irish, a VSO language found on the west of Europe. We outline the characteristics of modality drawing on previous work on modality and modal logic, and relate this to patterns in sentence syntax and the semantics of the event frame. Issues of scope and negation are examined and presented. We extend the logical structure notation used in RRG (Van Valin 2005) to include additional logical notation to represent the modality expressions. Deontic modality is concerned with obligation and permission whereas epistemic modality is concerned with knowledge and belief. Modality is also concerned with coding of necessity versus possibility and, in some accounts, with the idea of "possible worlds" (Portner 2005). We motivate a relationship formally between deontic, dynamic and epistemic modality in terms of RRG. A characterisation of modality in Irish is also provided.

1.   Introduction

In this paper we give a brief overview of the present treatment of modality in RRG within the operator projection. From this, we identify a set of modal operators. We then examine elements of modal logic from formal semantic theory and couple this with a set of modal operators to motivate our application of an enhanced model of modality within RRG. We examine the syntactic patterns of modal expression in Irish, a VSO language found on the west of Europe. We apply the extended model of modality to this data and characterise Irish modal expression accordingly.

2.   Modality distinctions within the literature

Modality has been widely studied but general agreement has still not been achieved as to a common unified understanding of modal phenomena and its correlates in language. One of the reasons for this is that "*operators like tense, aspect, modality and illocutionary force are very complex semantically*" (Van Valin 2005: 50). These operators may be realized as individual words, including auxiliaries, and/or as a bound morpheme (Van Valin & LaPolla 1997: 40–45), depending on the type of language.

2.1   Modality in RRG

In RRG, particular operators are held to modify different levels within the layered structure of the clause (LSC), for which see figure 1. Also, a category called "STATUS" clusters together the set of operators for epistemic modality, the real/irrealis distinction and external negation. Deontic modality is concerned with obligation and permission whereas epistemic modality is concerned with knowledge and belief. Modality is also concerned with coding of necessity versus possibility and, in some accounts, with the idea of "possible worlds" (Portner 2005).

2.2   The deontic, dynamic and epistemic modal distinctions

For de Hann (2005), the term deontic modality deals with the degree of force exerted on the subject of the sentence to perform the action identified by the matrix verb while

SENTENCE

CLAUSE

CORE

NUC

PRED

V

NUC — Aspect / Negation / Directionals (predicate)

CORE — Directionals (participant) / Event quantification / Root modality / Negation (internal/narrow-scope)

CLAUSE — Status / Tense / Evidentials / Illocutionary force — Epistemic modality / External (propositional) negation / Realis/irrealis

SENTENCE
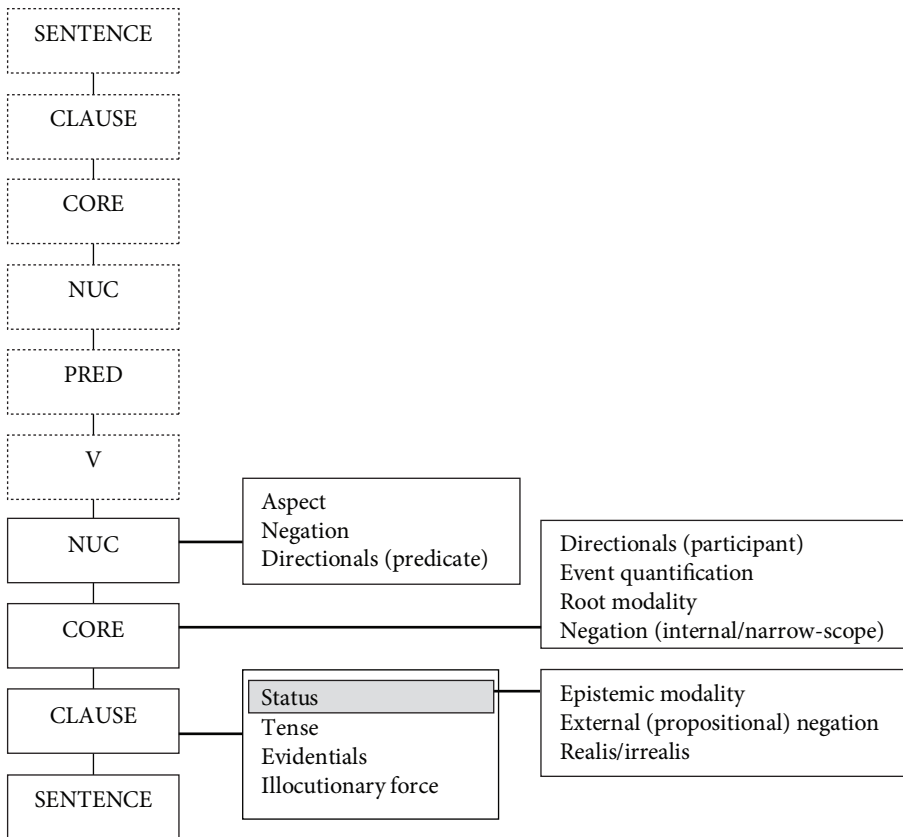
Figure 1. The RRG operator projection within the different levels of the layered structure of the clause (adapted from Van Valin 2005: 12).

epistemic modality refers to the degree of certainty that a speaker has that what they are saying is true. It is generally accepted that this division of modalities into epistemic and deontic actually requires a further division, often referred to as dynamic modality, to encode ability and often volition. In addition, scholars, for example Sweetser (1990), have proposed various terminologies for deontic modality, i.e., root modality as a cover term for both deontic and dynamic modality. For Coates, the relationship between modalities looks broadly like that shown in figure 2:
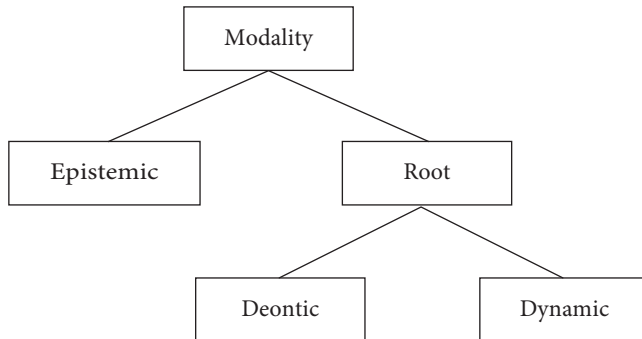
Figure 2. Relationship between modalities based on Coates (1983).

For Coates (1983: 20/21), modal meanings are gradual and do not have arbitrary cut-off points. Her view is that modals have core and peripheral meanings. Deontic and dynamic refer to core meanings and therefore the term root encompasses both of these.

It is worth noting that, in the general linguistic literature, scholars such as Bybee (1985: 166ff) and Bybee, Perkins & Pagliuca (1994), and Sweetser (1990 & 1996); Jackendoff (2002); Talmy (1981, 1988); Palmer (2001), amongst others, propose some different divisions of modality as, for example, agent-oriented modality, speaker-oriented modality, subordinating, counter-factual, modality as sets of rights and obligations, and force dynamics-based modality. These divisions are outside the scope of this paper.

In the next section we look at modal logic in formal semantic theory and highlight some key ideas that we will employ later into the RRG analysis. We will exercise several of these with our Irish data to demonstrate the validity of the approach.

3. Modal logic

The treatment of modality in modal logic within formal semantic theory is more constrained than the analysis of modality in natural languages (Allwood et al. 1997; Portner 2005). Modal logic introduces a number of modal operators:

(1)   □ operator which is held to indicate that a statement is <u>necessarily</u> true

(2)   ◊ operator which is held to indicate that a statement is <u>possibly</u> true

This allows one to formally make the distinction between, for example, (3) and (4):

(3)   a.   John is at home
      b. $[\mathbf{be_{LOC}}\text{-}\mathbf{at'}(\text{home, John})]$
           <u>With the meaning interpretation</u>: John is at home

(4)   a.   John must be at home
      b.   □ $[\mathbf{be_{LOC}}\text{-}\mathbf{at'}(\text{home, John})]$
           <u>With the modal meaning interpretation</u>: John is *necessarily* at home

We can now logically represent different and additional information. These modal logic operators allow us to make "statements about statements" represented in propositional logic and have the following general semantics (5–8). The treatment of modality in modal logic within formal semantic theory allows that certain situations may be true given certain conditions holding, that is, in some possible world. In the semantics of possible worlds, the logical *true* is different in different worlds and the worlds are mutually accessible via an accessibility relation, such that φ is some proposition and $\mathbf{w_{index}}$ is a world accessible from $\mathbf{w}$.

(5)   □ **operator** : → necessarily true, obligatory

(6)   ◊ **operator** : → possibility, possibly true, permissible

(7)   □ (φ) is true in $\mathbf{w}$ if φ is true in <u>all</u> $\mathbf{w_i}$ <u>accessible</u> from $\mathbf{w}$

(8)   ◊ (φ) is true in $\mathbf{w}$ if φ is true in <u>at least one</u> $\mathbf{w_i}$ <u>accessible</u> from $\mathbf{w}$

The challenge is to extend the RRG logical structure to include the modal operators identified earlier. We do this according to the following schema (9). This treats a modal operator Φ as having an arity of two, that is, an operator with two operands. The first argument of the operator represents the speaker or actor while the second represents the proposition and its associated situation type, that is, its RRG logical structure. This representation allows us, for example, to code a speaker within the modal utterance (10). Therefore, we can now reflect an epistemic belief state over a situation type participant as (11).

(9)   The representation of the modal operators Φ in LS
      $\Phi\ (\ z_{i/j},\ [\mathbf{do'}(x\ [\mathbf{pred'}(x_j,\ y)\ ])])$
      Where Φ represents a modal operator:
      possibility ◊ or necessity □

(10) $(\Phi\ \text{Speaker}\ (x_{j/k})\ [\text{LS}(y_k,\ \varphi)])$

(11) $(\Phi_{\text{espistemic}}\ (x_{j/k})\ [\text{LS}(y_k,\ \varphi)])$

In the logic, representing necessity and possibility, we can also demonstrate the placement and relationship between internal and external negation in the polarity domain.

(12)   **possibility ◊ necessity □** where *p* is some proposition
       a.   ◊ *p* ◊   ≡   ¬ □ *p*
       b.   ¬ ◊ *p*   ≡   □ ¬ *p*

    c. $\neg \Diamond \neg p$ $\equiv$ $\Box\, p$

    d. $\Diamond \neg p$ $\equiv$ $\neg \Box \neg p$

This seems to map well to the scopal ordering of polarity with external negation at the clause level and internal narrow-scope negation at the core, shown in figure 1, for the RRG operator projection. To relate the logic of modality and polarity to RRG we use the formal representation of logical structure, rather than the modal logics of formal semantic theory. External and internal negation are then coded in the logical structure (13) according to their scope, as we indicated in the logics indicated in (12).

(13)   ($\text{NEG}_{\text{external}}\ \Phi\ (x_{j/k})\ \text{NEG}_{\text{internal-narrow}}\ [\text{LS}(y_k, \varphi)])$

This model, which relates the two-place modal operators found in modal logics to the RRG logical structure, allows us to link to the theoretical machinery associated with the RRG Actor-Undergoer Hierarchy, for the determination of states of affairs and aktionsarten. In this model, then, Φ is a placeholder for one of the two-place modal operators. The operators are the ones we discussed earlier. We now look at modal expression in Irish, and relate the modal operator types into the RRG logical structure for the Irish data.

4.   Modal expression in Irish

Modality in Irish may be carried a number of particular syntactic templates involving particular verbs and the root (deontic/dynamic) vs. epistemic distinction occurs within these under certain conditions mainly to do with the type of complement clause. The syntactic pattern of the Irish modal types is shown following in (14).

(14)   <u>The Syntactic Pattern of the Irish Modal Types</u>

        Type   1a: Root: V always followed by a VN complement.

                1b: Root: Copula + VN clause:

                      Ba_{cop} + ADJ|N + VN clause

                1c: Root: Negative Copula + VN clause:

                      Ní féidir + ADJ|N + VN clause.

                1d: Root: Substantive Verb of 'to be' + ADV|ADJ|PREP + VN clause:

                      Tá mé in ann …

        Type   2a: Epistemic: V followed by a finite complement

                      (occasionally a VN under certain circumstances).

                2b: Epistemic: Copula + finite clause:

                      Ba_{cop} + *féidir* + finite complement

                2c: Epistemic: Negative Copula + finite complement clause:

                      Ní féidir + finite complement

For type 1a and 2a, V is a verb from the class of verbs of necessity, possibility and ability and has the status of a main verb. Root is used here within this discussion as a

descriptive cover-term for both deontic and dynamic modalities. The copula shows inherent focus and differentiates new from old information while the substantive verb of "to be" codes for a state that has recently come about.

The copula types 1b,c and 2b,c and substantive verb type 1d, of the types indicated in (14), are variations on their respective root or epistemic schemata in virtue of their focus or state change semantics. Syntactically, while the substantive verb takes all tenses, the copula is impoverished in inflection and is never inflected for person. Some description of the morphological forms of the copula is useful here for our discussion. The copula has only two forms for tense: *is* "be" is the unmarked form used for present and future while *ba* "be" is used for past and conditional meanings.

In complement clauses, the copula takes the form *gur* in the present, *gurb* before vowels and *gurbh* is the past tense. In direct relative clauses, the copula remains as *is* "be" in the present, as *ba* "be" in the past but may be optionally be preceded by *a* "that", the relative particle. The copula has negative forms: *ní* "NOT be" in the present, *níorbh* in the past. Embedded negative copulas and negative copula questions take the respective present and past forms: *nach*, *nár*(*bh*). The copula is held to predicate for essential or inherent qualities and generally takes NP predicates whereas the substantive verb predicates for qualities of a more temporary or transitory nature. The substantive verb also predicates for existence, state, location and possession, and its predicates include adjectives, adverbs and prepositional phrases. The predicate of the copula carries new information or focus, and the opposition between new (copula predicate) and old (copula subject) information is inherently a part of the semantics of the copula: $[COP_{PRED}[NP_{FOCUS}]\ [NP_{relative\_clause}]_{subject}]$. While the root-epistemic distinction is not marked on the main verb, syntactically, the distinction occurs in virtue of the type of complement (VN for root and finite clause for epistemic) across the types indicated above.

We can note also that many adverbs and adjectives play a role as signal carriers of modality and they constitute a closed class. In Irish, while both adjectives and adverbs are used to carry modal expression, adjectives appear to be used mostly and we can observe this from the type 1 constructions schematised in (14).

4.1   The root modals

In this section we examine the differing root modal types found in Irish data.

4.1.1   *The schema for root modals*

We will see that in the case of the root (deontic and dynamic) modality we have, in RRG terminology, a control construction where the NP_1 is the controller of the construction with respect to the embedded (VN) verb complement. The root modals (both deontic and dynamic) are always followed by a VN complement. Schematically, we can represent the syntactic pattern for the type 1a constructions root modals as (15):

(15)   **Root**:   Modal-verb NP_1 (NP_2)   VN

Also, we will find that future and conditional tenses are used to code modality. The use of the VN embedded in the clause to the right of the matrix verb in the type 1 constructions is indicative of progressive aspect which implies the continuity of the denoted event before and after the time of reference of the utterance, that is, speech act time. There is, therefore, a sense that the root modals are imperfective and irrealis (to occur, if at all, in some future time), and the epistemic modals are perfective, realis and to have occurred, in some time before the speech act time (in some possible world, if not this one). The schema (15), for type 1 root constructions found in (14) and (16) constitutes a control construction where the NP_1 is the controller of the construction with respect to the embedded (VN) verb complement. An optional NP_2 may be found, depending on the transitivity/argument structure of the embedded verb.

The first modals we examine are the deontic modals for types 1a, b, c, and d. For type 1 modals we separately treat the deontic and dynamic modals as subtypes of the type 1 root.

4.1.2   *Deontic modals*
The first example uses the verb "*caith*" and is a fully inflectable verb with a multitude of senses, including a modal sense and we see here that it follows the type 1a pattern of V always followed by a VN matrix complement.

(16)   The Syntactic Pattern of the Irish Root Modal Types

   Type   1a: Root: V always followed by a VN complement.

   1b: Root: Copula + VN clause:
   $$Ba_{cop} + ADJ|N + VN \text{ clause}$$

   1c: Root: Negative Copula + VN clause:
   Ní féidir + ADJ|N + VN clause.

   1d: Root: Substantive Verb of 'to be' + ADV|ADJ|PREP + VN clause:
   Tá mé in ann …

(17)   *Caithfidh   muid   eolas   a   lorg*
   Must:v-fut   we:pn   knowledge:n   that:prt   find:vn

   ina   taobh.
   in:PP+his:poss pn   side:adv

   We must find information about him.

The verb *caith* is highly polysemic and includes "throw", "spend", "wear", "consume", "expend", and "cast" among its meaning senses. It also used, with future and conditional tenses, similar in some respects to an auxiliary verb in other languages, to denote modality. It is this modal sense, which is very productive, that we are interested in here. It is worth noting however that, as a full lexical verb that may be either transitive or intransitive, *caith* has a lexical entry (18a). The embedded VN, in (17), also has a lexical entry and an argument structure (18b).

(18)   a.   *caith*:   **do′**(x, [**must′**(x (, y))])   'must', 'put' and other senses
       b.   *lorg*:   **do′**(x, [**find′**(x , y)])   'find'

When we represent the example in (17) in a logical structure we need to combine the two entries of (18) in a meaningful way to denote the sense required. In particular, we need to appropriately get identity by coindexing across the participants. A tentative logical structure for this is given in (19a). However, we are interested in the modal sense of *caith* from among its many meaning senses so we can substitute this into the logical structure representation according to the schema exemplified in (10). Here, the modal sense is "must", and we represent this as (19b), denoting deontic force. The actual detail of (17), therefore, is given in (19c and 19d), but simplified somewhat for purposes of explanation.

(19)   a.   <u>**do′**(x$_1$, [**must′**(x$_1$, [**do′**(x$_1$, [**find′**(x$_1$, y$_2$)])])])</u>
       b.   **must′**$_{Root}$(x$_1$, [**do′**(x$_1$, [**find′**(x$_1$, y$_2$)])])
       c.   **must′**$_{Root}$(we$_1$, [**do′**(we$_1$, [**find.about.him′**(we$_1$, knowledge$_2$)])])
       d.   □ [**do′**(we$_1$, [**find.about.him′**(we$_1$, knowledge$_2$)])]

In (20) we see an example of type 1b, involving the copula. This is an example of deontic ability with a sense of modal force. Broadly, the copula provides for four specific functions or purposes, that of classification, identification, expression of ownership with the preposition *le* "with", or to indicate an emphasis. It also inherently provides for focus constructions and in this usage we get modal expression. This example, again, has an embedded VN as a matrix verb. We apply the same rationale as previously to this example for the logical structure.

(20)   *Ba*   *cheart*   *dó*   *é*   *a*   <u>*rá*</u>   *leo.*
        Is:COP   right:ADJ   him:PN   it:PN   that:PRT   say:VN   to:PP+them:PN
        He should say it to them.
       a.   **should′**$_{Root}$(he$_1$, [**do′**(he$_1$, [**say.to.them′**(he$_1$, them$_2$)])])
       b.   □ [**do′**(he$_1$, [**say.to.them′**(he$_1$, them$_2$)])]

We now apply the analysis to the dynamic modal types.

4.1.3   *Dynamic modals*

We have already mentioned the polysemic nature of the verb *caith*. In example (21) we see it employed to code for dynamic obligation. The syntactic pattern is that identified in <u>type 1a</u>, consisting of a V always followed by a VN complement.

(21)   *Caithfidh*   *Máirtín*   *an*   *doras*   *a*   <u>*phéinteáil.*</u>
        Must:V-FUT   Martin:N   the:DET   door:N   that:PRT   paint:VN
        Martin must paint the door.
       a.   **must′**(Martin$_1$, [**do′**(Martin$_1$, [**paint′**(Martin$_1$, door)])])
       b.   □ [**do′**(Martin$_1$, [**paint′**(Martin$_1$, door)])]

Dynamic ability is also coded in (22) using, this time, the construction <u>type 1c</u> with the copula followed by a VN complement. The polarity is negative with scope over the modality.

(22)   *Ní   féidir   le   Bríd   Fraincis   a   <u>fhoghlaim</u>.*
       Neg+is:COP able:ADJ   with:PP   Bríd:N   French:N   that:PRT learn:VN
       Bríd can't learn French.

   a.   **NOT**(**abl′**(Bríd$_1$, [**do′**(Bríd$_1$, [**learn′**(Bríd$_1$, French)])]))
   b.   ¬ □ [**do′**(Bríd$_1$, [**learn′**(Bríd$_1$, French)])]

In example (23), we see a <u>type 1d</u> construction with the syntactic pattern of the substantive verb of "to be" followed by a VN complement, coding for, in this particular case, dynamic ability. The substantive verb is the second verb of "to be" in Irish (the first being the copula). It has an irregular morphological form (for example, *tá: V-PRES* and *bhí: V-PAST* with other forms across the tenses) and is used to express existence, position, state or condition that has in some sense recently come about and that is not intrinsic but temporary or transitional. The order of elements in the substantive construction is [verb, NP$_{subject}$] followed by additional elements such as adjectives, adverbs, prepositional phrases and verbal nouns. This example denotes, within a <u>type 1d</u> substantive verb construction, a state of affairs that has recently come about and represents a modal sense of dynamic ability.

(23)   *Tá   mé   in   ann   damhsa   a   <u>dhéanamh.</u>*
       Be:SUBV   me:PN   in:PP   there:ADV dance:N   that:PRT do.make:VN
       I can (now) dance.

   a.   **abl′**(me$_1$, [**do′**(me$_1$, [**dance′**(me$_1$)])])
   b.   □ [**do′**(me$_1$, [**dance′**(me$_1$)])]

We might also notice generally that it appears from the data that the substantive verb (SUBV) of "to be", as well as the copula, occurs with deontic and dynamic modals. No examples of the substantive verb (SUBV) of "to be" were found with epistemic constructions, whereas the copula verb is found. We will look at epistemic constructions in the next section.

4.2   Epistemic modals

In this section we examine the epistemic modals. First we describe the schema for the different syntactic patterns of the epistemic modal types.

4.2.1   *The schema for epistemic modals*

For epistemic modals we will see that, in the case of type 2 epistemic modal constructions (24) that a different schema is warranted than that employed with the root modals. The epistemic modal constructions always have a (modal) V followed by a finite complement.

(24)   The Syntactic Pattern of the Irish Epistemic Modal Types

   Type   2a: Epistemic: V followed by a finite complement
                           (occasionally a VN under certain circumstances).
          2b: Epistemic: Copula + finite clause:
                           Ba_{cop} + *féidir* + finite complement
          2c: Epistemic: Negative Copula + finite complement clause:
                           Ní féidir + finite complement

Schematically, we can represent this, for type 2a constructions (epistemic), as:

(25)   Epistemic: Modal-verb NP_1 V_{fin} NP_2 (NP_3)

We now apply the analysis to the epistemic modal types.

4.2.2   *The data and analysis of the epistemic modals*

In this section we examine the epistemic modals. Epistemic modals are always followed by a finite complement and the syntactic patterns of type 2a,b, and c apply. Constructions using the substantive verb do not seem to apply here – however, this would need to be confirmed by further research.

   We can notice that, again, the same verbs can be found in epistemic modal constructions as with root modal constructions. The modality type is distinguished by the nature of the embedded verbal complement. In epistemic modality the control structure construction does not apply. The schema identified in (25) holds, with appropriate variations on this for copular constructions while retaining the finite complement requirement. In the following type 2a example we find an instance of epistemic belief. As we found with deontic and dynamic modals using the verb *caith*, the logical structure has a main verb and an embedded verb in a complement clause. In this instance, the embedded verb is not a verbal noun but a finite verb clause.

(26)   a.   *Caithfidh   gur   phós   Mairead   Brian*
            Must:V-FUT   that:PRT   marry:V-PAST   Margaret:N   Brian:N
            Margaret must have married Brian.

       b. $\mathbf{must'}_{epistemic}(z_3, [\mathbf{do'}(Mairead_1, [\mathbf{marry'}(Mairead_1, Brian_2)])])$

       c. $\lozenge\ (z_3, [\mathbf{do'}(Mairead_1, [\mathbf{marry'}(Mairead_1, Brian_2)])])$
            Where:
                The **z** argument represents the speaker with the belief state at utterance
                time **Ts**.

       d. $\lozenge\ [\mathbf{do'}(Mairead_1, [\mathbf{marry'}(Mairead_1, Brian_2)])]$

Similarly, in example (27) we find, in the type 2a pattern, an instance of epistemic inferred certainty.

(27)   *Caithfidh   sé   go   bhfuair   tú   coláiste.*
       Must:V-FUT   it/he:PN   that:PRT   get:V-PAST   you:PN   college:N
       It must be the case that you received a college education.

       a. $\lozenge\ \mathbf{infc'}_{epistemic}(z, [\mathbf{do'}(you_1, [\mathbf{receive'}(you_1, \text{a college education})])])$

Where:

The **z** argument represents the speaker with this mental state at utterance time **Ts**.

and **infc′** means epistemic inferred certainty

b.   ◊ [**do′**(you$_1$, [**receive′**(you$_1$, a college education)])]

In (28) we see an example of pattern type 2b using the *Ba* form of the copula and a modal adjective in copula predicate-focus position and thereby casting into focus the epistemic possibility.

(28)   *B'fhéidir   go   mbeadh   sé   ann.*
Is:cop+able:adj   that:prt   be:subv-fut   he:pn   there:adv-loc
It could be that he would be there.

a.   ◊ (z, [**be-at′**([**there′**], he)])
Where:
◊ represents epistemic modal possibility
and The **z** argument represents the speaker with the belief state at utterance time **Ts**.

b.   ◊ [**be-at′**([**there′**], he)]

The major distinction for modality in Irish is not main verb marking but the nature of the complement. That is, modal distinction is due to the (root: deontic and dynamic) VN vs. (epistemic) finite complement clause. In the root modals, we saw that these were control constructions with an appropriate NP controller. The aktionsarten contrast is also important as the root modal clauses have a progressive imperfective quality within the embedded complement whereas the epistemic modals are perfective in nature within the embedded clauses.

5.   Discussion

We have reviewed the treatment of modality in the literature and, briefly, some elements of formal semantic theory with respect to modal logic. We have motivated a modal operator schema as a generalised binary operator with an arity of two and incorporated this into the RRG treatment of modality within the operator projection.

(29)   The representation of the modal operators Φ in ls
Φ (z$_{i/j}$, [**do′**(x [**pred′**(x$_j$, y)])])
where Φ represents a modal operator:
possibility ◊ or **necessity** □

(30)   Root □:   Modal-verb   NP$_1$ (NP$_2$)   VN

(31)   Epistemic ◊:   Modal-verb   NP$_1$ V$_{fin}$ NP$_2$ (NP$_3$)

We then examined modal expression in Irish and found the root and epistemic construction types over which modality is carried (32). We found that the modal meaning in Irish is a function of the construction as a whole unit.

(32)   The Syntactic Pattern of the Irish Modal Types
        Type   1a: Root: V always followed by a VN complement.
                1b: Root: Copula + VN clause:
                        Ba_{cop} + ADJ|N + VN clause
                1c: Root: Negative Copula + VN clause:
                        Ní féidir + ADJ|N + VN clause.
                1d: Root: Substantive Verb of 'to be' + ADV|ADJ|PREP + VN clause:
                        Tá mé in ann …
        Type   2a: Epistemic: V followed by a finite complement
                        (occasionally a VN under certain circumstances).
                2b: Epistemic: Copula + finite clause:
                        Ba_{cop} + *féidir* + finite complement
                2c: Epistemic: Negative Copula + finite complement clause:
                        Ní féidir + finite complement

Within these constructions, we differentiated between root (as including both deontic and dynamic types) and epistemic modality in Irish and analysed the Irish data within the RRG model.

Abbreviations

ADJ	Adjective	PASS	Passive
ADV	Adverb	PAST	Past Tense
CONJ	Conjunction	PL	Plural
COP	Copula verb of "to be, ="	PN	Pronoun
DET	Determiner	POSS	Possession
DTV	Ditransitive	PP/PREP	Preposition/Prepositional phrase
FUT	Future	PRED	Predicate
GEN	Genitive	PRES	Present
HAB	Habitual	REL	Relative Particle
IMPERS	Impersonal	RRG	Role and Reference Grammar
INGR	Ingressive/Inchoative	SG	Single
ITV	Intransitive	SUBV	Substantive verb of "to be, exist"
LIT	Literally	TNS	Tense
LS	Logical Structure	TV	Transitive
N	Noun	V	Verb
NP	Noun Phrase	VA	Verbal Adjective
NUM	Number	VN	Verbal Noun
PRT	Particle	VP	Verb Phrase

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RPs and the nature of lexical and syntactic categories in Role and Reference Grammar

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Many syntactic theories assume a universal set of lexical categories, and they further assume these lexical categories are the basis of endocentric phrasal projections in the syntax. Role and Reference Grammar [RRG] makes neither of these assumptions, and in this paper an RRG account of lexical categories is developed, and it is argued that only noun and verb can be considered to be truly universal. Furthermore, the non-endocentric syntactic categories of RRG are expanded to include referring expressions, thereby solving problems that have plagued lexical-category-based, endocentric analyses. Finally, the issue of gradience in lexical categories is addressed, and it is argued that category labels like "noun" and "verb" are descriptive labels for words that share a large number of morpholexical and morphosyntactic properties, not theoretical concepts.

1. Introduction

The issue of lexical and syntactic categories in Role and Reference Grammar [RRG] has not been explored in detail heretofore. Most theories assume that there is a universal set of lexical categories, Noun, Verb, Adjective and Pre/postposition, and that these same categories, along with their maximal projections, serve as the syntactic categories in human languages. An important assumption here is that all syntactic categories are endocentric, that is, they are the projection of a head (usually lexical but in some theories also grammatical) which has the same category as the head. In RRG, neither of these assumptions is made. First, it is not assumed that there is an a priori list of universal lexical categories like the ones mentioned above, and second, it is not assumed that syntactic categories are necessarily projections of a head; in other words, the theory does not assume that all phrasal categories are necessarily endocentric. The importance of the assumption that syntactic categories need not be endocentric has been highlighted by Everett's work on Wari' (Everett 2006, this volume), in which he shows that an adequate analysis of certain complex constructions in Wari', a Chapakuran language spoken in the Amazon, crucially depends upon the RRG notion of nucleus as a syntactic category which is neither endocentric nor restricted to lexical heads.

This paper will attempt to flesh out an RRG analysis of lexical and syntactic categories. It will be argued that there are no universally valid lexical categories beyond the fundamental categories of noun and verb, and their universality derives from the fact that among the major functions of language are reference and predication. Further while some syntactic categories are projections of a lexical head, the most syntactically significant ones are not. The discussion will proceed as follows. The next section will deal with lexical categories, and the following one will investigate the nature and status of syntactic categories such as NP and PP. The problem of gradience of lexical categories and its implications will then be discussed. Conclusions will be given in the final section.[1]

2.   Lexical categories

The issue of whether there are universally valid lexical categories is analogous to the founding issue of RRG, namely, the question of the universality of grammatical relations. The RRG approach to grammatical relations is that there are no universally valid definitions of the traditional grammatical relations, and that the grammatical relations in a language have to be established on a construction by construction basis. Thus, while all languages have actors and undergoers, and topics and foci, the ways that these interact with each other in particular constructions in particular languages vary. This variable interaction and grammaticalization underlies the range of systems from Dyirbal, Tagalog and English, in which there are pragmatically-influenced variable syntactic pivots and controllers, to Lakhota and Warlpiri, in which there are only invariable syntactic pivots and controllers, to Acehnese, in which there are only semantic pivots and controllers. And within a given language, different constructions may have different kinds of pivots and controllers, both in terms of patterning (e.g., ergative vs. accusative) and also in terms of whether they are semantic or syntactic, etc. Thus, while in some languages grammatical relations follow the traditionally expected pattern, in others they do not, and the theory allows for both possibilities.

It would be expected from an RRG point of view that there are in fact no universally valid criteria for parts of speech. Rather, it would be expected that the morphosyntactic properties of word classes and their semantic properties would interact in different ways in different languages. Following Himmelmann (in press), it is necessary to make the following distinctions. First, there are ontological or conceptual categories, like action, object and property, among others.[2] Words expressing these

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2.   See Braine (1990, 1992, 1993) for arguments that these categories are part of a "natural logic" of cognition and that they are important for language acquisition; see also Van Valin & LaPolla (1997, Epilog).

concepts will be termed action-words, object-words, and property-words, respectively. Second, there are the lexical categories of noun, verb, adjective, etc., which are defined in terms of their morphosyntactic properties, e.g., ability to take tense-aspect-mood inflection, necessity of co-occurring with a copula when used predicatively, ability to take case inflection, etc., and possibly morphophonological properties as well. The main reason for the lack of universal criteria is simply that not all languages have tense-aspect-mood morphology, not all have case morphology, not all have copulas, etc. Third, there are the syntactic categories, which in RRG are characterized in terms of the nuclei of cores (function: predicate), the nuclei of argument expressions, and the nuclei of adpositional expressions (function: argument or modifier).[3]

To the extent there are cross-linguistically valid generalizations in this area, it would be expected that they would be semantically driven, analogous to the RRG claim that the universally valid features of clause structure are semantically driven. So in analyzing a language, it would be necessary to determine the morphosyntactically defined word classes and compare them with the concepts of actions, objects, and properties and the fundamental functional distinctions of predicate, argument and modifier. How do they align? One can imagine that in some languages they will align rather straightforwardly, while in others there would be serious mismatches. So one might reasonably expect morpholexical verb to align universally with action-word and predicate, morpholexical noun with object-word and argument, and morpholexical adjective with property-word and modifier, all as defaults. (It is important to keep in mind that these implications are unidirectional only: while the default use of verbs is as predicates, predicates need not be verbs; the same is true for noun and argument.)

These are only defaults, and we expect to find different alignments in different languages. Examples of some different alignments, including some famous examples from Nootka (Swadesh 1939; see also Jacobsen 1979) and Tagalog (Schachter 1985), are given below.

(1) a. Wała:k-ma   qo:ʔas-ʔi.[4]   Nootka
         go-3sgpres   man-the
         'The man is going.'

     a′. Qo:ʔas-ma   wała:k-ʔi.
          man-3sgpres   go-the
          'The one going is a man.'

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3. Himmelmann assumes a phrase-structure-based notion of syntactic structure in his discussion, and accordingly talks about syntactic categories in terms of the terminal and pre-terminal nodes.

4. Abbreviations: aux = 'auxiliary', def = 'definiteness', deic = 'deixis', if = 'illocutionary force', m = 'masculine', MP = 'modifier phrase', nasp = 'nominal aspect', nom = 'nominative', nuc = 'nucleus', pastpart = 'past participle' prcs = 'pre-core slot', pred = 'predicate', pres = 'present tense', qnt = 'quantification', rdp = 'right-detached position', RP = 'reference phrase', tns = 'tense'.

a″. Qo:ʔas-ma.
man-3SGPRES
'He is a man.'

b. ʔi:ḥ-ma   qo:ʔas-ʔi.
large-3SGPRES   man-the
'The man is large.'

b′. Qo:ʔas-ma   ʔi:ḥ-ʔi.
man-3SGPRES   big-the
'The large one is a man.'

(2) a. Nagtrabaho ang   lalaki   Tagalog
worked   NOM   man
'The man worked.'

b. Lalaki   ang   nagtrabaho.
Man   NOM   worked
'The one who worked is a man.'

In the Nootka examples, a word expressing an action is used both as a predicate, as in (1a), and as an argument, as in (1a′), and there is no derivational morphology signaling nominalization or the like. Furthermore, a word expressing an object is used both as an argument, as in (1a,b), or as a predicate, as in (1 a′, a″, b′). Finally, a word expressing a property is used as a predicate in (1b) and as an argument in (1b′). The Tagalog examples are parallel. In the first example in each language, the expected alignment occurs, with an action-word as a predicate, while in the second example, the action-word functions as an argument, and an object-word functions as the predicate.

Facts such as these have been interpreted to mean that the languages in question do not distinguish between noun and verb, or do so only weakly. Himmelmann argues that this conflates two separate issues: the issue of whether there are morphosyntactic distributional asymmetries between, e.g., action-words and object-words, such that the former can be classified as verbs and the latter as nouns, on the one hand, and the issue of whether there are any constraints on the use of nouns and verbs as predicates, arguments or modifiers. He shows that there are morphosyntactic grounds for classifying some stems as verbs and others as nouns in Tagalog. Jacobsen (1979) argues the same for Makah and related Nootkan languages. What both languages have in common, as illustrated in (1)–(2), is that there seem to be no constraints on the use of nouns, verbs and other lexical categories as predicates or arguments, and similar considerations obtain for modifiers.

Himmelmann's and Jacobsen's analyses remove two of the most significant difficulties for the claim that noun and verb are plausible candidates for universal lexical

categories. Adjective is ruled out by the fact that numerous languages treat property-words as a subclass of verb, e.g., Lakhota, or as a subclass of noun, e.g., Dyirbal. Adposition is not a candidate, either, because there are languages which lack adpositions altogether, e.g., Dyirbal. It is perhaps not surprising, then, that only noun and verb would be the universal lexical categories, despite the lack of universally valid criteria for distinguishing them. This follows from the fact that a fundamental function of language is to convey information about states of affairs, and in order to do that it is necessary to refer and to predicate.[5] Languages have a class of lexemes the default function of which is to be used to refer, and another class the default function of which is to be used to predicate. The mapping between action-words, object-words and property-words, on the one hand, and noun and verb, on the other, need not be identical across languages, any more than the mapping between noun and verb and argument and predicate should be uniform.

3. Syntactic categories

With respect to the predicate function, RRG has no problem accommodating the examples in (1) and (2). The notion of nucleus is neither restricted to a single category, nor is it restricted to lexical heads. In the following examples, the nucleus and the predicate it houses are indicated by square brackets.

(3) a. Chris will [$_{NUC}$ [$_{PRED}$ see]] the movie. PRED in NUC = V
     b. Chris [$_{NUC}$ is [$_{PRED}$ a very good detective]]. PRED in NUC = NP
     c. Pat [$_{NUC}$ is [$_{PRED}$ exceedingly tall]]. PRED in NUC = ADJP
     d. Pat [$_{NUC}$ is [$_{PRED}$ in the house]]. PRED in NUC = PP
     e. Chris [$_{NUC}$ [$_{PRED}$ wiped]] PRED in NUC$_1$ = V,
         the table[$_{NUC}$ [$_{PRED}$ squeaky clean]] PRED in NUC$_2$ = ADJP
     f. Pat [$_{NUC}$ [$_{PRED}$ pushed]] PRED in NUC$_1$ = V,
         the table [$_{NUC}$ [$_{PRED}$ out the door]] PRED in NUC$_2$ = PP
     g. Chris [$_{NUC}$ was [$_{PRED}$ elected]] PRED in NUC$_1$ = V,
         [$_{NUC}$ [$_{PRED}$ president of the club]]. PRED in NUC$_2$ = NP

As these examples show, the predicating element in the nucleus of an English clause can belong to any of the four major lexical categories traditionally posited for English, and more-over some of them are phrasal (NP, PP, ADJP), while others are not (V). The tree structures for (3b) and (3d) are given in Figure 1. A crucial feature of the RRG analysis of these constructions is that *be* is not a predicate; rather, it is an auxiliary verb

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5. Baker (2003) proposes universal definitions of noun and verb in terms of properties of endocentric phrase structure which are simply structural restatements of this basic point.
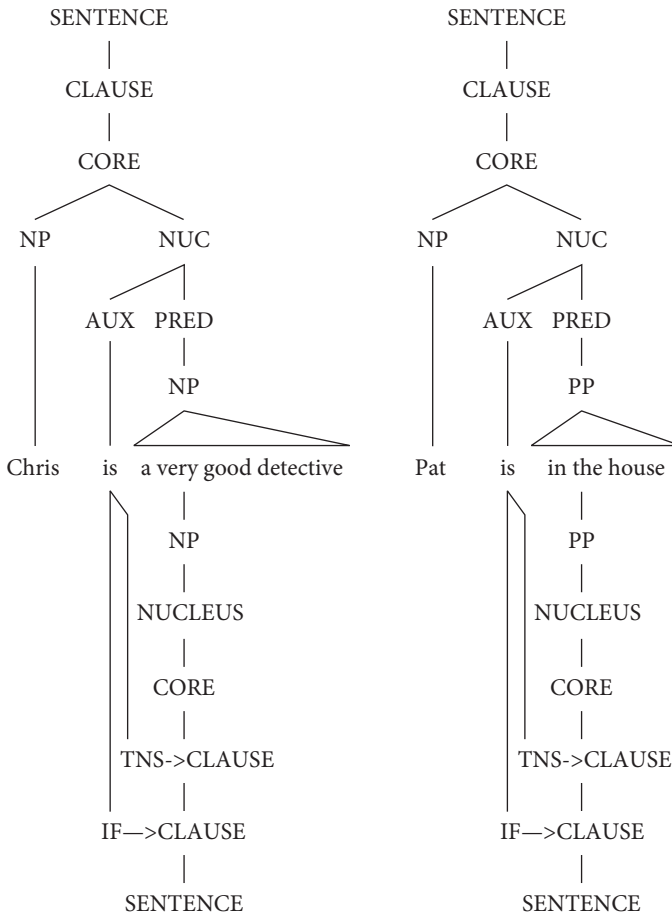
Figure 1. Constituent and operator projections for (3b) and (3d).

required in some cases for predicate formation when the predicate in the nucleus is not a verb. In many languages there is no copula in these constructions, as is widely known, and accordingly in such cases it is clear that the AdjP or PP is the predicate.

The clauses in Figure 1 are not projections of a lexical or functional head; hence they are not endocentric. Indeed, there is no head at all. The nucleus cannot be considered the "head" of the core or the clause, because it is not a lexical category, on the one hand, and is often phrasal, on the other. The notion of "head" is of no relevance to the layered structure of the clause. In Everett's analysis of Wari' intentional state constructions, mentioned earlier, the nucleus can be a whole clause or even a sentence (see Everett (2006, this volume) for details of the RRG analysis, Everett & Kern (1997) for the basic data). These are the most extreme possibilities for phrasal nuclei, but they are structurally analogous to the examples in Figure 1.

If the non-categorial notion of nucleus captures the variation in the predicates in (1)–(3), then what of the argument expressions? Are they projections of a lexical category? If so, then the "subject" in (1a′) is a VP and the one in (1b′) is an AdjP, and the former claim would seem also to be applicable to (2b) in Tagalog. If, on the other hand, one were to maintain that they are NPs, then because NP is a syntactic category which is a projection of the lexical category noun, one would seem to be committed to a claim that the non-nominal "subjects" in (1a′), (1b′), and (2b) have all undergone a process of nominalization which is not marked morphologically. Given that in these languages any lexical category can serve as an argument expression, this amounts to a claim that there is extensive zero-marked derivation of nominals from other lexical categories. Claiming that these are "determiner phrases" headed by the article does not solve the problem, because one is then committed to the claim that articles can take verbs or adjectives as complements, which is unusual, to say the least, and the only way around this claim is to posit massive, extensive zero-marked nominalization processes in the languages, which is the NP analysis. So the DP analysis turns out to be a crypto-NP analysis, with all of the concomitant problems.

It is not necessary to look at so-called "exotic languages" to find this problem Consider the example from German in (4).

(4) Der   Lange   ist   eingeschlafen.   German
     the.M.SG.NOM   tall   be.3SGPRES   fall asleep.PASTPART
     'The tall one has fallen asleep.'

The English translation of this sentence is unproblematic, because it contains a nominal element, the pronoun *one*. In the subject phrase in the German version, however, there is no nominal element, only a determiner and an adjective. To maintain endocentricity, one could claim that there is a phonologically null nominal head, so that the structure is the same as that of its English translation. Dryer (2004) reviews many cases like (4) and argues that the best analysis is that they are in fact headless, i.e., they contain no covert nominal element.

This problem can be avoided, if it is assumed that argument expressions, traditionally NPs, belong to a syntactic category which is not endocentric, i.e., not headed in the traditional sense, and which is not restricted to any particular lexical category. Indeed, if it is analogous to the clause, then the notion of head will be irrelevant. We need a new syntactic category with a different label. In RRG the layered structure of the NP is analogous to the layered structure of the clause in most respects, but it differs in having a nucleus that is a specific category, namely nominal. Suppose that the structure is maintained, but the category of the nucleus is treated analogously to that of the nucleus of the clause: there is no lexical category that is necessarily associated with it, although there may be strong tendencies, just as there is for the clausal nucleus. In other words, just as the most likely lexical category to serve as a clausal nucleus is a verb, the most likely lexical category to serve as the nucleus of this syntactic category would be a noun; but these are merely defaults or tendencies, not absolute correlations.

Such a construct would no longer be a "noun phrase", since it no longer necessarily has a nominal nucleus. This construct may be termed a "reference phrase" [RP].

There are a number of important advantages to RP over NP. The primary one is that the "subjects" in (1)–(2) and (4) can straightforwardly be considered RPs, regardless of the lexical category of the nucleus, and for the RPs with a non-nominal nucleus, it is no longer necessary to claim that there is zero-marked nominalization. A second advantage is that the parallel to clauses is stronger, since now both have non-categorial nuclei. Third, the layered structure of the RP would have the same operators previously attributed to the layered structure of the NP, because the operators, e.g., definiteness, deixis, quantification and number, are properties of referring expressions in general, not just of phrases with a nominal nucleus. For example, all of the "subjects" in (1)–(2) and (4) have a definiteness operator, regardless of the lexical category of the nucleus. Fourth, the notion of RP fully accommodates Dryer's (2004) argument against heads in linguistic theory, which is based on the fact that there are many "noun phrases" that lack nouns.[6]

Figure 2 gives the layered structure of the RP "the going [one]" in the Nootka example in (1a′). Note that the lexical category of the element is reflected only in the NUCLEUS$_R$, and it is probably be not essential. The semantic representation of the clause is also given.

In this representation, the unspecified effector of the verb *go* is indicated as the argument to which the operators apply. That is, the positive value of the definiteness operator, together with the default values of the quantification and nominal aspect operators, indicates that there is a specific, identifiable referent, i.e., an individual, expressed; however, the lexical item filling the nucleus is a verb, not a noun. The verb, however, has a lexically unfilled argument position which denotes the participant in the state of affairs expressed by the verb, in this case the effector of the action. The definiteness operator "binds" this argument position, making the effector of *wała:k-* "go" the specific, identifiable individual, yielding the interpretation "the one going".

Replacing "NP" by "RP" and "VP" by "clausal nucleus" eliminates a conflation that underlies many syntactic analysis of clause structure.[7] The original initial phrase-structure rule, S → NP + VP, confuses lexical category with syntactic function. A more accurate rule would be "S → Referring argument expression + Predicate phrase", where the prototypical referring argument expression is a referential NP and the prototypical predicate expression is a VP. In the first rule, the lexical categories of the heads of the prototypical expressions have replaced the functional descriptions, and this has lead to

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6.   For an analysis of the structure of RPs in Tagalog, see Dery (2007).

7.   "VP" and "clausal nucleus" are strictly equivalent only with an intransitive verb without a PP complement. A "VP" with a transitive verbs includes the nucleus plus a core argument, and in this instance "VP" and "clausal nucleus" are not equivalent. This does not, however, affect the point at hand. For an analysis of VPs in RRG, see Van Valin (2005: 80–81).

SENTENCE
|
CLAUSE
|
CORE

NUC   RP
| |
PRED $CORE_R$
| |
N NUC_R
| |
            V
| |
Qo:ʔas-ma   wała:k-ʔi
| |
N   V
| |
NUC NUC_R
| |
CORE $CORE_R$
| |
CLAUSE <-TNS   RP<—DEF
|
CLAUSE <——–IF
|
SENTENCE
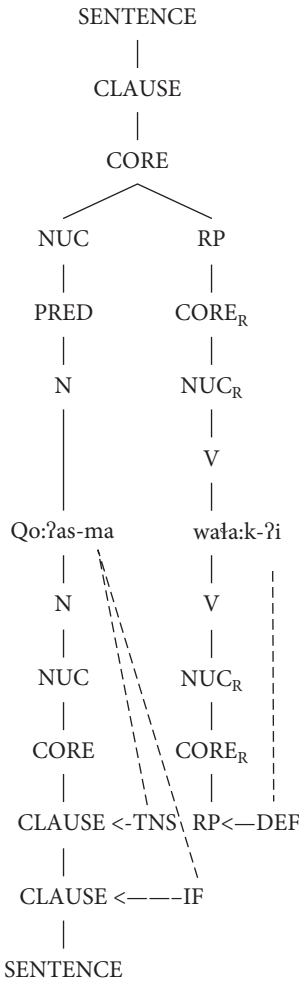
$\langle_{\text{TNS}}\ \text{PRES}\ \langle \textbf{be}' \ (\langle_{\text{DEF}} + \langle_{\text{DEIC}} \varnothing\ \langle_{\text{QNT}} \exists\ \langle_{\text{NASP}} \textit{COUNT}\ \langle (\textbf{do}'\ (\underline{x}, [\textbf{go}'\ (x)]))\rangle\rangle\rangle\rangle\rangle, [\textbf{man}'])\rangle\rangle$

Figure 2. Structure of (2b) in terms of RP and its logical structure.

the functional notions being reinterpreted in terms of the syntactic projections of spe-
cific lexical heads. That is, "NP" goes from being the prototypical category to serve as
sister to the VP to being the category that a phrase fulfilling this function has to be. It is
because of this substitution and reinterpretation that the data from Nootka and Tagalog
appear problematic. By replacing "NP" with "RP" and "VP" with "clausal nucleus" the
RRG analysis undoes this conflation and separates category from function.

There are at least two possible objections against replacing NP with RP. First,
many referring expressions are not phrases, e.g., proper nouns, pronouns, and
especially clitics and bound pronominals in head-marking languages. This is true, but

it is just as problematic for NP as for RP. Proper nouns and independent pronouns fill full argument positions, despite being typically non-phrasal, and so qualify as RPs. Furthermore, in some languages they may be phrasal. Many languages either require or permit articles with proper nouns, e.g., Modern Greek, German and Portuguese, and as noted in Van Valin & LaPolla (1997), some languages allow pronouns to take modifiers, e.g., Mandarin. Clitics and bound pronominals are not full RPs but simply pronouns, under either analysis. A more serious objection is that there are many instances of RPs which are non-referential, e.g., an indefinite RP in the scope of negation, an indefinite RP used as the nucleus of a clause, as in (3b), or a dummy pronominal RP in a sentence with a meteorological verb. The answer to this objection is to define RPs as *potentially* referential expressions, whose *default* interpretation is as referential. However, there are constructions in which the referential interpretation is blocked, as in the constructions enumerated above. Note that the RP *a very good detective* is non-referential in (4b) but referential in *A very good detective solved the mystery*. Similarly, the *it* in *it is snowing* or its German equivalent *es* in *es schneit* is the regular third person singular neuter pronoun;[8] it is the same pronoun that is used in sentences like *I ate it* or *Ich habe es gegessen*. The default interpretation of *it* and *es* is as referential, but when they occur in weather-verb constructions, for example, they are used non-referentially. Both *it* and *a very good detective* are RPs structurally in all of these sentences, and constructional factors determine whether they are interpreted as referential or non-referential.

There is at least one syntactic category that appears to be a well-behaved, endocentric projection of a lexical head, namely predicative adpositional phrases. Thus in *Chris saw Pat in the library*, *in the library* has a prepositional nucleus, which contains a preposition, *in*, which functions predicatively and licenses its object. Adpositional phrases of this type always have a adpositional nucleus, and hence there appears to be a correlation between the lexical category of the nucleus and the syntactic category of the phrase. There are, however, PPs that do not fit this picture. These are non-predicative PPs, in which the argument is licensed by the verb, not the preposition, and the preposition itself is assigned by rule. Examples of non-predicative PPs are given in (5).

(5)   a.   Chris showed the photo *to* Pat.
         b.   Chris stole the photo *from* Pat.
         c.   Chris presented Pat *with* the photo.

How should they be analyzed? Ross (1967) suggested that *to Pat* should be considered an NP, with *to* just being a case marker, analogous to the dative case in German and other languages. Van Valin (1990) suggested a similar analysis, but this was quickly abandoned, as it erased the important distinction between direct and oblique core

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8.   For an RRG analysis of the functions of German *es*, see Kretzschmar (2006).

arguments. A structural distinction between the two types of PPs was introduced in Van Valin (1993), following Bresnan (1982), and further developed in Van Valin & LaPolla (1997). The two structures are given in Figure 3; the operator projections of the RPs are omitted, as they are not relevant to the point at hand.
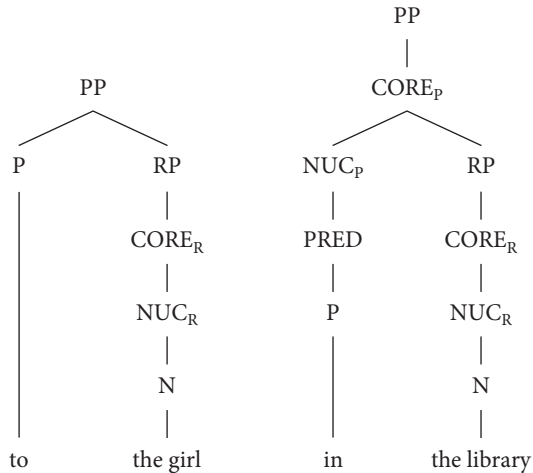
Figure 3. Non-predicative and predicative PPs in English.

The discussion in this paper so far points to a possible analysis of these two PP types. As noted, predicative PPs correspond most closely to the X-bar notion of an endocentric category: the nucleus in a predicative PP is always a P and is always a "head", while the resulting phrase is a PP. A modifier like *right* in *right under the table* can be handled in terms of a modifier in a periphery within the PP. It is not the case in a non-predicative PP that there is a prepositional nucleus: the only nucleus in the structure is that of the RP. Hence one could reasonably analyze them as *exocentric* PPs, i.e., PPs without a prepositional nucleus. Hence there is no layered structure, and this predicts that the admittedly limited set of PP-internal modifiers should not occur with non-predicative PP, which seems to be the case: *Chris showed the photo right to Pat/*Chris stole the photo right from Pat/*Chris presented Pat right with the photo*. Such an analysis captures Ross' insight that the RP is the most important part of the phrase while maintaining the distinction between direct and oblique core arguments.

PPs can be modifiers when they are predicative adjuncts. Predicative PPs occur in the core as argument-adjuncts of verbs and in a periphery as an adjunct; they may also function as the nucleus of a clause, as in (3d) and Figure 1. Non-predicative PPs are arguments regardless of whether they occur in the core of the clause, as in (5), or in the periphery$_{core}$ in a passive construction, as in *The burglar was arrested by the police*.

Here *by the police* is non-predicative, because *the police* is an argument of the verb *arrest* and the preposition *by* is assigned by the constructional schema for the English passive construction (see Van Valin 2005: 132).

Modifiers have not yet been discussed, but it would seem reasonable to suggest that there is a syntactic category of Modifier Phrase [MP], the nucleus of which would contain adjectives and adverbs as defaults. MPs would occur in the peripheries of RPs and of clauses. One might wonder why an MP would have a layered structure like an RP or PP. There are two reasons. First, in some languages there are modifier phrases with a nucleus containing an adjective taking a core argument (Matasović 2001). For example, while it is not possible to say **the proud of his son father* in English, it is possible in German: *der auf seinen Sohn stolze Vater* [the of his son proud father]. In this case, the nucleus of the MP contains an adjective with a core argument PP. Second, the modifiers in MPs can themselves be modified, which means that they must have a periphery to house the modifying MP, e.g., *the very quickly extinguished fire*.

The MP modifying a noun would have an adjectival nucleus, as in *the tall tree*, or a nominal nucleus, as in *the brick house*, while the MP modifying a verbal nucleus or a core would have an adverbial nucleus, as in *The mouse ran quickly into the closet*. It might be thought that adverb is a straightforward category, endocentrically projecting an AdvP, but there are in fact problematic cases like *yesterday*, *the day before yesterday*, *tomorrow* and *one day last week*, which may function either adverbially or as RPs (see McCawley 1988 for discussion). The issue of their categorial status evaporates if they are members of the exocentric syntactic category MP.

MPs can also contain other categories as well. This can be seen most clearly in the following examples from Lieber (1992), (6a), and from Everett (2006), (6b–c).

(6) a. The *Charles and Di* syndrome is no longer relevant.
     b. The *God is dead* philosophers are mostly dead.
     c. My grandson likes to give me the *who's the boss now, silly old grandpa* wink frequently.

In the first example, the MP has a conjoined RP in its nucleus. The second has a clausal nucleus, and in the last one the MP nucleus contains a WH-question plus a vocative expression in the right-detached position, meaning that it is in fact a sentence. The structure of the RP *the who's the boss now, silly old grandpa wink* is given in Figure 4; operator projections are omitted, and severals of the RPs and MPs are simplified.

This is the most extreme type of asymmetrical embedding, a sentence serving as a nucleus (analogous to the Wari' construction), but there is nothing in the notion of nucleus, be it of a core, RP or MP, that prohibits it; however, the strong cross-linguistic tendency toward symmetrical linkage (Van Valin 2005, §6.3) entails that it should be a highly marked structure, which it is.

```
                                                        RP
                                                        |
                                                      CORE_R
                                                        |
        PERIPHERY ---------------------->NUC_R
              |                                         |
             MP                                         N
              |
           CORE_M
              |
           NUC_M
              |
          SENTENCE
           /            \
      CLAUSE                    RDP
       /    \                    |
    PrCS   CORE<—PERIPHERY       RP
     |       |         |          |
     RP     NUC       MP        CORE_R
            / \        |          |
         AUX  PRED   CORE_M    NUC_M PERIPHERY->NUC_R
               |       |         / \        |
              RP     NUC_M     ADV  MP     MP   N
                       |        |    |      |    |
     the who's  the boss      now, silly   old grandpa  wink
```
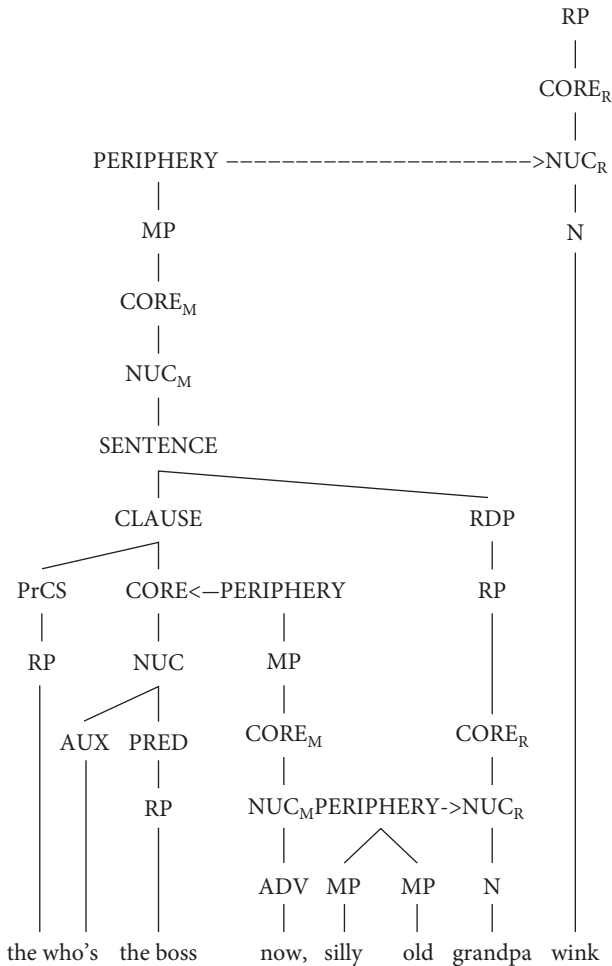
Figure 4. Structure of RP with MP containing sentential nucleus.

4. Gradience in lexical categories

It has long been known that the boundaries between lexical categories are not always sharp and well defined (e.g., Bolinger 1961; Ross 1972, 1973; Aarts et al. 2004; Aarts 2007; see Silverstein 2007 for an extensive critical discussion). As noted in section 2 above, lexical categories are defined in terms of their morphosyntactic rather than their semantic properties, and this leads directly to the problem of gradient categories, for as Bloomfield (1933) emphasized, every lexical item ultimately has a unique grammatical distribution. What we customarily label as "noun", "verb", "adjective", etc. are

those elements whose distributions overlap and are most similar, constituting the pro-
totype for the relevant category. This means, however, that there are less prototypical
members of the category. For example, contrast *sick* and *ill*. Both are considered to
be adjectives, but *ill*, unlike *sick*, cannot be used attributively, nor can it take com-
parative or superlative forms: *the man is sick/ill*, *the sick/*ill man*, *sicker/*iller/*more
ill*, *sickest/*illest/*most ill*. Morphosyntactically speaking, the only properties it shares
with *sick* are that it must occur with the copula when used predicatively and it can
take the suffix *-ness* to form an abstract noun, *sickness/illness*. *Ill* is an adjective, but a
peripheral member of the category.

   Even more troubling are what Ross (1972, 1973) called "category squishes", a se-
quence of forms whose properties change gradually in such a way that it is difficult to
decide whether certain forms belong to one category or another. A noun-verb squish
can be seen in (7).

(7)   a.   The savant quickly proved the theorem
      b.   That the savant quickly proved the theorem   (astonished the professors)
      c.   the savant/*the quickly proving the theorem   (astonished the professors)
      c'. the savant having quickly proved the theorem
      c". (I am aware of) the theorem having quickly been
           proved by the savant
      d.   the savant's/*the quickly proving the theorem   (astonished the professors)
      d'. the savant's having quickly proved the theorem
      d". the theorem's quickly being proved by the savant
      e.   the savant's/the quick proving of the theorem   (astonished the professors)
      e'. *the savant's quick having proved of the theorem
      e". the quick proving of the theorem by the savant
      e'''. *the theorem's quick proving by the savant
      f.   the savant's/the quick proof of the theorem   (astonished the professors)
      f'. the quick proof of the theorem by the savant
      f". the savant's/the quick proof (astonished the professors)

Prove is clearly a verb in (7a), and while it is also a verb in (7b), the construction has one
nominal property, namely, it can fill an argument position of a verb. *Proof*, on the other
hand, is clearly a derived nominal and has more in common morphosyntactically with
underived nouns like *table* than with the related verb *prove*. What is *proving*? It seems
to be verbal in (7c) and (7d). In both it can take a perfect auxiliary, which carries the
-ing suffix, causing the present participial/gerund form to appear as a past participle;
this is a clear verbal property. In both *proving* takes a "direct object", not a prepositional
(*of*) complement, but the fact that the "subject" is a bare NP in (7c) but a genitive NP in
(7d) shows that (7c) is more verb-like than (7d). To the extent that the NP "subject" in
(7c) can be replaced by a pronoun, it is accusative and not nominative, e.g., *I am aware
of him having quickly proved the theorem*; The accusative form cannot be attributed to
the preposition *of*, because the gerund with its genitive "subject" is possible here, too,
i.e., *I am aware of his having proved the theorem quickly*. Both can have passive forms, as

(7c″) and (7d‴) show, and neither can have its "subject" replaced by a determiner. Both take adverbs, not adjectives as modifiers. With the exception of the genitive "subject" in (7d), these are all verbal properties. The forms in (7e), on the other hand, seem to have crossed a threshold of some kind. They can have a genitive "subject" or a determiner, and their complement must be marked by *of*. The perfect auxiliary and passive are no longer possible, as (7e′, e″) show. Both arguments can occur in post-head PPs, as in (7e′), something impossible with (7c,d). Finally, it takes adjectives and not adverbs as a modifier. In all of these regards *proving* in (7e) is much more like *proof* or a noun like *table* in (7f) than like *prove* in (7a,b). However, it shares two verbal properties with (7d). First, in both the genitive "subject" is interpreted as the actor carrying out an action (not in the passive in (7d″)), whereas in (7f) this is not necessarily the case. *John's proof* can refer to a proof that John worked out or to a proof that he simply possesses, e.g., he got it out of a book or downloaded it from the internet. This reading is excluded in (7d,e). Second, in both (7d) and (7e) the complements, either direct or prepositional, cannot be omitted; **John's proving* is bad regardless of whether it is interpreted as a version of (7d) or (7e). This too is a verbal property, not found with (7f). Thus *proving* seems to be more verb-like in (7c,d) and more noun-like in (7e), despite the two verbal properties just mentioned. These properties are summarized in Table 1.

Table 1. Summary of noun-like and verb-like properties in (7)

Verbal Properties	(7a)	(7b)	(7c)	(7d)	(7e)	(7f)
Tense	X	X	–	–	–	–
Aspect	X	X	X	X	–	–
Voice	X	X	X	X	–	–
Adverbial modification	X	X	X	X	–	–
Nominative "subject"	X	X	–	–	–	–
Accusative "object"	X	X	X	X	–	–
Obligatory "object"	X	X	X	X	X	–
"Subject" = situation participant	X	X	X	X	X	X
Nominal Properties						
Function as argument	–	X	X	X	X	X
Genitive "subject"	–	–	–	X	X	X
Determiner	–	–	–	–	X	X
Prepositional "object"	–	–	–	–	X	X
Adjectival modification	–	–	–	–	X	X
Complements optional	–	–	–	–	–	X
"Subject" = possessor (possible)	–	–	–	–	–	X

To which category does *proving* belong? This question is necessitated by the assumption of endocentric phrase structure. As Silverstein (2007: 34) makes clear, "autonomous formal word-categoricalism is ... located in the commonsensical European tradition of parts of speech and their (endocentric) phrasal projections ..." *Proving* is the head of a phrase, and it must have a specific category label so that it can project the appropriate kind of phrase, presumably VP in (7c,d) and NP in (7e). It is necessary to posit two lexical items *proving*, one verbal and the other nominal, in order to satisfy the assumption that all phrasal categories are endocentric. This is itself not unproblematic, as Table 1 shows. Suppose, however, that the assumption of endocentrism is abandoned. There is then no reason to assign it to one category or another; what is important is that it is the nucleus of a core in (7c,d) and it is the nucleus of a RP in (7e). The set of morphosyntactic properties carried by *proving* overlaps with those of *prove* and those of *proof*. It would require no categorial information in the layered structures in which it occurs. In more general terms, a particular lexical item may have a number of e.g., "object-word" properties and a number of e.g., "action-word" properties. Since syntactic projections of this lexical item do not depend on its category, there is no need to assign it to one or the other. When its "object-word" properties are highlighted or most relevant, it would function as the NUC_R in an RP, when its "action-word" properties are most relevant, then it would function as a clausal NUC. For constructions like those in (6b,c) the question of category is clearly irrelevant, as the modifiers are clausal or sentential.

This raises a fundamental question about the status of lexical categories like noun and verb. If lexical categories do not predict syntactic projections and functions, what good are they? Why posit them? One could maintain that they are important in other ways: if something is classified as a noun, then it should inflect for case, number, gender, but not for tense, aspect or voice, vice versa for verbs. This sounds reasonable, but consider *sick* and *ill* again. Saying that both are adjectives does not predict that they should behave so differently from each other. Rather, it is because of two overlapping morphosyntactic properties that they are given the same label. The properties are crucial, not the label. Accordingly, one can view labels like "noun" and "verb" as descriptive cover terms for constellations of these properties, with no real theoretical status in RRG, rather like "subject" and "direct object" (see section 2). What is relevant to the grammar is the features themselves, not any category labels that might be overlaid on them. So "noun" is just a useful descriptive label for a certain pattern of lexical item distributions in a language, just like "subject" is a useful descriptive label for a certain consistent pattern of restrictive neutralizations in a language. Analogous to grammatical relations, some languages have well-defined and sharply differentiated lexical categories, while others do not. Moreover, the universality of noun and verb is interpreted in this analysis to mean that every language has elements with morpholexical and morphosyntactic properties which have the function of referring, and there is a corresponding group whose function is predicating.

5.   Conclusion

It has been argued that certain formal properties of argument expressions are best captured in terms of the notion of reference phrase rather than the traditional notion of noun phrase. The analysis deals equally with referring expressions "headed" by a noun and those with a different lexical category as their nucleus. Indeed, one of the virtues of this analysis is that it does not rely on the notion of head at all, analogous to the analysis of clause structure has not having a head. In the analyses of the layered structure of the clause and the RP, the syntactic category at the phrasal level(s) is not determined by the lexical category of the nucleus. The same is true for modifier phrases. Predicative PPs, on the other hand, have a prepositional nucleus, and therefore they appear to be endocentric, in much the traditional sense, while non-predicative PPs are best analyzed as exocentric. It is further argued that the notion of lexical category itself has no theoretical status in RRG and is just a convenient descriptive label for a constellation of morpholexical and morphosyntactic properties that many lexical items share. For example, "verb" is the label for elements with similar morpholexical and morphosyntactic properties, and it is these properties that are relevant to the grammar, not the category label.

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"Floating plurals", prodrop and agreement – an optimality-based RRG approach

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In this paper, I shall try to provide a RRG description of agreement marking and "morphological" argument realization in Spanish. In Spanish, subject agreement can be expressed by a suffix, but the same suffix can realize the PSA-argument. Object clitics, too, can realize arguments or serve as agreement markers. Valeria Belloro, following the research put forth by Company, pointed out an interesting problem concerning argument realization and object clitics in standard Latin American Spanish. Plurality of the Non-Macrorole-Argument can be realized at the clitic denoting the Undergoer-Macrorole. My contribution will thus be to sketch a general RRG-framework for clitics, argument realization and agreement. As far as Belloro's problem is concerned, I would like to show that the data can be described without presuming a kind of functional head at the level of constituent structure. In fact, speakers use the optimal clitic in each speech variety. What differs is the lexical entry for the clitics, and Grimshaw's approach to Spanish clitics and optimality must therefore be reformulated. Choosing the optimal clitic is part of applying a constructional schema that comes into play as part of the linking algorithm within the RRG framework.

1.   Introduction

Romance languages, with the well-known exception of French, are instances of the so-called pro-drop-parameter. In Spanish, for example, not only subject agreement can be expressed by a suffix, but the same suffix can also realize the Privileged Syntactic Argument (PSA) on its own.

(1)   a.   María$_i$ cant-ó$_i$ [agreement]
             Mary   sing.3SG.PAST
             'Mary sang'

       b.   Cant-ó [suffix as PSA]
             sing.3SG.PAST
             '(he/she) sang'

Object clitics, too, can realize arguments or serve as agreement markers. In Spanish and some other Romance varieties, clitics and full NPs co-occur, realizing the same

argument. In Spanish, clitic redundancy is obligatory with the personal indirect object and even with the direct object when it is realized as a stressed personal pronoun:

(2) a. Le_i   gustó   el   partido [a Juan]_i
         3DAT.SG like-3SG.PAST DET-MASC match   to John
         'John liked the match'

     b. Lo_i   vimos   [a él]_i
         3MASC.ACC.SG see-1PL.PAST to 3MASC.SG
         'We saw him'

Following Company (1998), Belloro (2004) pointed out an interesting problem concerning argument realization and object clitics in standard Latin American Spanish.[1] Plurality of the Non-MR-Argument can be realized in the clitic denoting the Undergoer-MR:

(3) a. Juan compró   una   casa para sus   hijos
         John buy.3SG.PAST INDEF.FEM house for   3PL.POSS.PL son.PL
         'John bought a house for his children'

     b. *Juan les   la   compró
         John 3DAT.PL 3FEM.ACC.SG buy.3SG.PAST

         European Spanish:
     c. Juan se la   compró
         John se 3FEM.ACC.SG buy.3SG.PAST

         American Spanish:
     d. Juan se la/   se las   compró
         John se 3SG.FEM.ACC/ se 3FEM.ACC.PL buy.3SG.PAST
         (cf. Belloro 2004: 22, examples 40d–d(i))

My paper will sketch a general RRG framework for clitics, argument realization and agreement. As far as Belloro's problem is concerned, I will show that the data can be described without presuming a kind of functional head at the level of constituent structure. In fact, the speakers use the optimal clitic in each variety. The problem has been already accounted for by Grimshaw's (1997) approach to Spanish clitics and optimality, which I will discuss in the second part of this paper. But, as we will see, Grimshaw's proposal of a unique lexical entry for the clitic *se*, which is valid for all constructions and all varieties of Spanish, does not match the data. I will prove that a different lexical entry will be needed. Hence, Grimshaw's approach will be reformulated. In the last part, I will try to integrate optimality into the RRG framework. Choosing the optimal clitic can be considered part of applying a constructional schema that comes into play as part of the linking algorithm.

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1.   The phenomenon occurs especially in the Spanish of Bogotá, Buenos Aires, Mexico-City and Santiago de Chile. Please refer to the analysis of the Habla-Culta-Corpus in Company (1998: 538–544).

2.   Morphology and RRG

In a paper dating from 2000, Joan Bresnan considers RRG,[2] in addition to LFG and some other theories of grammar, an instance of a "Parallel Correspondence Theory". Following Dan Everett:

> As a P[arallel] C[orrespondence] T[heory], RRG does not build grammatical representations up serially via a recipe of derivational steps (as in, say, Chomsky's (1995) Minimalist Program), but it instead simultaneously generates separate structures, viz. the components of the *Layered Structure of the Clause*, the lexico-logical representation (lexical semantics), the operator projection (tense, aspect, mood, definiteness, etc.), focus structure (discourse and interactional salience and scope relations) […] These parallel structures are connected via a set of Linking Rules – an algorithm connecting the structures, as the name implies …
>
> (Everett 2005: 12)

Unlike LFG (cf. Bresnan ibd.), which only combines two layers of representation, namely constituent structure (*c-structure*) and a structure of functional features (*f-structure*), RRG allots four layers: Constituent Projection, Operator Projection, a conceptual-semantic structure (*Logical Structure*) and Information Structure (cf. Fig. 1).

How can we justify this proliferation of levels in comparison with LFG? From my point of view, the advantage lies in the consequent separation of the different functional levels of sentence structure, whereas the feature-value-pairs of LFG's *f-structure* comprise morphosyntactic, semantic and pragmatic information, distinguishing just one other projection, *c-structure*, as an arrangement of all free morphemes.

In contrast, the Constituent Projection of RRG restricts the concept, representing only constituents that are motivated by referential semantics. Hence, auxiliary verbs such as *a* ("has") and *pu* (past participle of *pouvoir* "can") in Fig. 1 are not linked to any node of the Constituent Structure. Bearing grammatical and not referential meaning, they are only related to the Operator Projection.

There is another point that distinguishes the representation of the Constituent and Operator projections in RRG from the well-known X-Bar-trees of Generative Grammar.

RRG trees only fix the semantically motivated layers on a vertical axis: (NUCLEUS > CORE > CLAUSE > SENTENCE). Free as well as bound morphemes of an input sequence can be linked to different nodes of a certain layer. There is no one-to-one mapping between a morpheme and a lexical or functional head. Thus, RRG trees enable the representation of amalgams and discontinuous morphemes:

For the Spanish input sequence *estuve durmiendo* ("I was sleeping") in Fig. 2, the verbal suffix *-e* is linked to the argument position of the Constituent Structure.

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2.   Bresnan discusses RRG on the basis of Van Valin (1993), leaving out the improvements of Van Valin & LaPolla (1997).

CLAUSE

CORE

ARG   NUCLEUS   ARG   **Constituent projection**

PRED

NP   V   PP

Elle   a   pu   voir   sa mère
('She   was able to visit   her mother')   **Information structure**

V

NUCLEUS

MOD → CORE

TNS   →   CLAUSE   **Operator projection**

do′ (x, [**see′** (x, y)])   **Logical structure**
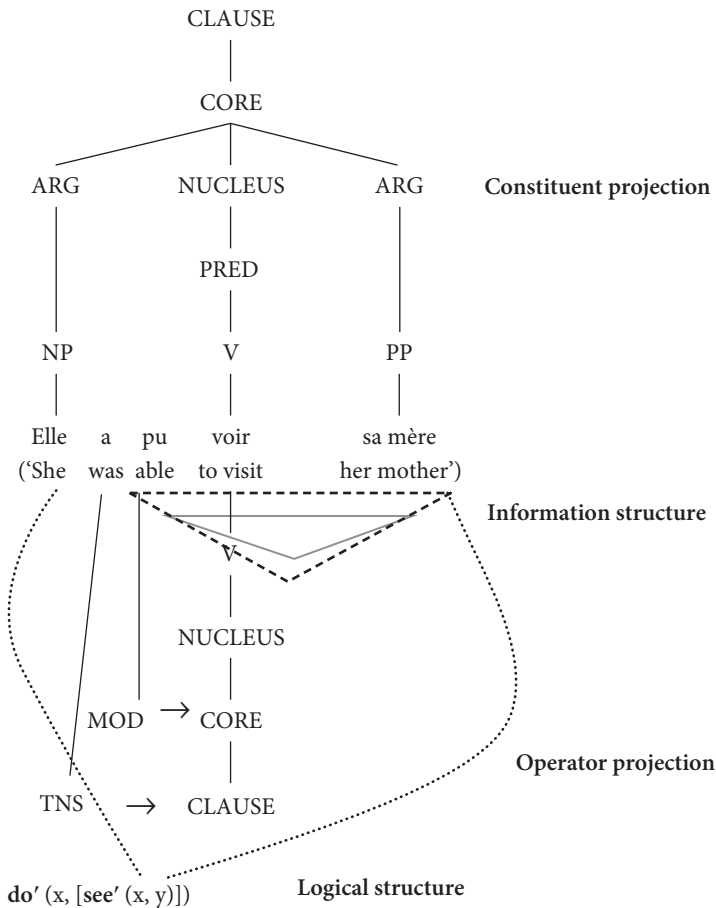
Figure 1. Projections in RRG.

However, the verbal stem of the auxiliary does not form part of the Constituent but of the Operator Projection. Together, the auxiliary stem and the gerund termination -*iendo* of the full verb *dormir* ("to sleep") mark Tense and Aspect of the predicate.

According to what we have seen so far, the Operator Projection seems to be the one and only structural level for representing grammatical morphemes that do not bear referential meaning. However, this is only one side of the coin. The Operator Projection deals with only a part of the morphemes bearing grammatical meaning, i.e., morphemes that are not "relational". Non-relational morphemes modify the Nucleus, Core or Clause, but they do not indicate a relation between two constituents.

The verbal categories of Person and Number are not classes of operators. Besides Case as part of noun inflection, they constitute mainly relational categories. As far as relational categories are concerned, the semantic representation comes into play. Relational categories reflect the relation of the predicate and its arguments. Therefore, the
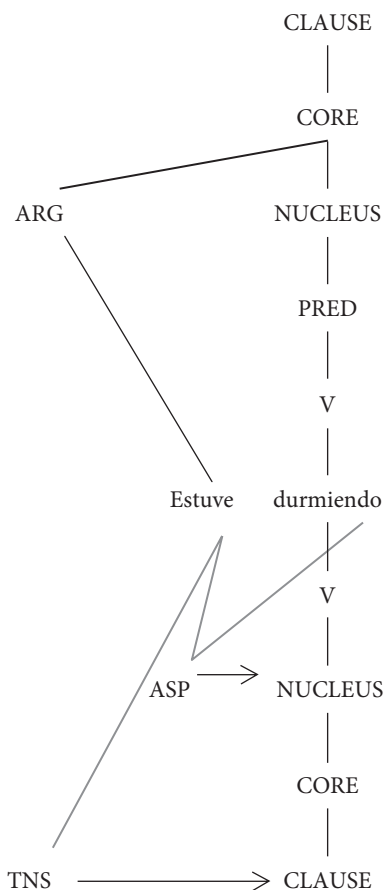
Figure 2. Amalgams and discontinuity.

realization (from semantics to syntax) or interpretation (from syntax to semantics) of Person and Number (Agreement) as well as Case cannot be represented in a "static" way, but must be dealt with as part of the Linking-Algorithm (cf. Van Valin 2005b: 25).

3.   "Head-marking" vs. "Dependent-marking"

In Fig. 2, we linked the verbal suffix *-e* (1PSg) of the auxiliary *estuve* ("was") to an argument position of the Constituent Structure. This was structurally required due to the fact that the argument slot of the full verb *dormir* ("to sleep") could not be filled by any other morpheme. RRG does not assume empty categories such as (little) "pro" in Generative Grammar. Hence, the example in Fig. 2 illustrates that a morpheme expressing Person and Number needs not to be a morpheme of Agreement, but could

denote an argument of the predicate in the center of the semantic representation. On the other hand, (4) as well as (1a) is an example for Agreement:

(4)   María$_i$ estuv-o$_i$ durmiendo [Agreement]
      Mary   be-3SG-PAST   sleep-Gerund
      'Mary was sleeping'

Concerning the morphologic marking of arguments at the verbal stem, RRG distinguishes between two types of languages: one type that marks the relationship between the predicate and its arguments exclusively at the verb as head of the construction (*head-marking languages*), and languages that mark this relation at the verb-dependent constituents, e.g., via Case morphemes (*dependent-marking languages*).

   Being a dependent-marking language, German (cf. example 5) always flags syntactic functions by means of Case morphemes or adpositions. On the other hand, head-marking Tzotzil, a Mayan language of Central America, displays argument-indexing affixes bound to the verbal stem (cf. example 6).

(5)   German (dependent marking):

   a.   Er   brachte   sie   ihr
        3NOM.SG   bring-3SG.PAST   3ACC.PL   3DAT.FEM.SG
        'He brought them to her'

   b.   Der   Mann   brachte
        DET.NOM.MASC.SG   man   bring-3SG.PAST

        der   Frau   Blumen
        DET.DAT.FEM.SG   woman   flower-ACC.PL

        'The man brought the woman flowers'

(6)   Tzotzil (*head-marking*) (cf. Van Valin 2005a: 16, example 1.14):

   a.   ʔ-Ø-s-pet
        ASP-3ABS-3ERG-carry
        'He/she carried him/her/it away'

   b.   ʔ-Ø-s-pet   lokel ʔantz   ti   tul-e
        ASP-3ABS-3ERG-carry   away   woman   DEF   rabbit DEF
        'The rabbit carried the women away'

In German (5a), pronouns are free morphemes receiving intonational stress, in contrast to Tzotzil's argument-indexing affixes (6a). In the b-examples of both languages (5b and 6b), full NPs do appear, but in Tzotzil (6b) the NPs are not marked by Case affixes or adpositions. In actuality, they appear outside the CORE, but inside the CLAUSE. Therefore, they differ from topicalized NPs appearing in the Right- or Left-Detached-Position. Nonetheless, in Tzotzil it is always the verbal affix that is mapped to the argument position, independent of the presence or absence of a corresponding full NP (cf.Van Valin 2005a: 16–18).

```
                        CORE
              ┌──────────┼──────────┐
            PRO         PRO       NUCLEUS
             │           │           │
             │           │          PRED
             │           │           │
        ʔ    Ø           s-          pet
```
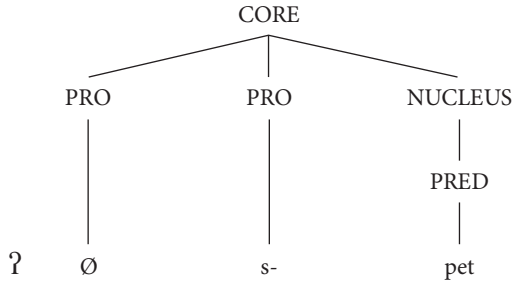
Figure 3. Head-marking in Tzotzil (cf. Van Valin 2005a: 17).

Note that Romance languages do not fit easily into one of the two types described:

(7)   Italian:

a.   Gliela   porta
     3.DAT.SG+3.ACC.FEM.SG bring-3.SG.PRES
     'He/she brings it to him/her'

b.   Gliela   porta,   la   marmellata,
     3.DAT.SG+3.ACC.FEM.SG bring-3.SG.PRES,   DET.FEM.SG jam

     a   sua   sorella
     to 3SG.POSS.FEM.SG sister
     'He/she brings it to her, the jam, to his/her sister'

c.   Porta   la   marmellata a   sua   sorella
     bring-3.SG.PRES   DET.FEM.SG jam   to 3SG.POSS.FEM.SG sister
     'He/she brings the marmalade to his/her sister'

On one hand, the verbal suffix *-a* of *portare* ("to bring") is linked to the PSA (cf. example 1b and Spanish *estuve* in Fig. 2). Van Valin (2005a: 19) considers this phenomenon, called "pro-drop" in Generative Grammar, to be a "head-marking feature" that appears as an exception in a certain construction of a generally dependent-marking language. However, the fact that Romance languages allow for object clitics shows that things are even more complex.

In (7a) all syntactic functions are expressed by morphemes that do not receive stress. There is an evident parallelism between Italian (7a) and Tzotzil (5a), although clitics hold an intermediate position between free morphemes and affixes. At the first glance, (7b) too seems to be analogous to the corresponding Tzotzil example in (6b). Italian, however, unlike Tzotzil, marks the Dative twice, namely by the clitic *glie-* on one hand and on the other hand by the preposition *a*, head of the PP *a sua sorella* that appears in the Right-Detached-Position. Hence, the Italian construction (7b) seems to bear resemblance to what is the case in so-called *double-marking languages* such as the North America Choctaw (cf. Van Valin ibd.). Double-marking

```
                            CORE
              ┌──────┬────────┴─────────┐
            PRO     PRO            NUCLEUS          PRO
             │       │                │              │
             │       │              PRED             │
             │       │                │              │
            glie     la             port-            a
```
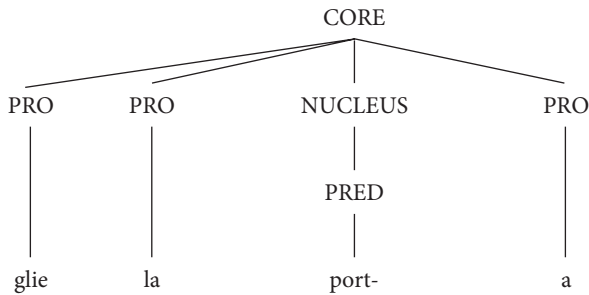
Figure 4. *Head-marking* in Italian.

languages flag syntactic function by means of verbal affixes, but the full NPs, which are realized inside the CLAUSE as in Tzotzil, are additionally marked by Case.

Finally, example (7c) gives evidence for the fact that in Italian, objects can be solely marked by word order and prepositions in clear contrast to what happens in head-marking languages or double-marking languages.

In summary, Italian could be classified in line with Van Valin (2005a: 19) as basically dependent-marking, resorting to head-marking constructions whenever the subject is not realized as a full NP or an object is expressed by a clitic.

4.   "Pronominal Redundancy" and "Cannibalistic Datives"

The Spanish examples in (2) that we considered at the beginning differ from the Italian example in (7) in the fact that the full NPs, being co-referential with the clitics, are not outside, but rather inside the (CORE). This can be proved by comparing the intonation patterns. Whereas the full NPs in (7b) are separated by a pause, there is no such a pause in (2).

Further examples are given by Belloro:

(8)   a.   Le   duele   la   cabeza   a   Juan
           3DAT.SG ache-3SG.PRES DET.FEM.SG head   to   John
           'John has a headache'

      b.   Le   preparé   una   tarta a   mi   amigo
           3DAT.SG prepare-1SG.PAST INDEF.FEM.SG cake   to 1SG.POSS friend
           'I prepared my friend a cake'

      c.   Le   gusta   el   cine   a   Juan
           3DAT.SG appeal-3SG.PRES DET.MASC.SG cinema to John
           'John likes the movies'

   d.   Lo   vi   a él
          3ACC.SG see-1SG.PAST to 3SG
          'I saw him' (cf. Belloro 2004: 8, examples 2–5)[3]

Nonetheless, the two corresponding NPs are not topicalized. They do not appear in the Right-Detached-Position (cf. Belloro ibd.: 19s). Thus, unlike in example (7b), the two NPs, not the clitics, should be considered arguments of the main predicates. The description of the examples in (8) should not differ from that of an Italian or Spanish construction containing a full NP as the PSA. All syntactic functions, subject, direct object, indirect object, etc. would be assigned to full NPs, which appear in the CORE according to the intonation pattern. Only if there is no corresponding full NP can the functions be fulfilled by affixes denoting Person and Number or clitics attached to the verb. Otherwise, clitics would have to be considered agreement markers in the same manner as Person and Number affixes.

    Having established a basis for our description, let us now account for the specific data from American Spanish. The examples under (3), repeated for convenience in (9), show that American Spanish not only uses dative and accusative clitics as agreement markers for three-place constructions, it is also characterized by the striking tendency to flag a plural RECIPIENT-argument and a singular THEME-Argument by means the clitic combination *se las* or *se los*:

(9) = (3)

   a.   Juan compró   una   casa para sus   hijos
       John buy.3SG.PAST INDEF.FEM house for   3PL.POSS.PL son.PL
       'John bought a house for his children'

   b.   *Juan les   la   compró
       John 3DAT.PL 3FEM.ACC.SG buy.3SG.PAST

European Spanish:
   c.   Juan se la   compró
       John *se* 3FEM.ACC.SG buy.3SG.PAST

American Spanish:
   d.   Juan se la/   se   las   compró
       John *se* 3SG.FEM.ACC/*se* 3FEM.ACC.PL buy.3SG.PAST
                               (cf. Belloro 2004: 22, examples 40d–d(i))

   e.   [**do′**(x, **buy′**(x, y))] PURP [BECOME **have′**(z, y)]

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3. It is not my objective to establish a clear boundary between the cases of obligatory and facultative pronoun doubling in Spanish. For this puzzling issue, variation among different sub-norms of Spanish should be taken into account (cf. Belloro 2004). For the prescriptive norm of European Spanish, see the considerations of the Real Academia (RAE 1973: 422–424).

According to the general linking rules, in unmarked active constructions the most patient-like argument of *comprar* ("to buy"), the y-argument appearing at the right edge of the LS in (9e),[4] receives the accusative case, whereas the z-argument, featuring a middle level of activity, receives the dative case.[5]

In combination with accusative *lo(s)/la(s)*, the dative clitic *le(s)* that allows Number variation is substituted by invariable *se* (cf. 9b). Hence, the Number of the z-argument cannot be expressed. It seems that for speakers of European Spanish this problem does not matter. However, American Spanish allows for expression of the Number of the z-Argument at the accusative clitic, although this renders this construction highly ambiguous:[6]

(10) a.   Juan se las   compró
          John *se* 3ACC.PL buy-3SG.PAST
      b.   → 'John bought a house for his children'
      c.   → 'John bought houses for his children'
      d.   → 'John bought houses for his child'

If we assume, as is the case in Generative Grammar (cf. Manzini & Savoia 2004), that every clitic is the head of its own functional projection, it is difficult to explain why plurality of the dative argument could be expressed at the accusative clitic.

In a RRG framework, Valeria Belloro has proposed the following quite elegant solution:

> I will […] argue that, regardless of whether they co-occur with independent NPs or not, Spanish clitics (as well as the "PSA agreement" on the verb) should be linked to an "agreement index" node (AGX). The AGX is a dependent of the NUCLEUS, and it receives the agreement specifications of all core argument positions present in the Logical Structure. (Belloro 2004: 43).

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4.   In this paper, I will make use of a simplified LS for verbs of buying (cf. Van Valin 2005a: 157). The PURP phrase codes the intention of the buyer to get himself or another person in possession of the bought object (cf. Van Valin & LaPolla 1997: 382–386). Hence it introduces a third argument, traditionally labeled BENEFACTIVE or BENEFICIARY, that in Spanish is realized as a dative CORE-argument or as an Argument-Adjunct marked by the preposition *para*. Belloro (2004: 47) uses a slightly modfied LS. Because the semantics of verbs of buying is not a topic of this paper, I will not discuss the nuances of the different LSs.

5.   The RRG linking algorithm processes the LS, assigning the Actor-Macrorole to the most active argument of a transitive i.e., in an active construction, the Actor of a transitive verb receives nominative and the Undergoer accusative. A third argument, that by definition does not receive a Macrorole, is realized as a dative or a PP. In RRG, traditional semantic roles such as BENEFACTIVE or THEME are just labels that correspond to different argument positions in a given LS (cf. Van Valin 2005a: 53–67; Kailuweit 2004).

6.   Hence, it is not correct when Company (1998: 544) declares in a lump-sum way that we are dealing with a case of "reanalysis of the morpheme -*s* which in this area of grammar adds the value of animacy-humanness typical of datives to its plurality".

Belloro's approach accounts for the fact that Spanish clitics can be realized as argument functions in the absence of corresponding full NPs. Therefore, they have to be linked to the respective nodes of the Constituent Projection (cf. Fig. 5).

```
                        CLAUSE
                          |
                        CORE
                          |
                       NUCLEUS
                    /           \
               AGX               PRED
                |              \    |
                |               \   V
                |                \  |
                |                 \ |
             se los              compró
```
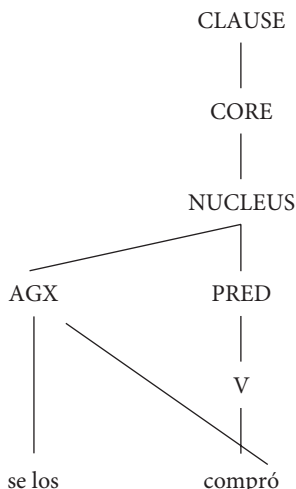
Figure 5. AGX-node (cf. Belloro 2004: 47).

Whether the AGX-node represents arguments or not must be verified during the linking process. For Semantics-to-Syntax-Linking, the algorithm will use discourse-pragmatic information to be able to tell whether a certain full NP should be realized inside or outside the CORE and therefore stands for an argument or not. As a result, the algorithm will retrieve a corresponding syntactic template, a Constituent Structure having one, two or even three argument slots. In Fig 6. *el regalo* ("the present") is topicalized and stays outside the CORE, whereas *María* is focal and realized inside the CORE. Hence, the BENEFACTIVE-argument of the LS is represented by the full NP *Maria*, but the THEME-argument is not.

The AGX-node stands for all arguments that, according to Information Structure, are not represented by full NPs. It contains the Person and Number features of all arguments of the LS, whereas Case features are ascribed during the linking process as a result of Macrorole assignment according to the choice of a marked or unmarked diathesis (active or passive construction) (cf. Fig. 7).

In the end, a morphophonological rule determines the realization of the AGX-features as verbal clitics (cf. Belloro 2004: 48).

Belloro's considerations about Syntax-to-Semantics-Linking are less detailed. Informally, we could assume the following: At the beginning of the Syntax-to-Semantics-Linking-Algorithm, the parser marks the CORE as a unit of information structure. If the CORE contains full NPs, these NPs will be linked to argument positions of the LS. Argument positions that are still empty after this step will be filled by clitics or Person and Number affixes of the verb.

```
                        SENTENCE

              CLAUSE                      RDP

              CORE

    ARG       NUCLEUS        ARG

              AGX      PRED

    Juan    se lo      compró a María,    el regalo
```
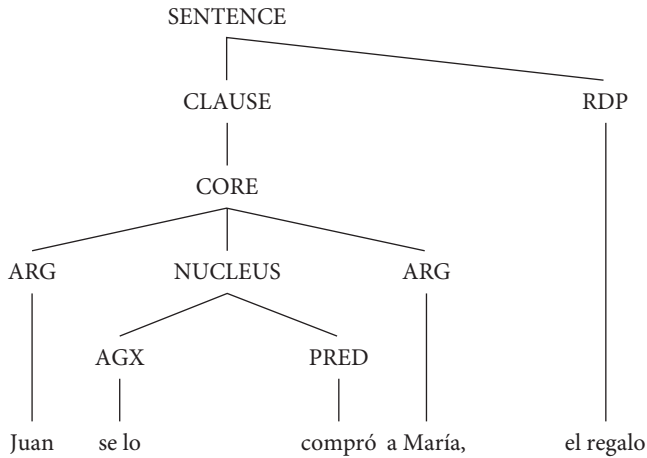
Figure 6. AGX-node and ARG-nodes (cf. Belloro 2004: 49).

[**do′** (x = {−1; −2; −pl; +m}, **buy′** (x ={−1; −2; −pl; +m}, y = {−1; −2; −sg; +m})] PURP [BECOME **have′** (z = {−1; −2; −sg; +f}, y = {−1; −2; −sg; +m})]

```
     Actor          Non-Macrorole-Core-Argument   Undergoer

     NOM                        DAT                  ACC

                             AGX
```
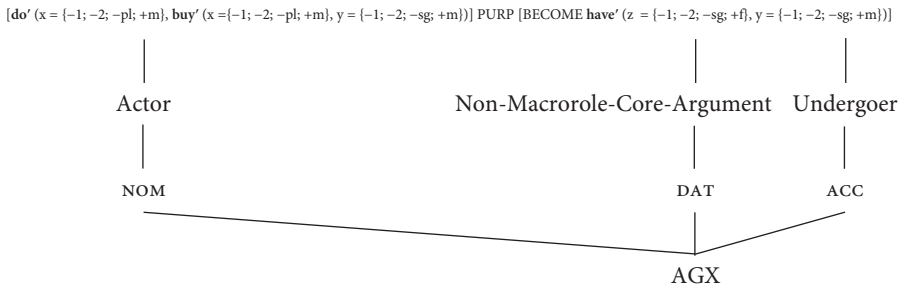
Figure 7. Coding of the morphosyntactic features in AGX.

The morphology-component that Belloro puts forward is based on Stump's (2001) *Inferential-Realizational Approach*. According to Stump (2001), inflectional features are not lexical units (morphemes) that, having a determined form and a corresponding grammatical content, could be attached to a lexical root. It is rather the case that a lexical entry receives inflection features by morphophonological rules that combine inflected forms with the root. Hence, the approach is inferential and not lexical (Stump 2001: 1). Furthermore, Stump (ibd.: 2) assumes that it is the association of a root with certain morphosyntactic properties at the level of content that licenses a certain morphophonological realization at the level of expression. Thus, the morphosyntactic properties are neither the result of attaching morphemes nor of applying morphophonological rules. In fact, they precede the morphophonological realization that makes it possible in the first place. Therefore, Stump's approach is realizational and not incremental.

In Fig. 7 we have already shed light on how Belloro makes use of Stump's approach. The argument slots of the predicate are associated with the agreement features. Now the anti-lexical component of Stump's approach comes into play, helping to describe the phenomenon of "cannibalististic datives" in the clitic chain *se los/se las*.

The different morphosyntactic properties that stem from the arguments and are associated with the predicate can be bundled and condensed in the form of realization rules that operate over the entirety of morphological material and are not bound to individual morphemes. Thus, the plurality of the Non-Macrorole-Argument can be realized as one feature of the clitic cluster *se los/se las*. *Los* is not a clitic having the features {−1, −2, +ACC, +PL, +M} as a traditional morphologic analysis would assume, but *se los* must be considered as a unit, realizing the whole of the morphological features associated with the arguments: {−1, −2, +DAT, +ACC, +PL, +M}.[7]

Belloro's account leaves the question open as to why the plurality of the Non-Macrorole-Argument is realized and not the singularity of the Undergoer-Argument. Without being more explicit as far as the realization rules are concerned, Belloro (2004: 56) refers to Company (1998), who claims that the Agreement features of the Non-Macrorole-Argument are always stronger that those of the Undergoer-Argument. According to Company (1998), this would also be proved by fact that clitic redundancy is always obligatory with the Non-Macrorole-Argument, whereas the Undergoer-Argument requires a redundant clitic only in a certain number of cases that are well determined by Information Structure rules.[8]

Nonetheless, neither Company (1998) nor Belloro (2004) account for the fact that the Undergoer-Argument imposes its plurality when the Non-Macrorole-Argument is singular (cf. example (11)): [9]

(11) a. Juan compró   los   juguetes para su   hijo
          John buy-3SG.PAST DET.MASC.PL toy-PL   for   3POSS.SG son
          'John bought the toys for his son'

---

7.   A similarly interesting phenomenon that could be compared to the "floating" datives in Latin American Spanish is that of certain genitive constructions in modern English. For example, in some cases involving group genitives, such as "the mother of John's friend", the possessive form ('s) could be considered as a type of "floating genitive". In this example, the possessor and possessum implied by the possessive ('s) is ambiguous (it could be understood as either Case 1: "[the mother of John]'s friend", or Case 2: "the mother of [John]'s friend"). Case 1 is a group genitive, i.e., the possessive ('s) does not directly follow its possessor noun but rather comes at the end of the entire NP, and therefore could be seen as "floating". For a more detailed explanation of the possessive ('s) in genitive constructions of English, please refer to Allen (2003) and Rosenbach (2002).

8.   Belloro (2004: 53) argues that Object-Agreement of the Undergoer-Argument only occurs when it is "accessible" or "inactive" in the sense of Chafe (1987), having a middle degree of activeness.

9.   Belloro (2004: 24s) mentions these facts, but leaving them unanalyzed. Company (1998) ignores them. Obviously, they do not confirm her thesis of the primary of the None-Macrorole-Argument.

b.→ Juan   se   los   compró
    John   *se*   3ACC.PL   buy-3SG.PAST

c.→ *Juan   se   lo   compró
    John   *se*   3ACC.SG   buy-3SG.PAST

By virtue of these data, the concept of a cannibalistic dative in Spanish has to be more than relativized. It is not the dative that imposes its number on the accusative. It is rather the fact that the feature plurality must always be realized, regardless of which of the two object arguments from which it stems. Hence, it seems to me more appropriate to call the phenomenon under examination a "floating plural".[10] I will come back to this problem at the end of section 5 of this paper.

5.   Linking, agreement and "Floating plurals"

In this section, I will claim that in RRG the phenomena under examination can be described in a somewhat more "conservative" way. In addition, my approach will be more precise than Belloro's. I will account for some data for which Belloro does not give an adequate description.

I will not deny that Belloro's approach is very interesting from a theoretical point of view and almost convincing as far as the descriptive results are concerned. Nonetheless, in my opinion, it unnecessarily clashes with some axioms of RRG in the field of morphology. The main problem is the postulated AGX-node at the level of Constituent Structure. This node, bearing some resemblance to a functional head in Generative Grammar, only represents Constituents when the argument positions of the predicate are not filled by full NPs. However, this case is well known in RRG and perfectly described for head-marking languages without any need for an AGX-node. In head-marking languages, argument-indexing verbal affixes still represent the arguments of the predicate (cf. Fig. 3). Languages showing the "pro-drop-parameter" in generative terms can be considered as basically dependent-marking languages with subject-verb-agreement. If and only if there is no full NP or stressed pronoun realizing the subject function, the verbal affix denoting Person and Number fulfills the subject function (cf. Van Valin 2005a: 19). Thus, for all sentences that represent the arguments of the predicate as free morphemes, an AGX-node is dispensable. In (12), the relation between the subject *Juan* ("John") and the verbal affix is a relation of

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10.   Grimshaw's (1997: 188) concept of "floating number" is too fuzzy, although her analysis that we will discuss in section 5 deals with the fact that it is only Plural that "floats".

agreement. As an instance of relational morphology, it should be dealt with by applying the linking rules.

(12)   Juan   vio   a   María
       John   see-3SG.PAST   *a*   Mary
       'John saw Mary'

An argument put forward by Belloro (2004) to justify her assumption of the AGX-node is precisely the problem of "floating plurals" in American Spanish. As we have already seen, for Belloro (2004), in the clitic cluster *se los/se las*, the dative and the accusative clitics are not independent morphemes, but form a unit realizing the morphosyntactic properties of the Non-Macrorole-Argument and the Undergoer-Argument simultaneously.

Nonetheless, the Actor-Argument is obviously not affected by this process of amalgamation. Neither of the object arguments has any impact on the verbal suffix denoting Person and Number, nor does the latter influence the preverbal clitic cluster. Thus, it is not comprehensible why in Belloro's representation of example (13) (cf. Fig. 8) the morphosyntactic information given by the Actor-Argument is related to the clitic cluster *se lo* and stored to the AGX-node.

(13)   Juan   se   lo   compró   a   María,   el   regalo
       John   se   3ACC.SG   buy.3SG.PAST   for   Mary   DET.3SG   present
       'John bought it for Mary, the present'
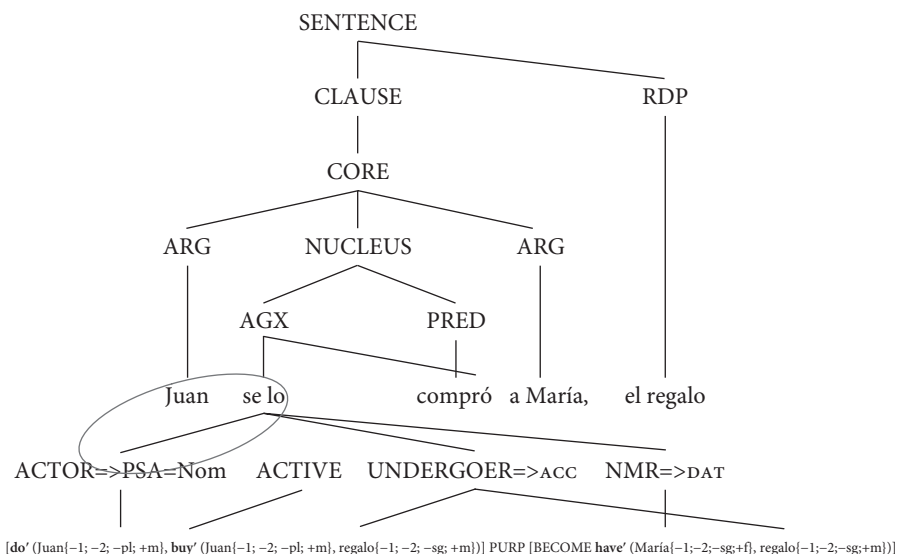
Figure 8. Association of morphosyntactic information with AGX through *se lo* (cf. Belloro 2004: 49).

In summary, in the Romance varieties under examination, subject agreement must be sharply separated from object agreement. Subject agreement is obligatorily realized via bound suffixes, whereas object agreement requires preverbal clitics. There is no evidence for a combination or interference of the two phenomena. Hence, a unified description of agreement by means of an AGX-node is problematic in my view.

But how can we otherwise account for the fact that the plurality of the Non-Macrorole-Argument is realized by the *-s* of the clitic chain *se los/se las*? My proposal consists of assuming a discontinuous constituent. In section 2, we dealt with discontinuous morphemes at the level of Operator Projection. Figure 2 illustrated the case that in Spanish, the category "Progressive Aspect" is realized by the auxiliary *estar* and gerundial suffix *-iendo*. At the level of Constituent Projection, Van Valin (2005a: 178) proposes a discontinuous analysis for the partitive construction in Italian:

$$[\textbf{do}' (Maria_{ACV} = A, \varnothing)] \text{ CAUSE } [BECOME \ \textbf{have}' (Maria, due_{INA} \ ne_{ACV} = U)]$$
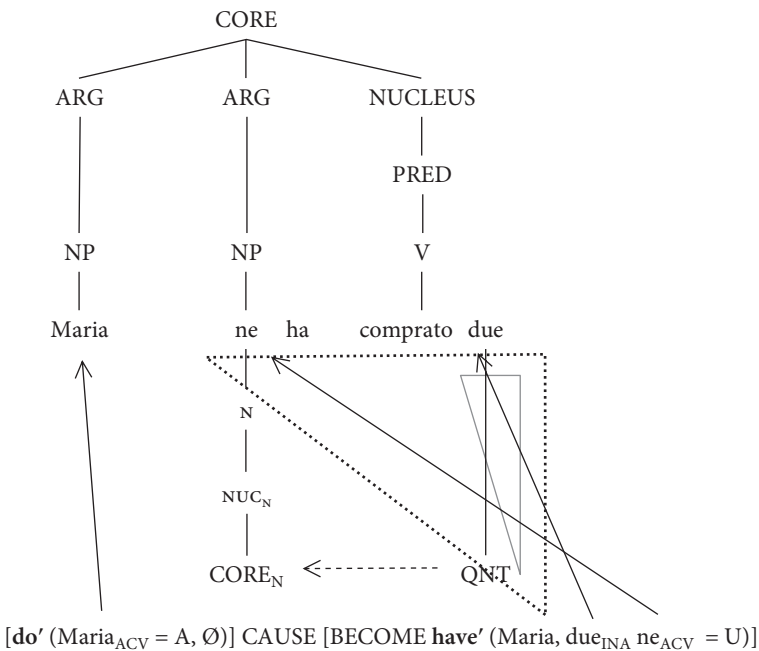
Figure 9. Partitive in Italian (cf. Van Valin 2005a: 178).

In *Maria ne ha comprato due* ("Mary has bought two of them"), one part of the Undergoer-Argument is focal (*due* "two"), but the other part is a clitic and therefore necessarily topical (*ne* = partitive). Thus, the argument has to be split up into two segments. It becomes a discontinuous constituent. Note that only *ne* is connected with Constituent Structure, whereas *due* (two) is classified as a nominal operator attached to the Operator Projection of the constituent *ne* (cf. Van Valin 2005a: 178).

```
                                    CORE
              ┌──────────┬──────────────┴───────────┐
            PRO        PRO         NUCLEUS          PRO
             │          │             │             │
            se        lo-s          PRED            ó
             │          │             │
            PRO         │           compr-
             │          │
          CORE_N  ◄──── NUM
```
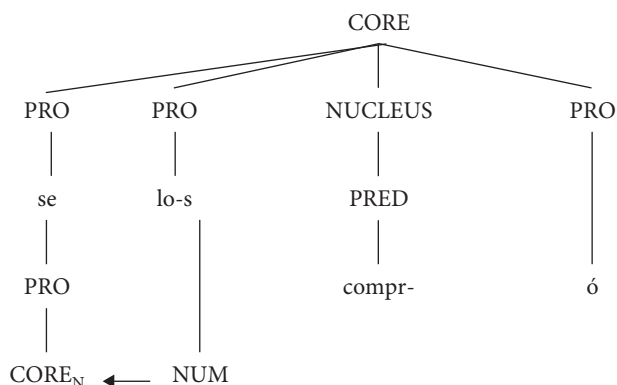
Figure 10. *se-s* as a discontinuous argument.

However, classifying a clitic as a head of a NP poses a problem. As far as Operator Projection is concerned, unlike full NPs, *ne* only allows the category of Quantification. Other nominal operators, such as Nominal Aspect, Number, Negation, Definiteness or Deixis,[11] are excluded. To resolve this problem, one could assume a category PRO at the level Constituent Projection that displays a deficient Operator Projection, permitting only a part of the operators of a standard full NP.

If we transfer these considerations to the problem of "floating" plurals, the clitic chain *se los* could be considered a discontinuous materialization of two arguments:

One major advantage of this view is that it still works when the clitics function as agreement markers. When an argument is represented by a full NP, the corresponding clitic is not connected to the Constituent Projection being part of the relational verbal morphology generated in the linking process. However, it can still have an Operator Projection. Hence, the lower part of Fig. 10 would be the same, independent of an argument reading or agreement marker reading of one or both clitics.

As mentioned previously, the number of the Non-Macrorole-Argument will only be materialized if it is plural. If the Non-Macrorole-Argument is singular, but the Undergoer-Argument plural, the clitic cluster has to be *se los/se las* and not *se lo/se la*.

(14) = (11)

  a.   Juan   compró   los   juguetes para su   hijo
    John   buy-3SG.PAST   DET.MASC.PL   toy-PL   for   3POSS.SG son
    'John bought the toys for his son'

---

11.   A list of NP-Operators can be found in Van Valin 2005a: 24.

    b.→ Juan se los   compró
         John *se* 3ACC.PL buy-3SG.PAST

    c.→ *Juan se lo   compró
         John *se* 3ACC.SG buy-3SG.PAST
         'John bought toys for his son'

Morphophonological rules must take these data into account and correctly predict the differences between European and American Spanish. These rules will be based on Grimshaw's proposal discussed in the following lines.

    In an Optimality framework, Grimshaw (1997) proposes a formalization that, at first glance, deals with the distribution of *se lo/la*: *se los/las* in European and American Spanish. Nonetheless, in the following I will show that her approach is both deficient at the level of description and problematic at the level of explanation.

    Grimshaw (1997) assumes an identical inventory of morphemes for both varieties. In addition, she posits a unique feature-value structure for the clitic *se* in all contexts: *se* is supposed to be unmarked for all features, i.e., for Reflexive (R), Person (P), Number (N), Gender (G) and Case (c). In contrast, *lo* is marked as non-reflexive, masculine and accusative, *los* as non-reflexive, plural, masculine and accusative:[12]

(15)   Inventory of Spanish clitics (extract) (cf. Grimshaw 1997: 190)
      se = (R), (P), (N), (G), (C)
      lo = –R, (P), (N), MASC, ACC
      los = –R, (P), PL, MASC, ACC

We can see immediately that this description is inadequate for various reasons. First, it does not do justice to the data. As Belloro (2004: 32) also points out, "floating" plurals only appear with *se* in a non-reflexive construction. If *se* has to be interpreted as a reflexive, then plurality of the Non-Marorole-Argument cannot be expressed:

(16) a. Ellos   se   compraron   un   libro
           3NOM.MASC.PL REFL buy-3PL.PAST INDEF.MASC.SG book
           'They bought themselves a book'

      b. Ellos   se   lo   compraron
           3NOM.MASC.PL REFL 3ACC.SG buy-3PL.PAST

      c. *Ellos   se   los   compraron
           3NOM.MASC.PL REFL 3ACC.PL buy-3PL.PAST
           (cf. Belloro ibd., example (48))

Following Grimshaw (1997), (16c) should be correct. Assuming a unique meaning for *se* in all contexts, there is no way of describing the differences in syntactic behaviour resulting from its reflexive or non-reflexive use. The second point concerns the feature

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12.   For convenience, I will only consider *se los*.

structure of the accusative clitics. In my opinion, it is inadequate to ascribe plurality to *los* in the varieties of American Spanish. Using *los* in the context of "floating" plural, speakers of American Spanish do not choose a "wrong" clitic that is plural and accusative because of the impact of the plurality of the Non-Macrorole-Argument. Rather, they choose the "right" clitic *se los*, expressing simultaneously the features dative, accusative and plurality of one of the two arguments. In other words, *se los* is not a combination of two clitics, but one complex clitic expressing properties of two arguments. Hence, the feature-value-structure of *se los* is not identical in American and European Spanish, as Grimshaw (1997) assumes.

In line with the mainstream Optimality Theory, Grimshaw (1997) proposes different rankings of constraints that are responsible for the variation. In contrast, I will account for the facts, assuming identical constraints but different feature-value-structures of the morphological material. The relevant features are illustrated in (17).

In European Spanish, *se los* displays the feature-value-structure [+DAT, [+ACC +PL]]. However, the identical sequence in American Spanish shows the feature-value-structure [+DAT, +ACC, +PL].[13] Plurality is not bound to accusativity.

(17)   European Spanish: se los = +DAT, [+ACC +PL]
        American Spanish: se los = +DAT, +ACC, +PL

Acting on this assumption, an identical chain of constraints can explain the different use of *se los/se las* in the two varieties. Following Grimshaw (1997), I will make use of the distinction of *Fill*-Rules and *Parse*-Rules.

(18)   Fill: Only features in the input can appear in the output Parse:
        All features in the input must appear in the output (cf. Grimshaw 1997: 170)

From the semantic point of view, there are four different cases of combining a singular or plural Non-Macrorole- and Undergoer-Argument:

(19)   a.   NMR-ARG = [+DAT +PL]; U-ARG = [+ACC +SG]
        b.   NMR-ARG = [+DAT +SG]; U-ARG = [+ACC +PL]
        c.   NMR-ARG = [+DAT +SG]; U-ARG = [+ACC +SG]
        d.   NMR-ARG = [+DAT +PL]; U-ARG = [+ACC +PL]

Ranking three constraints in the following way: *Fill Plural > Fill Accusative Plural > Parse Plural*, the use that each variety makes of *se los* can be correctly predicted.

The *Fill-Plural*-Rule prohibits the realization of a plural that is not given in the input. In (19c) both arguments are singular. Hence, for an input (19c) the output *se los* infringes upon the rule in both varieties.

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13. The assumption of Company (1998: 547): "*se los* seems to be lexicalized, a single pronoun, *selos*, totally unanalyzable for most speakers" seems to be too radical. In fact, *se los* can be considered one complex clitic. But it refers to two entities and can be analyzed as having the feature-value-structure [+DAT, +ACC, +PL].

	Output	*Fill PL.*	*Fill ACC. PL.*	*Parse PL.*
American Spanish	se los = +DAT, +ACC, +PL	*c!		
	se lo = +DAT, +ACC			*a!, *b!, *d!

	Output	*Fill PL.*	*Fill ACC. PL.*	*Parse PL.*
European Spanish	se los = +DAT, [+ACC +PL]	*c!	*a!, *c	
	se lo = +DAT, +ACC			*a, *b!, *d!

Figure 11. Optimal clitics for the input (19) in American and European Spanish.

The *Fill-Accusative-Plural*-Rule prohibits the realization of an accusative plural that is not given in the input. In American Spanish, neither *se los* nor *se lo* realize an accusative plural. *Se los* only realizes the plural of either of the two arguments. In contrast, in European Spanish *se los* realizes an accusative plural. For the input of (19a) and (19c), the Undergoer-Argument is singular. Hence, the rule is infringed upon if *se los* appears in the output. Finally, the *Parse- Plural*-Rule requires the realization of a plural if it is given in the input. In (19a), (19b) and (19c) one or both of the arguments are plural. Therefore, the constraint is violated in both varieties if the output sequence is *se lo*.

In American Spanish, it is the *Fill-Plural*-Rule that accounts for the choice of *se lo* in (19c). The *Parse-Plural*-Rule is decisive for the choice of *se los* in (19a), (19b) and (19d). In European Spanish, the same *Fill-Plural*-Rule causes *se lo* to be chosen in (19c), whereas the choice of *se lo* in (19a) results from the *Fill-Accusative-Plural*-Rule. Finally, the *Parse-Plural*-Rule guarantees that the optimal clitic is *se los* in (19b) and (19d).

The last question to be raised is how these considerations could be integrated into a RRG framework. Belloro (2004) does not explicitly say at which point morphophonological rules come into play. RRG's Linking Algorithms are only dealt with in a rudimentary way, as far as the filling of the AGX-node is concerned. In my approach, finding the optimal clitic as a morphophonological process is part of a so-called *Constructional Schema*. *Constructional Schemas* spell out the language-specific particularities of the general Linking-Rules (cf. Van Valin 2005a: 131–135):

However, the interaction of general Linking-Rules and *Constructional Schemas* is only sketched in Van Valin (2005a).[14] As a handbook, Van Valin (2005a) lacks explicit algorithms that could shed light on the integration of *Constructional Schemas* in specific languages. In following, I will propose that *Constructional Schemas* concerning the coding of the PSA by a verbal affix as well as the choice of optimal preverbal object clitics come into play at point 3 of the general Linking-Algorithm.

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14.   See the discussion of the role of constructional schemas in linking, using Sama examples, in Van Valin 2005a: Chapter V.
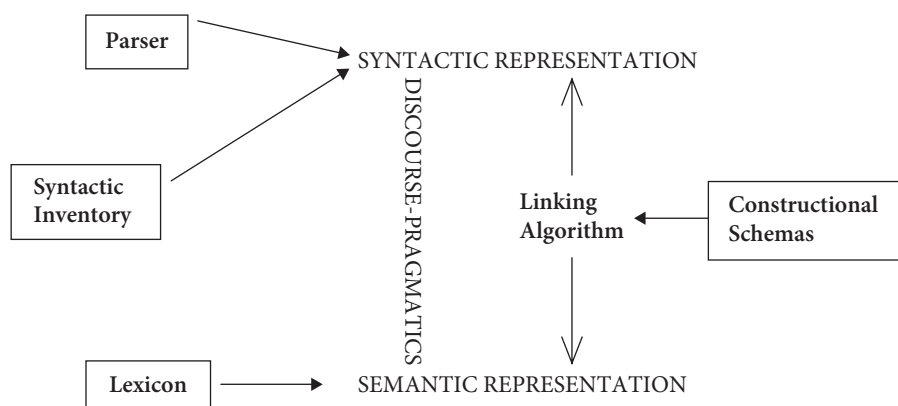
Figure 12. Architecture of Role and Reference Grammar (cf. Van Valin 2005a: 134).

(20)   Linking algorithm: Semantics → Syntax (cf. Van Valin 2005a: 136)

1.   Construct the semantic representation of the sentence, based on the LS of the predicator.
2.   Determine the actor and undergoer assignments, following the Actor-Undergoer Hierarchy.
3.   Determine the morphosyntactic coding of the arguments

   a.   Select the PSA […]
   b.   Assign the XPs the appropriate case markers and/or adpositions.
   c.   Assign the agreement marking to the main or auxiliary verb, as appropriate.

In order to determine the morphosyntactic coding of the argument, the LS of the predicator must be checked. If the LS does not contain a full NP that fulfills the PSA function, a "pro-drop"-*Constructional Schema* will be retrieved. In (21) such a schema will be sketched:

(21)   CONSTRUCTION: "pro-drop"

SEMANTICS:
The PSA-Argument is not represented by a full NP or this full NP has to be realized in a peripheral position because discourse pragmatics interfere and a *topicalization constructional schema* is retrieved.

MORPHOLOGY:
The PSA-Argument is realized as a verbal suffix of Person and Number.

SYNTAX:
The verbal suffix of Person and Number fills an argument position of the CORE.

PRAGMATICS:
The PSA-Argument is topical.

If the Undergoer-Argument is not selected as PSA and if there is a Non-Macrorole-Argument in the LS of the predicator, a *Constructional Schema* for object clitics has to be retrieved. (22) contains an outline of a *Constructional Schema* for Spanish object clitics.

(22)   CONSTRUCTION: *Spanish object clitics*

SEMANTICS:
Clitics are agreement markers if they are co-referent with a full NP that, due to discourse pragmatics, has to be realized inside the CORE. If there is no such full NP, or if this NP has to be realized in a peripheral position because of discourse pragmatics considerations (retrieving a *topicalization constructional schema*), the clitics are arguments. They stand for the Undergoer and/or the Non-Macro-role-Argument.

SYNTAX:
If clitics stand for arguments, they fill one or two argument slots of the CORE.

MORPHOLOGY:
If a dative Non-Macrorole-Argument is realized as a full NP, a dative clitic is attached to the verb. For an Undergoer-Argument realized as a full NP, this is only the case under special conditions depending on discourse pragmatics. The optimal clitic is chosen from a particular inventory according to the variety of Spanish (European or American). If two arguments require a clitic, a complex clitic is chosen.

PRAGMATICS:
The Undergoer-Argument only requires a clitic as agreement marker if it is "accessible" or "inactive" (cf. Belloro 2004: 51–54).

If the *Constructional Schemas* are processed, the Linking-Algorithm can be fulfilled:

(23)   Linking algorithm: Semantics → Syntax (cf. Van Valin 2005a: 136)
4.   Select the syntactic template(s) for the sentence […].
5.   Assign XPs to positions in the syntactic representation of the sentence […].

It would go beyond the scope of this paper to deal with Syntax-to-Semantics-Linking in almost the same manner. As far as the problem of "floating" plural is concerned, from a Syntax-to-Semantics point of view *se los* is always ambiguous, if the clitics stand for arguments. The Parser (cf. Fig. 12) would have to generate three different Operator Projections, connecting the plural marker *-s* either with *se* (cf. Fig. 10) or with *lo* or with both. For disambiguation we would need a Linking-Theory at the text level. At the moment, RRG is still lacking a detailed text linguistic component (cf. Butler 2003: 42).[15]

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15.   Some considerations concerning the relation of text linguistics and information structure can be found in Van Valin (2005a: 170–174).

6.   Conclusion

In this paper I have sketched a RRG approach for the description of some of the most-researched characteristics of Romance languages in the field of morphology: "pro-drop" and object clitics. I wanted to show that RRG provides two major descriptive advantages. On one hand, there is a sharp distinction between a level of referential meaning (Constituent Projection) and a level of grammatical meaning (Operator Projection). On the other hand, as far as morphology is concerned, non-relational morphology (operators) is separated from relational morphology. The latter is accounted for during the Linking-Process by means of Constructional Schemas. I will not deny that a more detailed description of morphology in the RRG framework has yet to be worked out.[16]

With regard to clitics, the realization of the plurality of the Non-Macrorole-Argument by means of the clitic cluster *se los/se las* in American Spanish is a puzzling problem for all theories of morphology. Together with Company (1998) and Belloro (2004), I have claimed that the phenomenon can only be described adequately if we assume a complex clitic *se los/se las* as realizing two arguments or being the agreement marker for both of them. Hence, a modification of the Optimality approach put forward by Grimshaw (1997) was required. The modified Optimality approach presented in this paper is able to account for a different distribution for *se lo* and *se los* in European and American Spanish and also takes into consideration that "floating" does not occur in reflexive constructions and that it affects only the plural and not the singular of the Non-Macrorole-Argument.

In contrast to Belloro (2004), I argued for a more "conservative" RRG account, avoiding the postulation of some kind of a functional head at the level of Constituent Projection. It has been shown that instead of using an AGX-node, the problem can be dealt with by assuming a discontinuous morpheme at the level of Operator Projection and a *Constructional Schema* that is retrieved during the Linking-Process. The double function of clitics as arguments and agreement markers can be described if we consider Romance languages as basically dependent-marking languages, allowing head-marking constructions under certain conditions that the present paper has sufficiently specified.

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16.   Everett (in progress) will probably fill this gap.

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Where is the precore slot?

Mapping the layered structure of the clause and German sentence topology

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The paper will account for the regularities of word order with German main declarative clauses by using the RRG framework. The question whether the so-called "Vorfeld" ("prefield")-position can be equated with the RRG-notion of precore slot (PrCS) will be explored. It will be shown that operator scope with the different readings of modal verbs indicates that the position before the finite verb should be regarded as core-external position. Furthermore, a structural analysis will be introduced that reveals that certain peculiarities of German word order can be captured most extensively when a precore slot is included in the syntactic description. With such an analysis, a structural explanation of pragmatically motivated word order alternations can be given for "VP-topicalization" and "*tun*-periphrasis".

1.   The layered structure of the clause and the core-external positions[1]

In RRG, it is assumed that clause structure cross-linguistically has to be represented in terms of a "layered structure". Its main components can be found in every language explored so far, and it does not involve any movement from abstract underlying representations. According to RRG, the main constituent units of a clause are semantically based: They involve the "nucleus", which contains the predicate, the "core", which contains the nucleus and the arguments of the predicate, and a "periphery", which subsumes non-arguments of the predicate.

   The units of the layered structure of the clause are syntactic units, albeit semantically motivated. The order in which these units occur in a given clause of a given language is not ruled by the layered structure of the clause.

Two additional units of the layered structure of the clause, however, are defined by their position in an actual sentence. Those two units are not universal, i.e., they are not attested in every language. From the languages examined so far, they seem to be pragmatically motivated. Those positions are called PrCS/PoCS (precore slot/postcore slot) and LDP/RDP (left/right detached position) (cf. Van Valin & LaPolla 1997; Van Valin 2005). The precore slot is of particular relevance for this paper.

In English, the PrCS is the position of fronted wh-words in questions and of other fronted elements, like in (1). The precore slot is inside of the clause-layer, but core-external. It is also described for pre-verbal elements in languages like Icelandic (Van Valin & LaPolla 1997) and Toura (Van Valin 1999).

(1)   Bean soup I can't stand.

(2)   Who will wash the car today?

The LDP is the position of sentence-initial elements. Those are clause-external; they are set off from the clause by a pause. The LDP can contain adverbials or semantic arguments of the verb. In the latter case, there is a resumptive pronoun in the core referring to the semantic argument in the LDP.

(3)   As for John, he is washing the car.

(4)   Today, who will wash the car?

In the following section, the "Stellungsfeldermodell", which is a useful model for the syntactic description of the regularities of German word order, will be introduced. After that, the applicability of the notion of "precore slot" for one position in the "Stellungsfeldermodell", namely the "Vorfeld" (prefield), will be discussed.

2.   The German "Stellungsfeldermodell"

The so-called "Stellungsfeldermodell" was invented by Drach (1937) in order to account for the topology of German sentences. In German main clauses, there is strict V-2 order: the finite verb has to be the second element in the clause. With periphrastic tense forms and other separable verbs a so-called "Satzklammer" (brace construction) is formed, as the parts of the verb do not stand adjacent to each other. Within the two braces, the order of constituents is relatively free. This part of the sentence is called "Mittelfeld" (middle field), the position before the finite verb is called "Vorfeld" (prefield), and the position after the second part of the separable verb is called "Nachfeld" (postfield). Besides that, there is an optional "Vor-Vorfeld" for left-dislocated elements. Those are separated from the rest of the clause by a comma, and are referred to by a resumptive pronoun in the prefield.

With subordinated clauses, the situation is different. They involve verb-final order, and the verbal elements stand adjacent to each other. Thus, in these clauses, the brace construction is formed of the clause-linkage marker (left brace) and the finite verb

(right brace) (5e). Subordinated clauses do not have a prefield. It is assumed that questions with verb-initial order (yes/no-questions) and imperatives do not have a prefield, either (5i,k). So, the prefield only exists in main declarative clauses.

In (5), the use of the "Stellungsfeldermodell" is illustrated for different types of sentences (see e.g., Dürscheid 1989, [3]2003; Eisenberg 1999/2001; Grewendorf et al. [7]1994; Pittner & Berman 2004; Wöllstein-Leisten et al. 1997).[2]

(5)   **German sentence topology**[3]

VVF	VF		LSK	MF	RSK	NF
	VVF	VF				
a.		John	wäscht	heute das Auto		
b.		John	hat	heute das Auto	gewaschen	
c. John,		der	hat	heute das Auto	gewaschen	
d.		John	hat	das Auto	gewaschen	heute
e.			weil	J. heute das A. gew.	hat	
f.		Das Auto	hat	John heute	gewaschen	
h.		Gewaschen	hat	John das Auto heute		
i.		Das A. gewaschen	hat	John heute		
j.			Hat	John heute das Auto	gewaschen?	
k.			Wasch	das Auto!		

In all kinds of clauses, the left brace has to be occupied, while the right brace may remain free (5h,i). In main declarative clauses, there has to be a constituent in the prefield, and the number of constituents in the prefield is restricted to one. Thus, sentences like (5i) present a problem for theories concerned with this model of sentence topology.

The "Stellungsfelder" have been invented especially for German. The three fields that emerge through the brace construction are a good starting point for the description of word order regularities, and they are useful for the description of issues of "movement". So, the "Stellungsfelder-Modell" has been used for descriptions based on generative grammar (Dürscheid 1989; Grewendorf, Hamm & Sternefeld [7]1994): The generative terms "topicalization" and "scrambling" are defined with respect to the

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2. Abbreviations are as follows: vvf = Vor-Vorfeld, vf = Vorfeld, lsk = linke Satzklammer (left brace), mf = Mittelfeld, rsk = rechte Satzklammer (right brace), nf = Nachfeld (Eisenberg 1999/2001). nom: Nominative, acc: Accusative, dat: Dative, m: Masculine, f: Feminine, n: Neuter, sg: Singular, pl: Plural, def: Definite, indef: Indefinite, dem: Demonstrative, pres: Present (Tense), past: Past (Tense), pstp: Past Participle, part: Particle, aux: Auxiliary, pastp: past perfective, neg: Negative, imp: Imperative, inf: Infinitive.

3. Translation and glossing for (5a,b)

(a)   John   wäscht   heute   das   Auto
      John   wash.3sgpres   today   def.n.sg.acc   car.sg
      'John washes the car today.'

(b)   John   hat   heute   das   Auto   gewaschen
      John   have.3sgpres   today   def.n.sg.acc   car.sg   wash.pstp
      'John has washed the car today.'

prefield and the middle field, respectively. As, on the other hand, the "Stellungsfelder-modell" gives an account of the special word order peculiarities in German, no claim has been made that it could fit with a universal description.

The layered structure of the clause involves positions that could be adequate for the description of German sentence topology. For example, the definition of the LDP fits nicely with the definition of the Vor-Vorfeld (5c above).

The notion of precore slot established for English is not entirely applicable for German, however. While the fronted element in a sentence like (1) is analyzed as precore slot (Van Valin 2005), there is no comparable position in German, as German has rigid V-2 order in main (declarative) clauses. Thus, the following sentences are ungrammatical:

(6)   *Bohnensuppe   ich   kann   nicht   ausstehen.
      Bean soup   1SG.NOM   can.1SG.PRES   not   stand.INF

(7)   *Das   Auto John hat   heute   gewaschen.
      DEF.N.SG.ACC   car.SG John have.3SG.PRES today   wash.PSTP

Accordingly, if there is a precore slot in German, it has to be the Vorfeld (prefield)-position. This is problematic, because the precore slot has been described as a pragmatically motivated position, while in German, it would be the first position in a main declarative clause that has to be filled, whatever the pragmatics of the clause may be. It will be argued later, however, that the content of this position is constrained in pragmatic terms.

In the following, two arguments for assuming a PrCS in German will be presented: The first one is semantic, while the second one accounts for theory-internal principles. I will firstly give an operator-based argument for the precore slot in German: With topical prefield-elements, the difference in reading with deontic and epistemic modal verbs can be described with respect to the prefield element. This is crucial for the description of the precore slot, as it is a core-external-position. As it belongs to the clause layer, it should be modified by a clausal operator. Thus, the epistemic reading of a modal verb should involve the PrCS in a different way than the deontic reading.

For non-topical prefield-elements, a system-internal analysis will be proposed: It will be argued that using the semantics-to-syntax-linking, the formulation of the rules is simpler and more elegant if it is assumed that there is a precore slot position in German.

3.   Vorfeld = PrCS? Evidence from core vs. clausal operators with topical Vorfeld-elements

As noted in Foley & Van Valin (1984), English modal verbs are ambiguous with respect to the operator category they express. Both "status" and "modality" can be expressed with a modal verb. This difference between deontic and epistemic readings of modal verbs has also been described for German (Diewald 1997, 1999; Eisenberg 1999/2001).

As the operator categories have different scope, there are syntactic constraints on their appearance and interpretation. Thus, if there are two modal elements in a single clause in English, the one with the epistemic reading has to precede the one with the deontic reading (examples from Foley & Van Valin 1984: 231):

(8) a. John may have to leave.
     b. John could be able to write that letter.

This ordering constraint is also valid for double modal constructions reported from dialects of the southern United States: The first of the two modal verbs is epistemic and the second deontic (Foley & Van Valin 1984: 231; Van Valin, personal communication):

(9) a. John might could do it.
     b. Don't get so far ahead – I may not could make it.
     c. You might should buy a new one.

These findings are presented as evidence for the layered structure of the clause (LSC): Deontic modal verbs express modality which is an operator at the core layer, while epistemic modal verbs express status, which is an operator at the clausal layer. As a consequence, deontic modal verbs would be expected to occur within the scope of epistemic ones (Foley & Van Valin 1984: 231; Van Valin & LaPolla 1997: 40 ff.).

In German, the non-finite part of the "modal-verb-construction" appears at the end of the sentence and thus represents the right brace. It expresses the action that is commented on by the modal verb.

(10) VF   LSK   MF   RSK

John   muss   das   Auto   waschen
John   must.3SG.PRES DEF.N.SG.ACC car.SG wash.INF
'John must wash the car.'

The sentence in (10) exemplifies the use of the modal verb *müssen* ("must") in German. In a deontic interpretation of the modal verb, the sentence would have to be paraphrased as in a); b) paraphrases the epistemic reading:

(10) a. John has the obligation to wash the car.
      b. There is some obligation/strong reason to assume that John is washing the car.

The paraphrases in (10a) and (10b) illustrate what is stated in Van Valin & LaPolla (1997) about the scope of core vs. clausal operators: Deontic modal verbs predicate a relation between the actor and the action or, as in (10a), the idea of the action. They are core operators. The epistemic readings of the modal verbs are a predication along the realis/irrealis dimension that is made of the entire reported event involving the act itself and its participants (cf. Foley & Van Valin 1984: 230). Modal verbs with an epistemic reading have the whole proposition in their scope. Status, which involves the realis/irrealis dimension, is a clausal operator, and thus it modifies the clause as a whole (cf. Van Valin & LaPolla 1997: 48; Diewald 1999 observes the same for German).

Again, there is the question: Can the "Vorfeld" be represented as the precore slot in RRG-terms? In order to decide whether the German Vorfeld is core-internal or clause-internal, there has to be a semantic decomposition of this particular position with respect to the deontic vs. epistemic reading of modal verbs. As only the epistemic reading can effect the core-external position, because it is a clausal operator, there should be a way to determine the PrCS- vs. core-position of the Vorfeld-Element by testing deontic and epistemic readings of modal verbs in different sentence types of German.

While with a deontic reading, the modal verb seems to point to the right and modify the action that is stated in the non-finite verb, with an epistemic meaning the modal verb rather points to the left, where the Vorfeld-element is located. In this latter reading, it says that something has to be true about this Vorfeld-element, which means that it expresses the obligation (or at least a strong reason) for the speaker to believe that something is true with respect to the Vorfeld-element. This is illustrated in (11).

(11)   epistemic

John **muss** das Auto waschen.
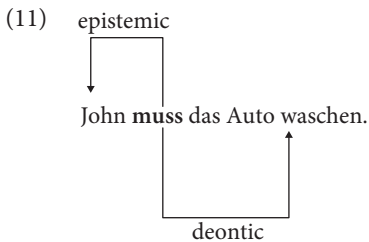
deontic

The scope of *muss* ("must") can be clarified by using the following paraphrases which involve a semantic decomposition of the deontic and epistemic readings with respect to *muss*:[4]

(11)   a.   deontic reading:
              Für John gilt: Er **muss** das Auto waschen.
              For John is true: He has to wash the car.

        b.   epistemic reading:
              Für John gilt = **muss** der Fall sein: Er wäscht das Auto.
              For John is true = has to be the case: He washes the car.

Note that in both the deontic and the epistemic reading, the topic of the sentence is *John*. Both readings are understood as statements about *John*. The semantic decomposition reveals that the relationship between the finite modal verb *must* and the topic changes with the two readings. In the deontic reading, *must* is included in the statement that is made about John, while in the epistemic reading, it gives a comment on the statement that is made with respect to John, saying that this whole statement follows from external reasons that oblige the speaker to assume that this statement can be made about John. Thus, in the epistemic reading, the obligation is on the speaker, not on John. Accordingly, it is found on some other level, which could be described

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4.   The *muss* in the paraphrases is always a deontic *muss*!

as extra-core level. As status modifiers have been described as clausal operators, this is not surprising.

In the following two examples, only the peripheral element that occurs in the pre-field is exchanged: In (12), it refers to the future, while in (13), it refers to the past. With each of these sentences, one of the readings of the modal verb *müssen* is excluded, while the other one is forced.

(12) Morgen   muss   John   das   Auto   gewaschen haben.
     tomorrow must.3SG.PRES John   DEF.N.SG.ACC car.SG wash.PSTP   have.INF
     'John must have washed the car tomorrow.'

   a. deontic reading:
       Für morgen gilt: John muss das Auto gewaschen haben.
       For tomorrow is true: John has to have washed the car.

   b. epistemic reading:
       *Für morgen gilt = muss der Fall sein: John hat das Auto gewaschen.
       *For tomorrow is true = has to be the case: John has washed the car.

In (12), the epistemic reading is excluded. The semantic decomposition reveals why this is the case: Speakers cannot make an assumption about the truth of something which is to take place in the future. The deontic reading is acceptable, however, because it is possible that a speaker know about something that another one has to do in the future.

(13) Gestern   muss   John das   Auto   gewaschen haben.
     yesterday must.3SG.PRES John DEF.N.SG.ACC car.SG wash.PSTP   have.INF
     'John must have washed the car yesterday.'

   a. deontic reading:
       *Für gestern gilt: John muss das Auto gewaschen haben.
       *For yesterday is true: John has to have washed the car.

   b. epistemic reading:
       Für gestern gilt = muss der Fall sein: John hat das Auto gewaschen.
       For yesterday is true = has to be the case: John has washed the car.

Here, the epistemic reading is possible while the deontic reading is not. It is not possible to talk about the obligation that somebody else has, referring to a past day. Deontic obligation necessarily refers to the future. On the other hand, it is well pos-sible to refer to a past day and make a strong assumption about what might have been going on that day. This is what the epistemic reading expresses.

As can be seen from these examples already, the semantic decomposition in terms of "für x gilt/muss der Fall sein" ("for x is true/must be the case") always involves the Vorfeld element. The "x" element is always the Vorfeld element, be it subject, adverbial or object, cf. (14):

(14) Das   Auto   muss   John   waschen.
     DEF.N.SG.ACC car.SG must.3SG.PRES John   wash.INF
     'The car, John must wash it.'

a.   deontic reading:
Für das Auto gilt: John muss es waschen.
For the car is true: John has to wash it.

b.   epistemic reading:
Für das Auto gilt = muss der Fall sein: John wäscht es.
For the car is true = has to be the case: John washes it.

Thus, the difference between the two readings has to do with the position of the modal verb with respect to the Vorfeld-element in a semantic decomposition. Would that be the case if the Vorfeld-element were core-internal, i.e., not the precore slot?

Tests with subordinated clauses reveal that core-internal elements behave differently with respect to the kind of semantic decomposition introduced above. Recall that subordinated clauses do not have a Vorfeld; the left brace is formed by a CLM like *weil* ("as", "because"), and the right brace is formed by the finite verb. The field inside the braces is the "Mittelfeld" (middlefield).

(15)   (...), weil   John   das   Auto   waschen   muss
because John   DEF.N.SG.ACC car.SG wash.INF   must.3SGPRES
(...), 'because John has to wash the car'

a.   deontic reading:
weil gilt: John muss das Auto waschen.
because it is true: John must wash the car

b.   epistemic reading:
weil gilt = der Fall sein muss: John wäscht das Auto
because it is true = has to be the case: John washes the car

The subordinated *weil*–clauses do not make statements about participants. Rather, they give reasons for other facts, and thus the semantic decomposition can be given as in (15).

Weil has scope over the embedded clause; it presents it as a reason for something that is expressed in the main clause. As in these clauses which do not have a Vorfeld, it is not possible to "extract" a single element for the semantic decomposition, it is reasonable to assume that core-elements in general cannot be extracted. The element to which the meaning difference with modal verbs is tied thus lies outside of the core. If one compares the scope of *müssen* in a deontic vs. epistemic reading, the difference can be defined with respect to the Vorfeld-element: In an epistemic reading, the utterance as a whole is in the scope of the modal verb, while in a deontic reading, everything but the Vorfeld-position is in the scope of the modal verb. This suggests that the Vorfeld-position should be regarded as core-external position: The deontic modal verb modifies everything that is within the core, and the epistemic modal verb modifies everything that is within the clause.

Thus, the Vorfeld-position with clauses that have one would have to be regarded as being core-external, and accordingly, it should be equated with the RRG-notion of precore slot.

4.   Structural evidence for a PrCS-position in German

In the last section, the modal verb reading (deontic vs. epistemic) has been para-phrased resulting in sentences that are semantically decomposed with respect to the PrCS-position: In a deontic reading, the modal verb is part of the proposition, whereas in an epistemic reading, the modal verb is rather part of (or modifies the) evaluation the speaker gives about the truth of the whole proposition. In all of the examined cases, the utterances were made "with respect" to the thing in the prefield position. Thus, the tests only work when the element in the PrCS is the thing that the proposition is about, i.e., the topic. As in German, the prefield element is not necessarily topical, one could argue that the "diagnostics" for the PrCS position are too topic-related, which means that they can figure out the PrCS-position only when it is filled with a topical element. The definition of a structural position, however, should be independent of the pragmatic status of its content.

Thus, a structural description of the German main declarative clause in RRG-terms will be applied. It will be shown that the formation of a rule-set works better for the various possibilities of fronting elements when a PrCS-position is assumed in the syntactic inventory.

As for the mapping of the German Stellungsfeldermodell and the Layered Struc-ture of the Clause, it will be assumed that the core corresponds to the Mittelfeld. If the nucleus appears in the left or right brace, those will be assumed to belong to the core. Auxiliaries do not belong to the core in terms of the constituent projection.

In a semantics-to-syntax-linking for German, the following general rules are given for word order in V-2 main declarative clauses (assuming that there is a precore slot):

(16)   Linking rules for German main declarative clauses:
        Semantics to Syntax (simplified version; for the full version see Van Valin & Diedrichsen 2006)

   5.   Assign LS elements to positions in the syntactic representation.
   a.   Assign the Nucleus to a position in the clause.

      1.   If the nucleus is finite, assign it to the first position in the core.
      2.   If the nucleus is non-finite, assign it to the last position in the core (de-fault) or the precore slot (subject to focus structure restrictions).
      3.   If the nucleus is non-finite, place the finite auxiliary before the first slot in the core; non-finite auxiliaries are placed after the nucleus. If the nucleus is in the PrCS, non-finite auxiliaries can either be placed adjacent to it or after the last position in the core, but need not be adjacent to each other.

   b.   An element must be assigned to the precore slot, [+W] > other.

   c.   Remaining arguments are assigned to the core and periphery:
      1.   General constraints:
            pronoun > other, NP > PP
      2.   Case-based argument ordering constraint: NOM > DAT > ACC (default)
      3.   If ACC = pronoun, then ACC > DAT (default)

These rules also account for sentences with a non-finite auxiliary:

(17) Gewaschen   haben   muss   John   das   Auto   gestern.
      wash.PSTP   have.INF   must.3SG.PRES   John   DEF.N.SG.ACC   car.SG yesterday
      'John must have washed the car yesterday.'

Does a theory-internal description of the German main declarative clause need a precore-slot? In an alternative "non-precore-slot" account, the sentence in (17) was analyzed assuming that there is no precore slot in the syntactic inventory.

(18) Semantics-to-Syntax-Linking
      (no precore slot in the syntactic inventory)

      5. Assign LS elements to positions in the syntactic representation.
      a. Assign the Nucleus to a position in the clause.
          1. If the nucleus is finite, assign it to the second position in the core.
          2. If the nucleus is non-finite, assign it to the last position in the core (default)
              or the first position (subject to focus structure restrictions).
          3. If the nucleus is non-finite, place the finite auxiliary after the first ele-
              ment in the core X!; non-finite auxiliaries are placed after the nucleus.
                  If the nucleus is in the first position of the core, non-finite auxiliaries
              can either be placed adjacent to it or after the last position in the core,
              but need not be adjacent to each other.

The set of rules in (18) makes wrong predictions for a sentence where the nucleus is the first element and there is a non-finite auxiliary that is placed adjacent to it. The position of the "X!" marks the point where this rule-set conflicts with the word order given in (17): The position of the finite auxiliary cannot be described with respect to the core, if a non-finite auxiliary occurs before it. If we assume that the first element in the construction is always the first element in the core, the possible positions of non-finite auxiliaries can only be captured if an "exceptional rule" is added. The exceptional rule for a sentence like (17) would have to be formulated as follows:

(19) Exceptional rule for sentences with a non-finite auxiliary, when nucleus+non-
      finite auxiliary are fronted:

      Place the finite auxiliary after the first element in the core. If there is a non-finite
      auxiliary in that position, place the finite auxiliary after the non-finite auxiliary.

In the "Precore-slot"-Analysis, all of the possibilities of word order, be it with or without non-finite auxiliaries and with any position of the nucleus, are captured. Its set of rules makes correct predictions: No additional exceptional rules have to be posited.

The rules in 5.a.1–3 of the Precore-slot-analysis also work if two non-finite auxiliaries occur in the sentence. In a *bekommen*-passive construction,[5] the passive

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5. For a description of the grammaticalization of the so-called "*bekommen*-passive" with various examples cf. Diedrichsen (2004, 2008).

auxiliary *bekommen* is structurally part of the nucleus. Thus, it precedes the tense auxiliary. So, the rule in (16 5.a.3) accounts for the following sentence as well:

(20) Gewaschen bekommen   haben   muss   er
       wash.PSTP   get/receive.INF have.INF must.3SG.PRES 3M.SG.NOM

       das   Auto.
       DEF.N.SG.ACC car.SG

       Lit.: 'Washed got/received have must he the car.'
       'It must be the case that somebody washed the car for him.'

5. Interim conclusion: Arguments for a PrCS-position in German

In this paper, I have tried to give reasons to assume that there is a precore slot in German. The position of the precore slot is the preverbal position in a V-2 main declarative clause. This position has been called "Vorfeld" in the "Stellungsfeldermodell" that has been used to account for German word order with respect to the brace construction formed by separable verbs since the 1930's.

The German precore slot deviates from the current RRG-definition of precore slot in the following respects:

- it is not pragmatically marked
- it is not a "special clause initial position" (cf. Van Valin 1999), but rather a position that is filled in every main declarative clause

Despite these differences from English and other languages, it has been found reasonable to assume a precore slot for German grammar:

I. Precore slot and operator scope (with topical prefield elements)
The Vorfeld position is the locus of the meaning difference that occurs with modal verbs: A semantic decomposition revealed that with topical prefield elements, deontic modal verbs, being core operators, express a relationship between a core argument and the action denoted in the main verb. Arguments in the precore slot are semantic core arguments, and as such they can be modified by a core operator (cf. Van Valin & LaPolla 1997; chapter 2.2). Modal verbs with an epistemic meaning (being clausal operators) have scope over them, which leads to a different interpretation: The speaker gives an evaluation about the truth of the whole proposition made with respect to the element in the Vorfeld.

However, the test introduced in section 3 of this paper only works for topical prefield elements. As German allows focussed elements in the prefield, too, a structural account has been introduced that justifies the precore slot position using system-internal arguments.

II. Theory-internal reasons for a precore slot in German

In a structural account, the crucial advantage of the PrCS-analysis is that the position of the finite verb can be described independently of other word-order peculiarities: If one assumes a PrCS, the finite nucleus is always the first element in the core. This is true for WH-questions, other (verb initial) questions, and every kind of main clause, irrespective of the kind of fronted material. Assuming a precore slot for German grammar simplifies the rule set: Between the precore slot and the core there is a space for non-finite auxiliaries that one would have to create within the core otherwise. They would have to be placed either "inside the core, but before the finite auxiliary" or "after the core". The notion of core, then, would be irrelevant for the position of the non-finite auxiliaries from a structural perspective. The same holds for the position of the finite auxiliary: In a non-precore-slot-account, its position would be defined rather vaguely, and exceptional rules would be in order, cf. "after the first element in the core, but only if there is no non-finite auxiliary". A precore-slot account is superior here, too, as it simply places it "before the first element in the core" for every possible instance. As the auxiliaries *per definitionem* are not components of the core, their placement *before* or *after* the core is much more elegant and accounts for the design and the general principles of the theory more consequently. As for the various possible positions of the nucleus, the precore slot-analysis has advantages, too: In case that the nucleus appears clause-initially, the PrCS-account offers a solid position for it, namely, PrCS; and it also offers a solid position for the finite auxiliary. Both of these important components thus are given positions that are not subject to any displacements if non-finite auxiliaries (or NP+Nucleus-fronting) occur. The non-finite auxiliaries can be placed either between those two solid positions or after the core.

6. Some remarks on "VP-fronting" with "ergative verbs" and the "*tun-periphrasis*"

6.1 VP

The possibility of fronting nominal elements with non-finite verbs has been a challenge for grammatical theories for a long time. Among generative grammarians, the fact that the fronted nominals may not be the "subject" of the sentence has been regarded as a proof for the existence of a VP in German (cf. for ex. Dürscheid 1989).

So, fronting the "direct object" or a dative argument with the non-finite nucleus is acceptable, while the "subject" of the sentence cannot be fronted:

(21) a. Das   Auto   gewaschen hat   John noch nie.
        DEF.N.SG.ACC car.sg wash.PSTP have.3SG.PRES John yet never
        'John has never washed the car.'

   b. Dem   Nachbarn   geholfen hat   John noch nie.
        DEF.M.SG.DAT neighbour.M.SG.DAT help.PSTP have.3SG.PRES John yet   never.
        'John has never helped the neighbour.'

    c.   *John   gewaschen hat   das   Auto   noch nie.
          John   wash.PSTP have.3SG.PRES DEF.N.SG.ACC car.SG yet   never

There are intransitive verbs, however, whose "subjects" can be placed in the prefield with a non-finite verb. Those have been described as "ergative verbs". "Ergative verbs" in a generative account are those German verbs that select the auxiliary *sein* ("be") in the perfect. It is claimed that their argument occurs as a "subject" on the surface, but is actually a "direct object" in deep structure. Diverse tests are applied in order to show that the "subjects" of "ergative verbs" behave syntactically like direct objects. The possibility of fronting the intransitive subject with the non-finite verb is one of the "diagnostics" for ergative verbs in German (cf. Grewendorf 1989; for criticism Kaufmann 1995; Diedrichsen 2002, 2006).

(22) a.   Das   Auto kaputtgegangen ist   John   noch nie.
           DEF.N.SG.NOM car.SG break.down.PSTP be.3SG.PRES John(DAT) yet   never
           'It never happened to John that his car broke down.'

      b.   Ein   Unfall   passiert   ist   mit
           INDEF.M.SG.NOM accident.SG happen.PSTP be.3SG.PRES with
           diesem   Auto noch nie.
           DEM.N.SG.DAT car.SG yet   never
           'An accident has never happened with this car.'

The construction with "subject" and non-finite verb in the prefield is also possible with some "passive subjects", which supports the "deep object"-analysis:

(23)   Autos   repariert   wurden   in dieser   Firma
         Car.PL   repair.PSTP become.3PL.PAST in DEM.F.SG.DAT firm.SG
         schon   viele.
         already many
         'Lots of cars have been repaired in this firm already.'

There are, however, sentences in which an actor argument and a non-finite verb that selects *haben* ("have") in the perfect occur in the fronted position, thus violating the principles stated for "ergative verbs" and the VP account (example from Dürscheid 1989: 123):

(24)   Kinder   gespielt   haben   hier noch nie.
         child.PL.NOM play.PSTP have.3PL.PRES here yet   never
         'It never happened here that children played.'

Furthermore, the number of elements that occur in the prefield with a non-finite verb is not generally restricted. The following constructions are grammatical (Dürscheid 1989):

(25) a.   Kinder   Fußball gespielt haben   hier noch nie.
           child.PL.NOM football play.PSTP have.3PL.PRES here yet   never
           'It never happened here that children played football.'

b. Dem   Hund   das   Wasser hingestellt
    DEF.M.SG.DAT dog.SG DEF.N.SG.ACC water   put-down.PSTP

    hat   er   gestern   schon.
    have.3SG.PRES   3M.SG.NOM   yesterday already

    'He put the water down for the dog yesterday already.'

Thus, do we have to assume that the number of constituents in the PrCS varies? And how many rules need to be posited? In any case, it should be noted that the examples given in this section are all highly marked and subject to focus structure restrictions.

In RRG, the notion of "VP" is not taken to be basic, as it is not found in all languages. Given that in German, there are examples of "non-ergative" subjects in the "VP", it seems appropriate to reformulate the rules independently of the notion of VP.

RRG assumes that the VP, if it exists in a language, is a grammaticalization of focus structure. Thus, it is not part of the layered structure of the clause. It is related to the constituent projection by a separate projection called "focus structure projection". The representation of constituent and focus structure reveals that in predicate focus constructions, the actual focus domain corresponds to the generative notion of VP (cf. Van Valin 2005: 77 ff.). This can also be shown for German, cf:

* **Lit.**: "What makes John today"; What does John do today?
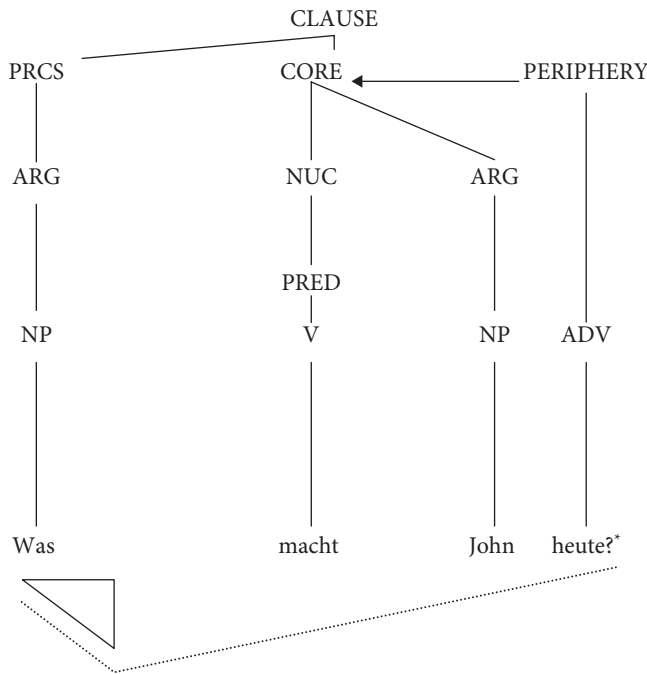
Figure 1. W-question with focus projection: Potential (dotted line) vs. Actual Focus Domain.
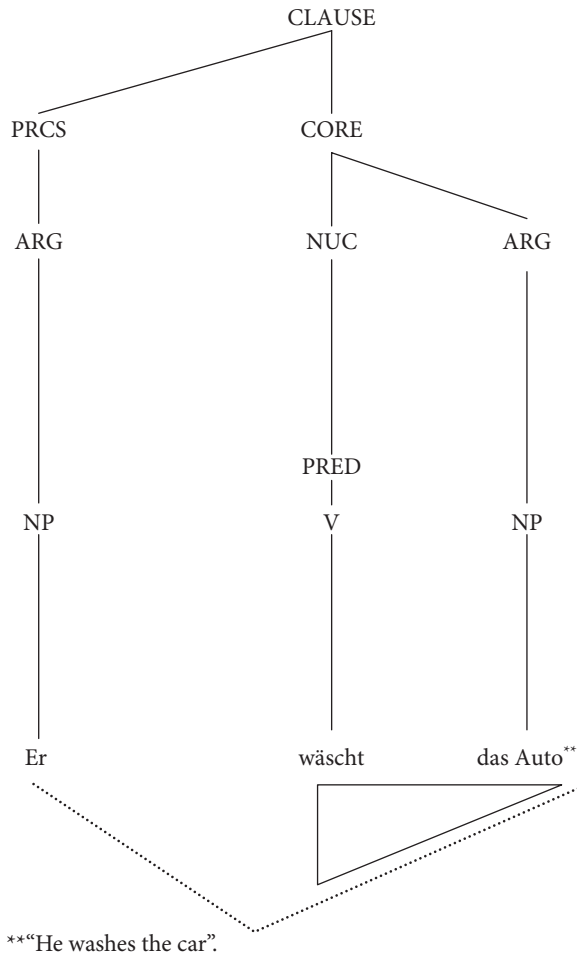
Figure 2. Main declarative clause with focus projection.

In English, syntactic constructions that are generally described by using notions such as "deletion" and "VP" can be explained by the interaction of the layered structure of the clause and focus structure. According to an RRG-approach, both conjunction reduction and "VP-ellipsis" are based on focus structure rather than on a syntactic concept called VP. There are two possibilities for the "VP" (for a detailed RRG-analysis of these constructions with English examples see Van Valin 2005: 228 ff.):

(i) The "VP" corresponds to the part of the sentence that is within the actual focus domain. In conjunction reduction, for example, a highly topical PSA is lexically unfilled, but can be recovered as being identical with the PSA from the previous logical structure. The (focussed) part of the sentence that is expressed, however,

corresponds to the notion of VP. This can also be shown for German (capitals indicate focus):

(26) John(i)   WÄSCHT   DAS   AUTO und *pro*(i)   PUTZT
John   wash.3SG.PRES def.N.SG.ACC car.SG   and   clean.3SG.PRES

DAS   FAHRRAD
DEF.N.SG.ACC   bike.SG

'John washes the car and cleans the bike.'

(ii) The "VP" corresponds to the part of the sentence that is outside the actual focus domain. In the construction often called "VP-ellipsis", for instance, a highly topical "VP" is missing in the second core, while the focussed part appears overtly:

(27) John   WÄSCHT   DAS   AUTO und JUDITH   auch
John   wash.3SG.PRES DEF.N.SG.ACC car.SG   and Judith   too.
'John washes the car and Judith does, too.'

Going back to nominal elements fronted with a non-finite nucleus, we observed that fronted elements + nucleus are most acceptable when the NP is undergoer (i.e., "direct object", "passive subject" in traditional terms, "ergative subject" in generative terms). But as (24) and (25a) show, actors can also be fronted, alone or with other fronted nominals. So, the notion of "VP" is not applicable here, and the combinations of fronted nominal elements cannot be explained, either.

According to a rule from generative grammar, the linear order of fronted ("topicalized") nominal elements has to reflect the possible serialization in the middlefield (Dürscheid 1989).

It seems that furthermore, this kind of fronting is only possible when all of the fronted elements (including the nucleus) are either within the actual focus domain or completely excluded from it. If one of the elements in the PrCS is focussed and the other one is not, the utterance is not acceptable (28a,29a). The elements in the PrCS have to be all focus (28b,29b) or all topic (28c,29c). The topical information can also be left out in the answer, which corresponds to the "VP-ellipsis". Note that in this case, the sentence lacks a PrCS/Vorfeld-position (28d,29d) (capitals for focussed elements):

(28) a.   Q: Hat er gestern das Fahrrad gewaschen?
         ('Did he wash the bike yesterday?')

      A: *Nein,   DAS   AUTO   gewaschen
      No,   DEF.N.SG.ACC car.SG   wash.PSTP

      hat   er   gestern.
      have.3SG.PRES 3M.SG.NOM   yesterday
      'No, it was the car that he washed yesterday.'

   b.   Er hat immer noch nicht die Blumen begossen,
       ('He still has not watered the flowers')

aber DAS   AUTO GEWASCHEN hat
but   DEF.N.SG.ACC car.SG wash.PSTP   have.3SG.PRES

er   gestern.
3M.SG.NOM   yesterday

('He still has not watered the flowers), but he did wash the car yesterday.'

c. Q: Hat er schon das Auto gewaschen?
       'Has he washed the car already?'

   A: Ja,   das   Auto   gewaschen hat   er
       yes,   DEF.N.SG.ACC car.SG wash.PSTP have.3SG.PRES 3M.SG.NOM

       gestern   schon.
       yesterday already

       'Yes, he washed the car yesterday already.'

d. Q: Wann willst du eigentlich das Auto waschen?
       'When are you planning to wash the car?'

   A: Habe   ich   gestern   schon.
       have.1SG.PRES 1SG.NOM   yesterday already
       'I did (that) yesterday already.'

(29) a. Q: Hat er gestern der Katze das Wasser hingestellt?
            ('Has he put down the water for the cat yesterday?')

       A: *Nein, DEM   HUND das   Wasser hingestellt
            no,   DEF.M.SG.DAT dog   DEF.N.SG.ACC water put-down.PSTP

            hat   er   gestern.
            have.3SG.PRES 3M.SG.NOM yesterday

            'No, he put the water down for the dog yesterday.'

   b. Er hat vergessen, die Blumen zu gießen,

       aber DEM   HUND   DAS   WASSER
       but   DEF.M.SG.DAT dog.SG DEF.N.SG.ACC water

       HINGESTELLT   hat   er
       put-down.PSTP have.3SG.PRES 3M.SG.NOM

       '(He forgot to water the flowers), but he did put the water down for the dog.'

   c. Q: Hat er schon dem Hund das Wasser hingestellt?
            'Has he put down the water for the dog already?'

       A: Ja,   dem   Hund   das   Wasser
            yes, DEF.M.SG.DAT dog.SG DEF.N.SG.ACC water

            hingestellt   hat   er   schon.
            put-down.PSTP have.3SG.PRES 3M.SG.NOM already

            'Yes, he put the water down for the dog already.'

    d.   Q: Stellst du bitte dem Hund das Wasser hin?
           'Will you please put the water down for the dog?'

        A: Habe   ich   schon.
           have.1SG.PRES 1SG.NOM   already
           'I did (that) already.'

The examples in (30a,b) can be both topic and focus, depending on the communicative context. (30c), however, which includes a deictic element, is less acceptable. I do not have an explanation for this, as deictic elements can also be in the domain of contrastive focus, as (30d) shows.

(30)   a.   Gebacken habe   ich   schon   gestern   Abend.
            bake.PSTP have.1SG.NOM 1SG.NOM already yesterday evening
            'I baked yesterday evening already.'

       b.   Kuchen gebacken habe   ich
            cake   bake.PSTP have.1SG.NOM 1SG.NOM

            schon   gestern   Abend.
            already yesterday evening

            'I baked cake yesterday evening already.'

       c.   ?Diesen   Kuchen gebacken habe   ich   schon
            DEM.M.SG.ACC cake   bake.PSTP have.1SG.NOM 1SG.NOM already

            gestern   Abend.
            yesterday evening

            'I baked this cake yesterday evening already.'

       d.   Ich habe noch kaum Vorbereitungen getroffen,

            nur DIESEN   KUCHEN GEBACKEN habe   ich
            only DEM.M.SG.ACC cake   bake.PSTP have.1SG.NOM 1SG.NOM

            schon   gestern   Abend.
            already yesterday evening

            'I have hardly prepared anything yet; I only baked this cake yesterday evening already.'

For the fronting of one or more NPs with the non-finite verb, the following extension of the existing rule set is in order:

(31)   Extension of the Linking rules for German:
       Semantics to Syntax (revised version of Van Valin & Diedrichsen 2006)

       5. a. 4.   If the nucleus is in the PrCS, one or more arguments from core and periphery may be placed before it, subject to focus structure restrictions (i.e., when the fronted elements (taken together) are in the actual focus domain or are all excluded from it). The word

order in the PrCS has to reflect the word order possibilities in the core, see 5.c) below.

b. d.n.a.

c. Remaining arguments are assigned to the core and periphery:

   1. General constraints:
       pronoun > other, NP > PP

   2. Case-based argument ordering constraint: NOM > DAT > ACC (default)

   3. If ACC = pronoun, then ACC > DAT (default)

These findings are supported by a recent study from Speyer (2007): He found that one of the main functions of the German prefield is to provide discourse coherence, as the most topical element has a strong tendency to appear in the leftmost position of the clause. However, according to Speyer's own acceptability judgements of a few sentences, the prefield position is pragmatically prespecified for scene-setting elements, brand new elements and contrastive elements. Only if none of those occurs in the prefield, the topic will move into this position. In the account presented here, the PrCS-position is not defined with respect to pragmatic prespecification. It is claimed that this position has to be filled with elements that belong to the same pragmatic domain, while the number of "constituents" is not generally restricted.

6.2   The "*tun*-periphrasis"

We have seen that the possibility of placing the nucleus in the precore slot is used when the nucleus (and, perhaps, other nominal elements) are in the actual focus domain or are all topic. Recall, however, that the nucleus can only be placed in the precore slot when it is non-finite. Thus, only sentences with periphrastic tense forms and modal-verb-constructions allow the precore slot position of the nucleus. In present tense, the nucleus is finite and fixed at the core-initial position (see (16) 5.a.1). In these cases, there is the possibility for speakers of German to use a "dummy auxiliary" (Dürscheid [3]2003) *tun* ("do"), which acts as the finite auxiliary (with hardly any semantics of its own), while the nucleus, carrying the main information, can be placed in the precore slot in non-finite form. With *tun* as auxiliary, the other possibilities in terms of placing nominal elements before the nucleus in the precore slot are given as well.

(32)   "*Tun*-periphrasis":

a. Waschen   tut   er   das   Auto   nie.
    wash.INF   do.3SG.PRES   3M.SG.NOM   DEF.N.SG.ACC   car.SG   never
    'He never washes the car.'

b. Das   Auto   waschen   tut   er   nie.
    DEF.N.SG.ACC   car.SG   wash.INF   do.3SG.PRES   3M.SG.NOM   never
    'Something that he never does is wash the car.'

    c.   Dem   Nachbarn   das   Auto waschen

         DEF.M.SG.DAT neighbour.M.SG.DAT DEF.N.SG.ACC car.SG wash.INF

         tut   er   nie.

         do.3SG.PRES 3M.SG.NOM never

         'Something that he never does is wash the car for the neighbour.'

This use of a dummy auxiliary is all consistent with the rule set presented above; no further rule is in order to specify this possibility, as it follows from the rule set already.

7. Conclusion

The RRG-based rule set for word order in German main declarative clauses can account for the so-called "VP-topicalization" that poses big problems for generative and traditional analyses, and it can account for the semi-standard "*tun*-periphrasis" as well.

Furthermore, such an analysis is suitable to account for the pragmatic conditions that lead to the formation of highly marked constructions like the ones discussed here. It has been shown that the assumption of a precore slot for German sentence topology is useful for an RRG-based description in various respects. It accounts for the relation between the operator projection and the constituent projection, in that the interpretation of modal verbs in terms of deontic (core operator) vs. epistemic (clausal operator) involves the Vorfeld-position in different ways. Furthermore, it accounts for the relation between constituent projection and focus structure: Certain constructions that involve a precore slot position of the nucleus can be explained in terms of focus structure rather than with respect to the notion of "constituent" or "VP". It seems that at least for the precore slot position, the demands of focus structure override the traditional notion of "constituent": According to the traditional rule, the number of constituents in the prefield is restricted to one. We have seen that there can be more than one constituent in the precore slot, but the elements placed in this position have to be "all focus" or "all topic"; a "mixture" of topic and focus elements in the precore slot is not possible.

Finally, the Vorfeld = precore slot account presented here makes a description of German word order rules in RRG-terms much easier and accounts for the basic principles of the theory more consequently than a non-PrCS-account. Given the strong restrictions on the placement of the finite verb in German main declarative clauses and the great variability of the placement of other constituents, a precore-slot-account is superior as it is suitable to describe the position of the finite verb independently of other word order peculiarities. In a precore-slot-analysis, the notion of core is fully integrated in the description of the possible placements of auxiliaries, be they finite or non-finite: They are placed before or after the core. In a non-precore-slot-analysis, however, the notion of core would not be very useful, as the auxiliaries would have to be placed between core elements.

So, for an RRG-based structural description of German word order, an account that equates the Vorfeld with the precore slot is highly adequate, as it makes full use of the basic concepts of the theory itself and it is even suitable to provide solutions to problems that have not been solved by other theories.

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Syntax, pragmatics and prosody

A prosodic projection for Role and Reference Grammar[*]

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The purpose of this chapter is to introduce a prosodic projection into the RRG inventory of grammatical representation. In particular this projection enables investigation of prosodic aspects of information structure (focus structure) within the RRG framework to proceed alongside existing investigation of syntactic and other means of expressing and representing information structure. The prosodic projection is based on the Autosegmental-Metrical/Tones and Break Indices (AM/ToBI) approach to the representation of intonation. The AM/ToBI representation is adapted into RRG through a redefining of prosodic structure in terms of concepts like prosodic "template" and prosodic "inventory", which already have a degree of familiarity within RRG through their syntactic counterparts.

1. Introduction

Role and Reference Grammar (RRG) is characterized by the representation of different components of grammatical structure via a series of projections, namely the constituent projection, the operator projection and the focus structure projection, which are supplemented by a semantic representation. These projections can be related to one another and can be associated with the semantic representation using linking rules which may be universal or language specific in character.

The purpose of the present chapter is to propose a "prosodic projection" through which the role of prosody within grammatical structure overall can be captured, especially its relationship with "information structure". In particular, the prosodic projection is closely aligned with the focus structure projection – an RRG representation of aspects of information structure. This close alignment follows from the fact that the main function of prosody in terms of the production and comprehension of clauses and sentences is to express certain information structural characteristics.

The chapter is organized as follows. Section 2 contains an overview of information structure and its representation within RRG. Section 3 includes a discussion of the "Autosegmental-Metrical/Tones and Break Indices" (AM/ToBI) framework for representing

prosodic information as well as the proposal for a prosodic projection for RRG to exist alongside other RRG projections. Finally there are some concluding remarks which include commentary on how the prosodic projection might interact with other RRG components.

2.   Information structure

Previous work on information structure in RRG, such as Van Valin & LaPolla (1997) and Van Valin (1999) among many others, is based on the approach adopted by Lambrecht (1994). This approach defines information structure as a pairing of "propositions as conceptual representations of states of affairs … with lexicogrammatical structures in accordance with the mental states of interlocutors who use and interpret these structures" (1994: 5). Within such lexicogrammatical structures Lambrecht identifies the formal manifestation of information structure "in aspects of prosody, in special grammatical markers, in the form of … syntactic constituents, in the position and ordering of such constituents, and in certain choices between related lexical items" (1994: 6). The relationship between information structure and syntax can be represented in RRG by means of principles which link the constituent projection and the focus structure projection, the latter being the RRG representation of information structure. As an addition to this linking, the role of "aspects of prosody" in the expression of information structure also requires a representation within RRG.

This section concentrates on the RRG approach to information structure in general, firstly presenting an overview of the approach described in Lambrecht (1994), and secondly outlining the RRG representation of this approach in the form of the focus structure projection. This sets the scene for dealing with the prosodic aspects of information structure in the following section.

2.1   Topic, focus and pragmatic structure

Lambrecht (1994) sets out an approach to information structure which is based on two abstract "pragmatic relations", topic and focus, and an associated "pragmatic structuring" of the propositions expressed by clauses and sentences.[1] For Lambrecht (1994: 7) "information structure … is not concerned with the organization of discourse, but with the organization of the sentence within a discourse". An aspect of sentence grammar which is paid particular attention is "the function of allosentences, i.e., of multiple structures expressing the same proposition". The differences between such allosentences may be lexical, syntactic or prosodic, and they arise from the interaction between the sentence and the context of the propositions they express. Examples (2) to (5) contain sets of allosentences from English, Italian, French and Japanese which

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1.   The term "information structure" dates back to Halliday (1967), and indeed Lambrecht (1994) draws on Halliday's work as well as that by the Prague School of linguistics (e.g., Daneš 1966); Jackendoff (1972); Chafe (1976, 1987); Prince (1981); Levinson (1983) and Gussenhoven (1984) among others.

correspond to the three contexts suggested by the statement and questions in (1). These contexts respectively represent narrow focus, predicate focus and sentence focus, where "focus" is a pragmatic relation informally corresponding to the new information expressed in a clause or sentence. The term "focus" is more formally defined later in this subsection. Accent placement is indicated in the examples by capitalization.

(1)   a.   I heard your motorbike broke down.
          b.   How is your car?
          c.   What happened?

(2)   a.   My CAR broke down.   (English)
          b.   My car/It broke DOWN.
          c.   My CAR broke down.

(3)   a.   Si è rotta la mia MACCHINA./È la mia   (Italian)
              REFL is broken DEF my   car   /is DEF my

              MACCHINA che è rotta.
              car   that is broken

          b.   (La mia macchina) si   è ROTTA.
              def my   car   REFL is broken

          c.   Mi si   è rotta (ROTTA) la   MACCHINA.
              PRN REFL is broken   DEF car

(4)   a.   C'est ma VOITURE qui est en panne.   (French)
              it.is my car   that is in breakdown

          b.   Ma voiture /Elle est en PANNE.
              my car   /it   is in breakdown

          c.   J'ai   ma VOITURE qui est en PANNE.
              I.have my car   that is in breakdown

(5)   a.   KURUMA ga   koshoo-shi-ta.   (Japanese)
              my.car   NOM break-do-PAST

          b.   (Kuruma wa) KOSHOO-shi-ta.
              my.car   TOP break-do-PAST

          c.   KURUMA ga   KOSHOO-shi-ta.
              my.car   NOM break-do-PAST

Although each sentence expresses the same proposition they do not have the same information structure; that is, they are distinct in terms of the "old" and "new" information, or presuppositions and assertion, which they express. In each of these contexts there is a contrast between the four languages in terms of their use of unmarked – i.e., "subject"-verb – vs. marked constituent order, and of unmarked – i.e., (near) final – vs. marked accent placement.[2]

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2. See Lambrecht (1994: 15–18) for justification of these assumptions regarding markedness of syntactic structure and accent placement.

In the narrow focus context, i.e., focus on an argument, as represented by context (1a), the English and Japanese sentences, (2a) and (5a), show marked (early) accent placement and unmarked constituent order. The first Italian equivalent in (3a), by contrast, has unmarked accent placement but marked (verb-"subject") constituent order. The bi-clausal clefted alternative in Italian and its French counterpart, (4a), on the other hand use this additional complexity to retain both unmarked constituent order as well as unmarked accent placement.

The context provided by (1b) is predicate focus, i.e., all but the "subject" is new information. In this case the examples from all four languages exhibit both unmarked constituent order and unmarked accent placement – see (2b), (3b), and so on. In the Japanese example, (5b), a morphological strategy (use of the "topic"-marker *wa*) is also available to indicate the non-focal material.

The third context, (1c), is sentence focus, a situation in which sentences contain only new information. Sentence focus in English, example (2c), involves the same pattern as narrow focus, namely unmarked constituent order combined with marked accent placement. The strategy exemplified for Italian in (3c) involves a marked constituent order together with unmarked accent placement. This is similar to (3a) except for the treatment of the possessive relationship between car and speaker. For French, sentence (4c), like (4a), illustrates an impetus towards maintaining both unmarked constituent order and unmarked accent placement. Similarly to the Italian examples, the exact construction used in French to express sentence focus varies from that used in the narrow focus context. Finally, example (5c) demonstrates unmarked constituent order and unmarked accent placement.[3]

In summary, examples (2) to (5) indicate a range of strategies that languages may resort to in order to express information structure. In particular, accent placement can be seen to have an important part to play.

The use of grammatical structures to express such contextual variation is formalized by Lambrecht (1994) in terms of the "pragmatic relations", focus and topic, which are identified through the "pragmatic structuring" of a proposition such that old information is represented as a "pragmatic presupposition" and new information as a "pragmatic assertion". These terms are defined and illustrated in what follows.

Firstly, presupposition and assertion have the respective definitions given in (6) and (7), taken from Lambrecht (1994: 52).

(6)   Pragmatic Presupposition: The set of propositions lexicogrammatically evoked in a sentence which the speaker assumes the hearer already knows or is ready to take for granted at the time the sentence is uttered.

(7)   Pragmatic Assertion: The proposition expressed by a sentence which the hearer is expected to know or take for granted as a result of hearing the sentence uttered.

---

3.   The accent placement in (5c) is considered unmarked despite the presence of an additional accent early in the sentence. When there is more than one accent present in an intonational phrase (the prosodic constituent corresponding to the whole sentence in this example – see section 3 for more details) it is usual practice to consider the rightmost accent as the sentence accent.

Secondly, the pragmatic relations, topic and focus, are defined as components of the propositions associated with the presupposition and assertion as in (8).

(8) a. Topic: A referent is interpreted as the topic of a proposition if in a given situation the proposition is construed as being about this referent, i.e., as expressing information which is relevant to and which increases the addressee's knowledge of this referent.

   b. Focus: The semantic component of a pragmatically structured proposition whereby the assertion differs from the presupposition.

(Lambrecht 1994: 131, 213)

Thirdly, the pragmatic relations are related to concrete grammatical structures via information structure which is "[t]hat component of sentence grammar in which propositions as conceptual representations of states of affairs are paired with lexico-grammatical structures" (1994: 5). In other words, the pragmatic relations, topic and focus, which exist at the level of the proposition(s), correspond to the actual linguistic entities, topic expression and focus domain, which are in turn defined as in (9).

(9) a. Topic Expression: A constituent is a topic expression if the proposition expressed by the clause with which it is associated is pragmatically construed as being about the referent of this constituent.

   b. Focus Domain: The syntactic domain in a sentence which expresses the focus component of the pragmatically structured proposition.

(Lambrecht 1994: 131, 214)

Given the definitions in (6)–(9) Lambrecht goes on to formally represent the information structure for the sets of allosentences in examples (2)–(5). The three contexts represented here correspond to three types of focus which were touched upon in the discussion earlier in this subsection. Firstly there is a distinction between narrow and broad focus, according to whether the focus domain contains a single syntactic constituent or more than one such constituent. Secondly there is a distinction within broad focus between predicate focus, in which the focus domain contains all but the topic, and sentence focus, in which the whole sentence constitutes the focus domain. Pragmatic structuring of each proposition yields a particular focus domain as illustrated in (10) to (12).

   Lambrecht (1994) proposes a pragmatic structuring of propositions which is illustrated in examples (10)–(12) respectively for the narrow focus, predicate focus and sentence focus contexts represented in (1a–c).

(10) Context: I heard your motorcycle broke down.
     Sentence: My CAR broke down.
     Presupposition: 'speaker's x broke down'
     Assertion: 'x = car'
     Focus: 'car'
     Focus domain: NP [narrow focus]

(11) Context: What happened to your car?
     Sentence: It/My car broke DOWN.
     Presupposition: 'speaker's car is a topic for comment x'

Assertion:	'x = broke down'	
Focus:	'broke down'	
Focus domain:	VP (or verb + remaining post verbal core constituents in RRG terms) [predicate focus]	

(12)   Context: —
       Sentence: My CAR broke down.
       Presupposition: —
       Assertion: 'speaker's car broke down'
       Focus: 'speaker's car broke down'
       Focus domain: S[sentence focus]

This pragmatic structuring of propositions and its relationship to the clauses and sentences through which it is expressed is translated into RRG in terms of the focus structure projection as detailed in the next subsection.

2.2   The focus structure projection

Within the focus structure projection of RRG, it is the focus domain that is represented. This is achieved by means of demarcating a potential focus domain, the PFD – e.g., for English this is the whole clause; for other languages there may be restrictions as to which part of the clause may potentially constitute the focus. Furthermore, there is an additional demarcation of where the actual focus domain, AFD, occurs with respect to the PFD. It is the AFD which corresponds to the "focus domain" which results from the pragmatic structuring in (10) to (12). This is illustrated in (15) and (16) below for the predicate focus and narrow focus contexts in examples (13) and (14), taken from Van Valin & LaPolla (1997: 215, 216).

(13)   John presented a girl with some flowers.

(14)   John gave them to her.

(15)

(16)

```
        SENTENCE
           |
        CLAUSE
           |
         CORE
        ⟋   ↑  ⟍
   ARG  NUC  ARG  ARG
    |    |    |    |
        PRED
    |    |    |    |
    NP   V   NP   PP
    |    |    |    |
  John gave them to her
    |    |    |    |
   ARG  NUC  ARG  ARG
      ⟍ ⋅⋅⋅  ⟋     ⟋
        SPEECH ACT
```
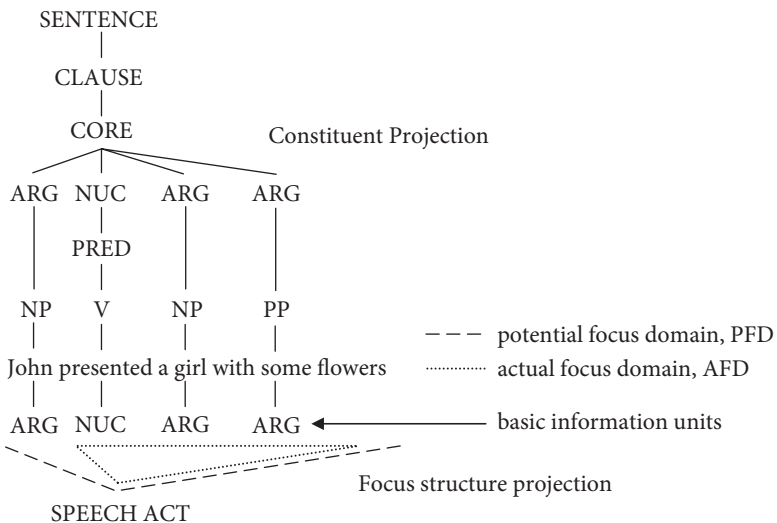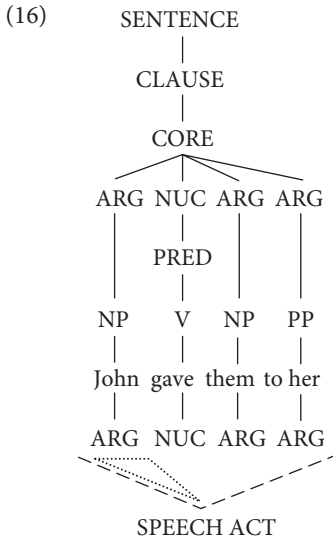
These examples show a correspondence between the constituent projection and the focus structure projection reflecting syntactic expression of information structure. By analogy, given that information structure is also expressed by prosodic means, a correspondence must also exist between the focus structure projection and prosody. Section 3 concentrates on how this prosodic expression of information structure might be incorporated into the RRG view of grammar.

3.   The prosodic projection

This section is concerned principally with the role of prosody, especially intonation, in the expression of information structure and with the representation of this role in terms of a prosodic projection. As the discussion of examples (2) to (5) suggests, intonation plays an important role in the interpretation of grammatical structures. Although the prosodic projection proposed below is developed on the basis of English, the general principles are suggested to be applicable to languages that may use different aspects of prosody, or may use the same aspects differently to English, in terms of expressing information structure. The section proceeds as follows: firstly the Autosegmental-Metrical/Tones and Break Indices (AM/ToBI) approach to intonation (Pierrehumbert 1980; Ladd 1996 and contributions to Jun 2005) is discussed; secondly, on the basis of the AM/ToBI framework a prosodic projection is proposed.

3.1   The AM/ToBI framework

The AM/ToBI framework is based on the concept of representing different types of information as separate, parallel but interrelated dimensions or tiers. The work of Pierrehumbert (1980), from which the ToBI system of transcribing intonation has been

developed, was itself based upon the "autosegmental" representation of tone in African languages in work such as Goldsmith (1976), among others. Although this approach developed originally to describe the intonation of English, work is well underway in extending it to a number of other languages – cf. contributions to Jun (2005).

An autosegmental phonological representation is one in which different properties of words such as tones, phonemes or syllables are represented as segments on separate tiers. Pierrehumbert (1980) adopts these features into her analysis of English intonation allowing an intonational contour to be decomposed into a sequence of H(igh) and L(ow) tones – a sample ToBI transcription is included in the appendix. This decomposition is shown schematically in example (17) in which the same contour is associated with utterances of different lengths spoken in the same context, which in this case is a strongly challenging or contradicting echo question.

(17)   A: I hear Sue's taking a course to become a driving instructor.

a.   B: Sue!?
            H L H

b.   B: A driving instructor!?
            H L   H
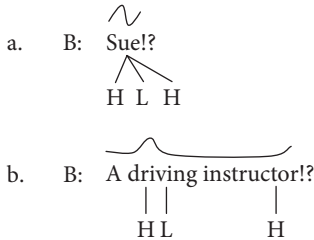
(adapted from Ladd 1996: 44)

This contour appears as a continuous pitch movement on B's utterance of the monosyllable, *Sue*, in (17a), but as a sequence of two separate pitch events when associated with the longer text, *driving instructor*, in (17b). The first part of the sequence consists of a pitch rise on the initial syllable of *driving* together with the fall associated with the immediately following syllable. The second part is a rise at the end of *instructor*. The level sections of the contour – that preceding the first rise and that between the fall and the second rise – are merely transitions which lead up to these localised pitch events. In the case of (17a) the two events occur on a single syllable so there is no "space" for transitions. Ladd (1996: 45) sums this up as follows:

> … [T]he AM [Autosegmental-Metrical] theory … draw[s] an explicit distinction between *events* and *transitions*. It recognises that some parts of contours are linguistically important, and others are merely what happen between the important parts. Furthermore, it assumes that the important parts are localised "events", not long stretches of contour.

It is such "linguistically important" parts of intonation contours that play a role in terms of the information structure of an utterance, a role which, as proposed below, can be mediated within RRG by means of a prosodic projection.

There are two types of pitch event in example (17). One type is associated with prominent syllables and is exemplified by the rise and fall beginning on the first syllable of *driving*. An event of this type is referred to within the AM/ToBI approach as a "pitch accent", a term which Ladd (1996: 45–46) defines as:

> … a local feature of a pitch contour – usually but not invariably a *pitch change*, and often involving a local maximum or minimum – which signals that the syllable with which it is associated is *prominent* in the utterance.

"Prominence" here has two related interpretations. Firstly, a word may have a prominent role in terms of the information structure of an utterance. Secondly, such a role may be indicated in terms of the prominent phonetic characteristics of the word's stressed syllable.[4]

An intonational contour does not consist of pitch accents alone, however. In addition there are two types of boundary tone which are associated with the right edges of two types of prosodic constituent. These constituents, the intermediate and intonational phrases, form part of the hierarchical metrical structure of an utterance which is illustrated in (19) below for example (18).[5]

(18)   I'm simply trying to get you to understand.

(19)   intonational phrase

prosodic word / "clitic": I'm   simply trying to get you to understand.

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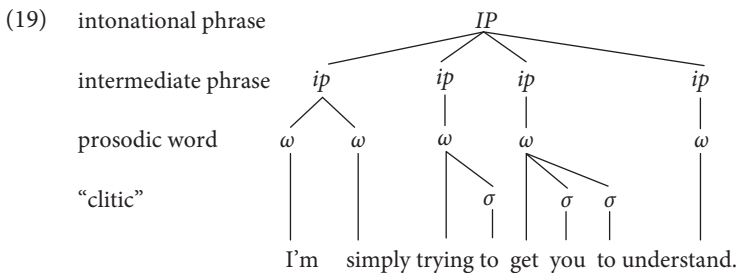
4.   Stress and prominence are not the same thing. Stress is a phonological ability or potential to bear prominence, while prominence itself is a real physical or phonetic characteristic realised on some stressed syllables. Hence, not all stressed syllables are phonetically prominent, as is the case with the second syllable of *instructor* in example (17b) which carries no pitch accent, unlike the first syllable of *driving*.

5.   Metrical structure is represented within the ToBI framework on the separate "break indices" tier. In particular, the relative strength of juncture between different words is indicated by means of numerical indices. See appendix for an example ToBI transcription. In addition, the sentence in example (18) is spoken with a degree of emphasis reflected in its division into four intermediate phrases. A recording and transcription of this utterance are available via http://www.ling.ohio-state.edu/~tobi/ame_tobi/ as "understand.wav" and "understand.TextGrid" respectively.

The right edge of an intonational phrase, *IP*, carries an "intonation phrase boundary tone" – in English either L% or H% – while the right edge of an intermediate phrase, *ip*, is marked with an "intermediate phrase boundary tone" – for example L⁻ or H⁻.[6] The latter are often alternatively referred to as "phrase accents".

The ToBI framework as currently applied to (mainstream) American English (MAE_ToBI), described in Beckman et al. (2005), is summarised in table 1.

Table 1. The tones of (mainstream) American English

Pitch accents	Intermediate phrase boundary tones	Intonational phrase boundary tones
L*	L⁻	L%
H* (!H*)	H⁻ (!H⁻)	H%
L + H* (L + !H*)		%H
L* + H (L*+!H)		
H + !H*		
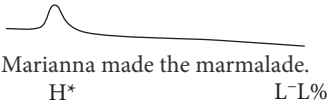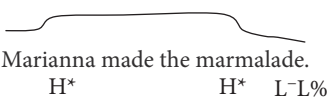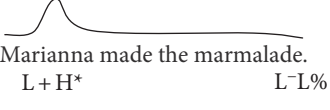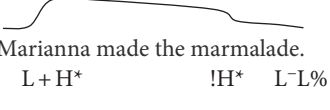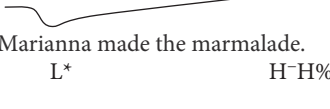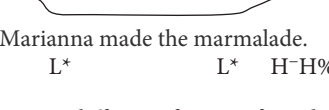
An intonation contour can thus be analysed as consisting of a relatively small number of discrete pitch events associated with particular syllables and prosodic boundaries. In the ToBI notation the nuclei of syllables which bear pitch accents are aligned with "starred" tones, either L* or H*.[7] The association of pitch accents and boundary tones is demonstrated in example (20).

(20)
$$
\begin{array}{cccc}
\text{L*} & \text{H}^{-} & \text{L*} & \text{H}^{-}\text{H\%} \\
| \quad | & & | & | \; | \\
\end{array}
$$
[[Marianna]*ip* [made the marmalade]*ip*]*IP*?

Furthermore, the same sentence uttered in different circumstances can vary with respect to both the type and number of pitch accents that it contains. This variation is illustrated in example (21) in which the impressionistic contours are based on the description in Beckman & Ayers (1997: 10) of several different productions of the sentence *Marianna made the marmalade*.

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6. An additional *IP* boundary tone is listed in table 1 – namely %H. This is referred to by Beckman et al. (2005) as "marginal, [occurring] at the beginnings of some intonational phrases after [a] pause".

7. These starred tones may be preceded by a leading tone or followed by a trailing tone which are as much a part of the pitch accent as the starred tone itself. Hence pitch accents may be tonally simplex or complex.

(21) a.

Marianna made the marmalade.
  H*   L⁻L%

b.

Marianna made the marmalade.
  H*   H*   L⁻L%

c.

Marianna made the marmalade.
  L + H*   L⁻L%

d.

Marianna made the marmalade.
  L + H*   !H*   L⁻L%

e.

Marianna made the marmalade.
  L*   H⁻H%

f.

Marianna made the marmalade.
  L*   L*   H⁻H%

Although there are different forms of pitch accent, as (21) demonstrates, in the description of the prosodic projection later in this section it is only the placement of pitch accents, rather than their exact form, that is of direct concern. Other important aspects of the AM/ToBI framework to be utilised in the prosodic projection are the distinction drawn between pitch events and transitions from one such event to another, and the consequent characterisation of intonational contours in terms of a small number of tonal targets.

3.2   The prosodic projection and prosodic templates

On the one hand, the proposed prosodic projection is based on the aforementioned AM/ToBI description of the intonational phenomena of English. On the other hand, representation within the prosodic projection is not intended to be restricted only to languages with intonation comparable to that of English, and is hence to be viewed as compatible both with intonational phenomena cross-linguistically, and with those other aspects of prosody in general which languages may adopt for information structure purposes. Accordingly, the following factor is considered to be at work in the

background to this discussion – in matters of tune-text association (that is, the association of tones with respect to the prominent syllables in a sentence or clause) the prosodic structures of languages are divergent. Consequently, the prosodic projection is couched in terms that are intended to be specific enough to accurately reflect English intonation as it has been described in the AM/ToBI framework, while remaining general enough to leave open the incorporation of the differences that have been attested among the prosodic systems of the world's languages. At this stage, the extension of this work to other languages and/or prosodic systems is a matter for future research.

This subsection develops the prosodic projection as an adaptation in RRG terms of AM/ToBI principles for the representation of the intonation of English. These principles are expressed in terms of generalized prosodic templates (intended to be analogous to "syntactic templates") as in example (22) for an intonational phrase tune, TUNE_{IP}, and example (23) for an intermediate phrase tune, tune$_{IP}$.[8]

(22)

$$\text{TUNE}_{IP}$$

$$\text{tune}_{ip} \quad (\text{tune}_{ip}) \quad \ldots \quad \ldots \quad \text{t\%}$$

(23)

$$\text{tune}_{ip}$$

$$\text{t}^\star \quad (\text{t}^\star) \quad \ldots \quad \ldots \quad \text{t}^-$$
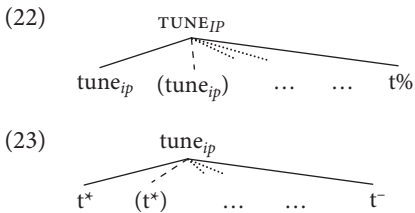
The prosodic categories, TUNE_{IP} and tune$_{ip}$, denote the stretches of the intonational contour respectively contained within the intonational phrase (*IP*) and intermediate phrase (*ip*), while t*, t$^-$ and t% in turn represent unspecified pitch accents, phrase accents and *IP* boundary tones. The "intonational phrase tune template", or "*IP*-tune template", in (22) therefore states that an intonational contour consists of an *IP* boundary tone, t%, which marks its right edge, along with at least one "intermediate phrase tune", or "*ip*-tune". The latter constituent is constructed, according to the template in (23), from a minimum of one pitch accent, t*, together with a phrase accent, t$^-$, associated with its right edge. The use of "t" in these contexts denotes an unspecified tone which, in specific contours, can be instantiated by a simplex tone, e.g., L% or H% in the case of t%; or by a more complex sequence of tone targets, e.g., $\text{L}^\star + \text{H}$, $\text{L} + \text{H}^\star$ or other bitonal pitch accent in the case of t*.

The prosodic projection has two components which are illustrated in example (24) which is a representation of example (20) above: (i) a string of tones and its hierarchical organisation according to the prosodic templates detailed in (22) and (23) – i.e., everything

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8.   In proposing structures of the type given in (22) and (23) I have drawn on the work of Ladd (1996) who has developed an Autosegmental-Metrical approach to the abstract representation of intonational contours based on X' theory. Some aspects of this have been adopted into these prosodic templates. However, Ladd's representations take the form of a binary branching structure while prosodic templates have a "flatter" structure.

above the dashed line in (24); and (ii) a labeled bracketing which represents the metrical structure of the utterance, or its division into prosodic constituents or phrases.

(24)

$$\text{TUNE}_{IP}$$

tune$_{ip}$ tune$_{ip}$

L*   H⁻   L*   H⁻ H%

[[MARIANNA]$_{ip}$ [made the MARMALADE]$_{ip}$]$_{IP}$

(25)

$$\text{TUNE}_{IP}$$

tune$_{ip}$

t*   t⁻ t%

[[my car broke DOWN]$_{ip}$]$_{IP}$

(26)

$$\text{TUNE}_{IP}$$

tune$_{ip}$

t*   t⁻ t%

[[my CAR broke down]$_{ip}$]$_{IP}$
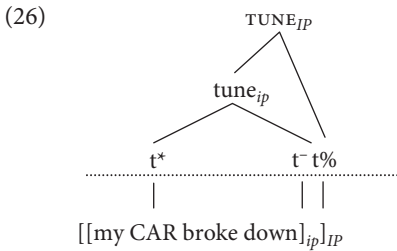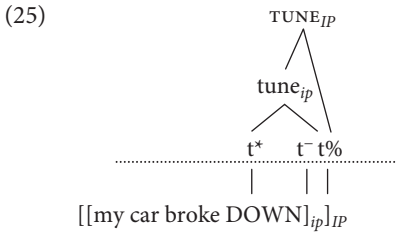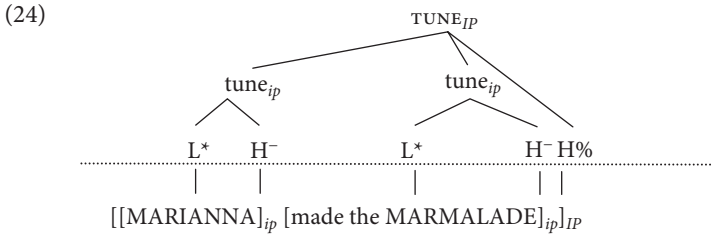
The prosodic projections in (25) and (26) indicate the application of the prosodic templates to the pair of allosentences corresponding respectively to example (2b), i.e., predicate focus, and examples (2a,c), i.e., narrow focus and sentence focus. Here the actual values of the tones are unspecified unlike example (24) which is based on a true transcription – see appendix. While a likely tonal sequence is H*L⁻L% in both cases, it is the different tune-text association in (25) that distinguishes predicate focus from the other two contexts. In addition, the fact that in this case narrow focus and sentence focus cannot be distinguished prosodically is captured by (26).

4.   The relationship between the prosodic projection and the focus structure projection

The prosodic projection can be collapsed together with the focus structure projection to form a single representation giving an impression of how focus structure and

prosody interact. This is illustrated in examples (27) and (28) below for examples (13) and (14), repeated for convenience, which contain predicate focus and narrow focus constructions respectively.

(13)   John presented a girl with some flowers.

(14)   John gave them to her.

(27)

(28)
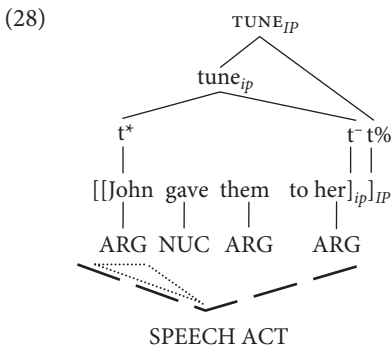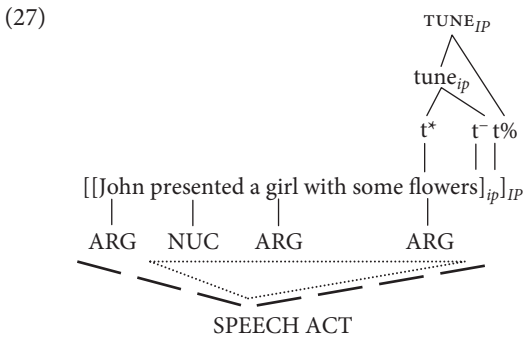
Informally it is possible to state some linking principles. For instance the prosodic focus, as marked by the sentence accent – i.e., the rightmost pitch accent within the intonational phrase – is associated with an element of the actual focus domain within the focus structure projection. Following from this, is the fact that any accented element outside of the AFD cannot be focused but may instead be considered as a topic expression which for independent reasons has been accented or otherwise prosodically marked.[9]

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9.   One such independent reason may lie in an aspect of information structure dealt with in Lambrecht (1994) but which has not been touched upon in this chapter, namely the "pragmatic state" that a speaker assumes a referent to have in the mind of the addressee. A referent may be presumed to be "identifiable" or "unidentifiable":

> [A]n identifiable referent is one for which a shared representation already exists in the speaker's and the hearer's mind at the time of utterance, while an unidentifiable

The relationship between the prosodic projection and the focus structure projection also provides a basis for investigation into language-specific principles concerned with linking different types of focus structure with particular types of prosodic expression. For instance, on the basis of the examples in (29), a first approximation of a principle for accent placement in English predicate focus might be stated as in (30).

(29)   A: What happened to your car?
    a.   B: It broke DOWN.
    b.   B: It broke down on the MOTORWAY.
    c.   B: It got hit by a LORRY.
    d.   B: Someone stole the WHEELS.

(30)   ACCENT PLACEMENT IN ENGLISH PREDICATE FOCUS (first approximation):
       The rightmost element in the AFD carries the sentence accent.

Using the prosodic projection, further investigation would reveal the extent to which this statement of unmarked accent placement can be applied to a range of predicate focus contexts.

Broadening such work even further will permit the investigation of and the representation of such issues as are discussed above with regard to examples (2) to (5) vis à vis their unmarked vs. marked constituent order and accent placement, thereby furthering understanding of the intersections between syntax, prosody and information structure.

5.   Conclusion

The prosodic projection which has been introduced here is based on an already established phonological framework (AM/ToBI) for the representation of intonation. AM/ToBI allows superficially complex intonational structures to be stated in terms of a relatively small inventory of constituent parts. By adapting this type of representation, intonation has been cast in terms such as "prosodic template" and "prosodic inventory" that are reminiscent of syntactic constituent structure. As such the prosodic projection easily allows prosodic

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referent is one for which a representation exists only in the speaker's mind. (Lambrecht 1994: 77–78)

Identifiable referents are further classified according to one of three 'activation states':

An ACTIVE [referent] is one 'that is currently lit up…in a person's focus of consciousness at a particular moment.' An ACCESSIBLE/SEMI-ACTIVE [referent] is one 'that is in a person's peripheral consciousness…of which a person has a background awareness, but one that is not being directly focused on.' An INACTIVE [referent] is one 'that is currently in a person's long-term memory, neither focally nor peripherally active.'   (Lambrecht 1994: 93–94, following Chafe 1987)

A topic expression, therefore, may by marked by means of intonation if the speaker assumes its referent to be, for example, 'unidentifiable' or 'inactive' in the mind of the speaker.

information to be accommodated alongside other aspects of grammar within the wider RRG framework. In particular, the three-way relationship between prosodic, syntactic and information structure is a potentially rich area for further investigation. This is not only the case for English and languages with similar prosodic inventories. In addition, the format of prosodic templates is sufficiently adaptable to permit cross-linguistic differences among prosodic inventories to be incorporated into the prosodic projection.

Appendix – example ToBI transcription

The ToBI transcription system factors out three types of information on to separate tiers. In addition to an orthographic tier there are tone (*To-*) and break index (*-BI*) tiers, with the latter incorporating the metrical structure of the utterance into the overall autosegmental representation. In a full ToBI transcription break indices 3 and 4 coincide respectively with phrase accents and *IP* boundary tones. Since an intonational phrase boundary also coincides with the right edge of an intermediate phrase, this boundary is therefore marked by a sequence consisting of a phrase accent followed by an *IP* boundary tone. This is the case at the right edge of the example below. Break indices 1 and 0, by contrast, are not aligned with specific tonal targets. The latter index corresponds to boundaries between full words and reduced function words. Break index 1, on the other hand, marks the boundary between adjacent phonologically independent words which don't otherwise occur at the boundaries between the larger prosodic units, *ip* and *IP*. Finally, break index 2 is reserved for two types of mismatch – either a) when a phrase accent or *IP* boundary tone occurs where an *ip/IP* boundary is not expected; or b) where such a boundary is detected in the absence of the usual associated phrase accent or *IP* boundary tone. These are illustrated for the utterance used in examples (20) and (24) which are repeated below for convenience.[10]

(20)

$$L^* \quad H^- \qquad\qquad L^* \qquad H^-H\%$$

$[[\text{Marianna}]_{ip} \, [\text{made the marmalade}]_{ip}]_{IP}?$

(24)

$$\text{TUNE}_{IP}$$

$\text{tune}_{ip} \qquad\qquad \text{tune}_{ip}$

$$L^* \quad H^- \qquad\qquad L^* \qquad H^- \, H\%$$

$[[\text{MARIANNA}]_{ip} \, [\text{made the MARMALADE}]_{ip}]_{IP}$

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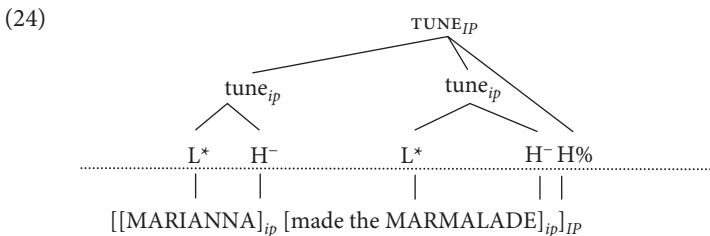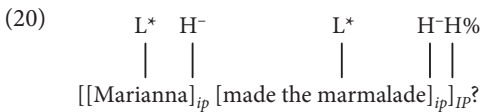
10.   A recording is available from: http://www.ling.ohio-state.edu/~tobi/ame_tobi/ as "made4.wav"/ "made4.TextGrid".

	marianna	made	the	marmalade
	L*	H⁻		L*	H⁻H%

Time (s)
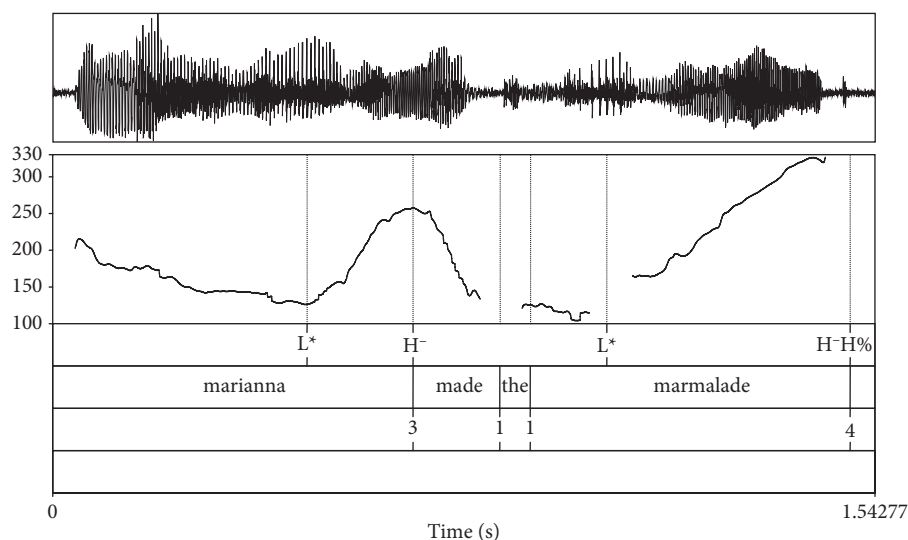
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Is Role and Reference Grammar an adequate grammatical theory for punctuation?

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In this paper, I show that Role and Reference Grammar can be developed into a syntactic theory encompassing both oral and writing language systems. To achieve this goal, I present in §2 some premises from a linguistic theory of writing systems. In §3–4 I review the correspondence rules between phonological-syntactic and written linguistic units in simple (§3) and complex (§4) structures in Spanish, according to the official orthography. At the end (§5), I draw some conclusions and present some perspectives for future research.

1. Introduction

In one of her recent talks, Beatrice Primus (2005; cf. now Bredel & Primus 2007: 119–122) complained about the absence of any syntactic theory capable of correctly explaining the mapping between oral and writing language system in the realm of suprasegmental, syntactic motivated phenomena.[1] In this paper, I will try to show that Role and Reference Grammar (hereafter RRG, Van Valin 2005) has such a potential that it can be easily developed into a syntactic theory encompassing both oral and writing language systems.[2] I don't contend RRG to be better suited than any other syntactic theory, and therefore I will not compare it to other theories. To achieve my goals, I will present in §2 some premises from a linguistic theory of writing systems (mainly drawn from Dürscheid 2006[3] and Neef 2005). In §3–4 I will review the correspondence rules between phonological-syntactic and written linguistic units in simple (§3) and complex (§4) structures in Spanish, according to the official orthography (RAE 1999). At the end (§5), I will draw some conclusions and present some perspectives for future research.

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1.   Following the distinction between *sentence marks* and *auxiliary marks* (cf. Dürscheid 2006[3]: 152–153; Bredel & Primus 2007: 104–107), I will only investigate some sentence marks here (period/full stop, comma, question marks and exclamation points).

2.   Cf. Nunberg 1990 for another approach to our subject (Dan Everett, p.c.).

2.   Premises

In what follows, I adhere to a view of writing system linguistics as presented by Neef (2005):

> Ich schätze Schriftsysteme als originäre Gegenstände linguistischer Forschung ein (im Einklang mit der Autonomiehypothese), wobei ich Schriftsysteme als sekundäre Zeichensysteme ansehe, die immer einem Sprachsystem nachgeordnet sind (im Einklang mit der Dependenzhypothese). Andererseits halte ich derivationelle Ableitbarkeitsmodelle, die dem Ideal folgen, Schreibungen seien vollständig aus unabhängig motiviertem Wissen zum Sprachsystem herleitbar, für prinzipiell dem Gegenstand unangemessen. Letztlich bewerte ich damit […] die Dichotomie von Autonomie und Dependenz als ungeeignet dafür, einen verbindlichen Rahmen für die Konzeption theoretischer Modelle der Schriftsystemanalyse abzustecken. Vielmehr besteht die primäre Aufgabe der Schriftlinguistik darin zu modellieren, wie schriftliche Formen es ermöglichen, den Gehalt sprachsystematischer Formen rekodierbar zu machen. (Neef 2005: 7–8; *Rekodierungsmodell*; cf. Dürscheid 2006³: 35–42, 128–130)³

Neef differentiates two modules of linguistic knowledge and, therefore, two subdisciplines of linguistics of writing systems:

> Eine adäquate Modellierung schriftsystematischen Wissens sollte demnach in der Lage sein, zwischen unmöglichen, möglichen und tatsächlichen Schreibungen eines Worts zu unterscheiden. Dabei untersucht die Graphematik, welches mögliche Schreibungen für eine bestimmte Lautung sind (womit dann zugleich alle andere Schreibungen als graphematisch unmögliche Schreibungen für die fragliche Lautung ausgewiesen sind), während die Orthographie die Frage behandelt, welches die richtige Schreibung für ein bestimmtes Wort ist, welches seinerseits über eine bestimmte Lautung verfügt. Die Graphematik definiert folglich einen Lösungsraum möglicher Schreibungen für Lautungen, die als Wort fungieren. Dieser Lösungsraum kann möglicherweise genau ein Element umfassen, zweifelsohne aber auch eine größere Menge von Schreibungen. (Neef 2005: 11–12)⁴

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3.   "I consider writing systems as original objects of linguistic research (according to the autonomy hypothesis). They are secondary sign systems that are subordinated to an [oral] language system (according to the dependency hypothesis). On the other hand, I think of derivability models, which postulate that writing forms are completely derivable from independently motivated knowledge, as inadequate for the object [of study]. In the end, I evaluate the dichotomy of autonomy and dependence as inappropriate to define an authoritative frame for theoretical models of writing system analysis. The primary goal of linguistics of writing is to model how written forms allow to recode the content of [oral] language system forms." (My translation)

4.   "An adequate modeling of writing system knowledge must be able to differentiate between the impossible, possible and real writing forms of a word. Graphematics investigates what the

What Neef presents here as modules and disciplines concerning segmental phenomena, can easily be extended to modules and disciplines encompassing also suprasegmental phenomena, by replacing in the quoted text the word *Wort* ("word") through the word *Einheit* ("unit"). The leading principle of graphematics is according to Neef the recoding principle:

> (1) Recoding principle of a graphematics of phonographic writing systems (Neef 2005: 16):
> Eine graphematische Form muss die Rekodierbarkeit der korrespondierenden phonologischen Form gewährleisten.[5]

3. Simple structures

RRG's view of non relational syntactic structure separates a constituent projection, based on the principles of "dependency, constituency and topology" (Bellosta von Colbe 2003), from an operator projection, based on the principles of modification and scope.

3.1 The constituent projection

In sentences, it is important to distinguish between the universal, semantically based (unmarked) and the language-particular, pragmatically based (marked) aspect of the constituent projection (cf. for the next two paragraphs Bellosta von Colbe 2003: 39–44, and for modifications Van Valin 2005: 3–8).

The first aspect of the constituent projection is structured through two semantic contrasts on the syntagmatic axis based on the principle of dependency, the first one between predicating elements (defining the *nucleus*, NUC) and dependent non predicating elements and the second one in the realm of non predicating elements between arguments depending on the nucleus (realized as *syntactic arguments*, ARG, or as *syntactic argument-adjuncts*, AAJ) and non arguments (realized as *adjuncts*, ADJ). The nucleus and its dependent syntactic arguments or non arguments (*nuclear periphery*) constitute the *core*; the core and its dependent non arguments (*core periphery*) constitute the *clause*, the clause and its dependent non arguments (*clausal periphery*) constitute the *sentence* (cf. Bellosta von Colbe & François 2002: 2–5).

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possible written form of a sound form is (identifying all the other writing forms as impossible), whereas orthography answers the question, what the right written form for a given word is, which also has a concrete sound form. So, graphematics defines a range of solutions of possible written forms for sound forms that function as words. This range of solutions may contain one and only one element, but beyond doubt also a larger set of written forms." (My translation)

5. "A graphematic form must guarantee the possibility to recode the corresponding phonologic form." (My translation)

The second aspect of the constituent projection is structured through two pragmatic contrasts on the syntagmatic axis based on the principle of linearity/relative position. There can be two *extra-core slots* (ECS), one to the left (*pre-core slot*, PrCS) and another to the right (*post-core slot*, PoCS) of the core; the core together with the core periphery and the extra-core slots constitute the clause. On the next level, there can be two kinds of *detached positions* (DP), one to the left (*left detached position*, LDP) and one to the right (*right detached positions*, RDP) of the clause; the clause with the clausal periphery and the detached positions constitute the sentence. Because crossing branches are allowed, there is no obstacle to postulating an *intraclausal detached position* (IDP; cf. (2bv–viii)), which the theory urgently needs, to cope with parenthetical syntactic units (cf. infra).
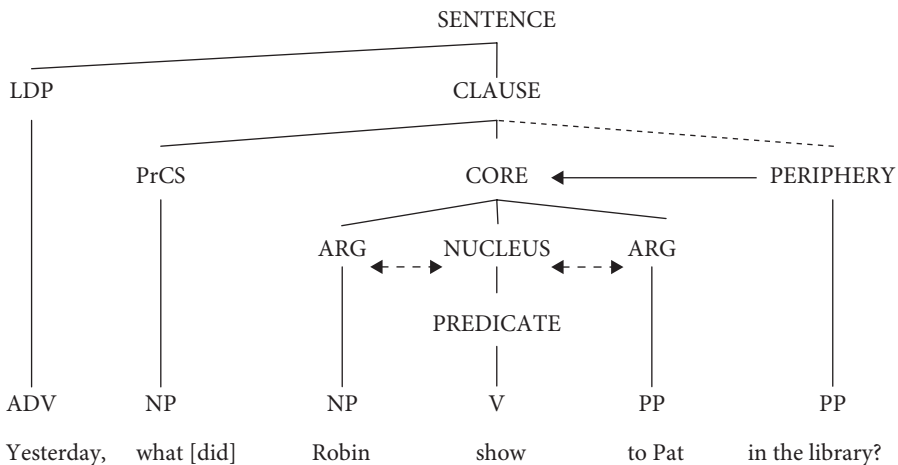
Figure 1. Layered structure of the clause (LSC; Van Valin & LaPolla 1997: 36; cf. Van Valin 2001: 89–92; 2005: 7) with modifications (dotted lines). Branches represent constituency relations; arrows, dependency relations.

According to this view of simple sentences, we can formulate a first set of rules for (simple) sentences:

(2) Set of rules for (simple) sentences in the realm of the constituent projection:

    a. A *period/full stop* (.) is a one value text punctuation mark (cf. Dürscheid 2006[3]: 153–154; RAE 1999: §5.1.3), which encodes the right/end boundary of a syntactic sentence (cf. *Ganzsatz*, Dürscheid 2006[3]), which should coincide with the right boundary of a phonological utterance (U), phonologically encoded by a boundary tone (%) (cf. RAE 1999: §5.1).

    i. *La mañana era espléndida.*   RAE 1999: 57
       'It was a splendid morning.'[6]

  b. A *comma* (**,**) is a two value sentence punctuation mark (*zweistelliges Graphem*, Primus 1993: 246), which encodes the boundary between detached positions (cf. *Herausstellung*, Primus 1993: 250–255; Bredel & Primus 2007: 93–100) and the clause in a simple sentence, phonologically encoded by an H*H% edge tone (*tonema continuativo*; Sosa 1999: 125–126; but cf. Martín Butragueño 2005) at the end of the corresponding intonation phrase (I) (cf. RAE 1999: §§ 5.2.4, 5.2.5c, 5.2.6b, 5.2.8).

    i.   LDP: *Julio, ven acá.*   RAE 1999: 59
        'Julio, come here.'

    ii. LDP: *No obstante, es necesario reformar el estatuto.*   RAE 1999: 62
        'However, it is necessary to reform the statute.'

    iii. LDP: *Efectivamente, tienes razón.*   RAE 1999: 62
        'Indeed, you are right.'

    iv. LDP: *En cuanto al dinero, ya no le queda.*   cf. RAE 1999: 61
        'As far as the money goes, (s)he has nothing left.'

    v.   IDP: *Estoy alegre, Isabel, por el regalo.*   RAE 1999: 60
        'I am happy, Isabel, with the gift.'

    vi. IDP: *Nos proporcionó, después de tantos disgustos,*   RAE 1999: 60
        una gran alegría.
        '(S)he gave us, after so many dissatisfactions,
        a great joy.'

    vii. IDP: *Tales incidentes, sin embargo, no se repitieron.*   RAE 1999: 62
        'Such incidents, nevertheless, were not repeated.'

    viii. IDP: [*Éstos*] *están causados, generalmente,*   cf. RAE 1999: 62
        por errores humanos.
        [These] are caused, generally, by human errors.'

    ix. RDP: *He dicho que me escuchéis, muchachos.*   RAE 1999: 59
        'I have told you to listen to me, boys.'

A general remark on pauses is in need here. Pauses are set voluntarily or involuntarily somewhere in the speech flow according to linguistic, paralinguistic or extralinguistic criteria and may therefore signal syntactic boundaries, but doesn't have to. This is why Intonational Phonology dispenses with pauses and employs intonational events instead (Sosa 1999: 30–33; cf. Bredel & Primus 2007: 94–95). Nonetheless, their status as reliable clues for the syntax-pragmatics interface is still far from being established (Sosa 1999: 35–47).

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6. The English translation of the examples of RAE is taken or adapted from RAE/Adarve.

Concerning the comma, some remarks are called for. As Primus (1993: 247) points out, there is no (syntactic-semantic) dependency relation between the units bound by the commas, as can be seen in figure 1. This is a very important criterion for a generalized comma rule to be developed later on.

An unproblematic assumption is that vocatives (2bi, iv, ix), connectors (2bii, vii) and sentential clausal adverbials (*effectivamente*, *generalmente*; 2biii, viii) always fill in a detached position. An important issue to be addressed concerns the syntactic-phonological and graphematic distinction between detached positions and extra-core slots (2biv). The RAE (1999: §5.2.6) guide offers misleading criteria to distinguish between syntactic units in LDPs and in PrCS. According to them, paraphrasing the sentence by using the "topic marker" *en cuanto a* identifies the unit as belonging to the LDP; paraphrasing the sentence by using the "cleft construction" *es lo que* identifies the unit as belonging to the PrCS (RAE 1999: 60–61). In the example (3a), the bare NP *dinero* must not be paraphrased by the NP *el dinero*; therefore, the paraphrase offered by RAE is wrong. As a result, in both examples (3) the "topic marker paraphrase" is ungrammatical. Moreover, the "cleft construction paraphrase" is grammatical in both examples.

(3)   Distinction between left detached positions and pre-core slots according to RAE (1999: 60–61):

    a.   *Dinero, ya no le queda.* > *En cuanto al dinero, ya no le queda* > *Dinero es lo que ya no le queda.* > ?*En cuanto a dinero, ya no le queda.*
        'As far as money goes, he has nothing left.'

    b.   *Vergüenza debería darte.* > *Vergüenza es lo que debería darte.* > *En cuanto a vergüenza, debería darte.*
        'You should be ashamed.' > 'Ashamed is what you should be.'

In my view, leaving aside vocatives (2bi, v, ix) connectors (2bii, vii) and sentential clausal adverbials (2biii, viii), a four way distinction must be drawn between the syntactic units that can fill LDPs and PrCS according to the interaction between the intonation, semantics, pragmatics and syntax they display (cf. for the following the discussion in Bellosta von Colbe 2001: 61–68). From an *intonational point of view*, the elements in the LDP (and, as an extension, in any detached position) "are set off from the clause by a pause" (Van Valin 2005: 6; cf. Bredel & Primus 2007: 94–95), in other words, by an H*H% edge tone. From a *semantic point of view*, "[w]hen the element in a detached position functions as a semantic argument of the verb, there is normally a resumptive pronoun in the core referring to it" (Van Valin 2005: 6). In Spanish, it should be at least a "semantic clamp", that is, some weak frame-semantic relationship between the meaning expressed by the phrase in the LDP and the meaning of an element of the clause or the whole clause itself. From a *pragmatic point of view*, this means that the phrase in the LDP functions as a topic expression with respect to the clause (cf. Van Valin 2005: 6–7, 68–69; Van Valin & LaPolla 1997: 202–205). These are necessary

conditions to identify LDPs, but they are not sufficient, because they are also shared by some types of PrCS in Spanish. In other words, any fronted element that is not set off by the mentioned edge tone, that does not have a "semantic clamp" or that is not a topic expression belongs to the PrCS, but there are also elements belonging to the PrCS that are set off by the edge tone, that have a "semantic clamp" or that are topic expressions. As a consequence, we must look for disambiguating properties.

The following set of properties (4), taken from Zubizarreta (1999: 4221–4222), can be established as complementary conditions to distinguish syntactic units in PrCS from those in LDPs. As far as simple sentences are concerned, we can observe that it is more probable for units to lose their syntactic bounds with the predicate, the farther they are placed from it both in terms of constituency and of linearity:

(4)   Coding properties distinguishing syntactic units in PrCS in (simple) sentences (Zubizarreta 1999: 4221–4222):

    a.   Syntactic units in the PrCS must display case markers, if the language has them.

    b.   Syntactic units in the core functioning as a part of the "semantic clamp" can only be anaphoric clitic pronouns, if the language has them.

        i.   ***A** sus amigos$_i$ María los$_i$ invitó a cenar*.
           'Her friends, Mary invited them to dinner.'
        ii.   *****De María**$_i$ Pedro siempre habla mal de ella$_i$*.
           Lit. 'Mary, Peter always puts her down.'
        iii.   *****A María**$_i$ Pedro le$_i$ habla por teléfono a esa idiota$_i$ todos los días*.
           Lit. 'Mary, Peter calls that idiot every day.'

These are necessary conditions to identify PrCS, but they are not sufficient, because they are also shared by some LDPs in Spanish. In other words, any fronted element that does not display case markers or whose corresponding unit in the core is not an anaphoric clitic pronoun belongs to the LDP, but there are also elements belonging to the LDP that do display case markers or whose corresponding units in the core are anaphoric clitic pronouns.

But when we take into account complex sentences (cf. §4), we can arrive at a further disambiguating behavioural property. The definition of LDP and PrCS implies that subordinate clauses don't have LDPs (5b) of their own (Van Valin 2005: 193) but only PrCS (5c–d), because LDPs are extra-clausal syntactic units. Nonetheless, subordinate clauses can "use" the LDP of the whole sentence (5e).

(5)   Behavioural property to distinguish syntactic units in PrCS in complex sentences (Zubizarreta 1999: 4221–4222):
    Fronted syntactic units in subordinate clauses always constitute a PrCS.
    a.   *(En cuanto a) Bernardo$_p$ nadie confía en ese idiota$_i$*
        'Concerning Bernardo, I'm sure that nobody trusts in that idiot.'

b.   *Estoy segura de que, Bernardo_i, nadie confía en ese idiota_i.

c.   *Estoy segura de que **a** sus amigos_i María los_i invitó a cenar.*
     'I'm sure that Mary invited her friends to dinner.'

d.   *Estoy segura de que vergüenza debería darte.*
     'I'm sure that you should be ashamed.'

e.   *Bernardo_i, estoy segura de que nadie confía en ese idiota_i.*

Example (3b) can, thus, be easily accounted for as belonging to the PrCS. First, no edge tone is supposed to separate the unit *vergüenza* from the rest (but cf. Martín Butragueño 2005 for counterexamples). Second, there is no "semantic clamp" between the mentioned unit and a unit in the core. Third, the mentioned unit cannot be considered a topic expression. Finally, it is possible to embed the clause as it is in a complex sentence (5d). However, example (3a) is a little bit more difficult to cope with:

(6)   Tests to distinguish syntactic units in PrCS in (simple) sentences as applied to (3a)

a.   Intonation test: *Dinero* [H*H% (?)](,) *ya no le queda.*   ?
b.   "Clamp" test: *Dinero_i(,) ya no le* [? Ø_i] *queda.*   PrCS
c.   Topic test: Paraphrase: ?*(En cuanto a) dinero*, *ya no le queda.*   ?
d.   Marker test: Paraphrase: (*Del*) *dinero_i(,) ya no le queda* (*nada*).   PrCS
e.   Clitic test: No clitic in the language   ?
f.   Embedding test: *Estoy segura de que(,) dinero(,) ya no le queda.*   PrCS

First, an edge tone can (but must not) separate the unit *dinero* from the rest (6a). Second, there is no "semantic clamp" between the mentioned unit and a unit in the core (6b). But, third, the mentioned unit must be considered a topic expression (6c). Fourth, a "genitive" case marker can be found to paraphrase the sentence (6d). Fifth, there is no clitic in Spanish to test the corresponding criterion (6e). Finally, it is possible to embed the clause as it is in a complex sentence (6f). Although three criteria are inconclusive, the other three seems to offer evidence to the unit being in the PrCS. Thus, we conclude (against RAE 1999) that no comma should be set between the unit *dinero* and the rest of the sentence.

According to this, a four way pragmatic distinction should be made between the possible units preceding the core:

(7)   Distinctions between syntactic units filling pre-core slots and positions
      (Bellosta von Colbe 2001: 61–68):

a.   Free topic: *(En cuanto a) Bernardo_i, estoy segura de que nadie confía*
                       en ese idiota_i.   (5a)
b.   Pre-core topic: *A sus amigos_i María los_i invitó a cenar.*   (4bi)
c.   Pre-core focus: Vᴇʀɢüᴇɴᴢᴀ *debería darte*   (3b)
d.   Partitive topic: *Dinero ya no le queda.*   (3a)

These distinctions can also be summarized in a table like the following:

Table 1. Overview of LDP, PrCS and core initial position in Spanish (based on Bellosta von Colbe 2001: 68, 144)

Syntax/Semantics				Pragmatics	Intonation	
Slot	Slot content	Relationship to the clause/core	Relation markers	Relation	Accent	Edge tone
Left detached position	Free topic	Frame-semantic relation to a unit in the clause ("semantic clamp")	No/any marker Clause unit	Topic	Neutral	H*+H%
Pre-core slot	Partitive topic	Dependency from the predicate (No "semantic clamp")	No marker No unit	Topic	–/Neutral	–/H*+H%
	Pre-core topic	Dependency from the predicate Coreference with a unit in the core	Case marker Clitic	Topic	–/Neutral	–/H*+H%
	Pre-core focus	Dependency from the predicate (No "semantic clamp")	Case marker No unit	Focus	Contrastive	–/H*+H%
Core initial position	Core topic	Dependency from the predicate (No "semantic clamp")	? ?	Topic?	–/Neutral	–/H*+H%

A partitive topic must be considered as a special case of pre-core topic that displays characteristics of its own (6) due to its peculiar syntax and semantics. The core initial position presented in the table can be considered as a grammaticalized topic position; this property can lead the writer to set a comma, when an edge tone could be inserted due to extralinguistic needs (as breathe taking after certain amount of speaking time). This is presumably the reason why RAE (1999: 63) strongly forbids setting a comma between the "subject" (in core initial position) and the verb of a sentence (§5.2.12; on the problem of the slot/position of the "subject" in French and German, cf. Bellosta von Colbe 2003 for different solutions):

(8)   *Las estanterías del rincón, estaban perfectamente organizadas.*   RAE 1999: 63
       'The bookcases of the corner, were perfectly organized.'

3.2   The operator projection

RRG assumes the existence of a set of *operators*, i.e., of grammatical categories bearing basic semantic-pragmatic information about the relationship between the sender (speaker/writer) and the message sent. These operators are hierarchically and topologically ordered according to the constituent(s) they modify and take scope over. Thus, *nuclear operators* include aspect, negation and motion directionals; *core operators* include participant directionals, event quantification, modality and internal negation; *clausal operators* include status and tense; *sentential clausal operators* include evidentials

and illocutionary force (Van Valin 2005: 9). Interestingly enough, Van Valin (2005: 9) states that "evidentials and illocutionary force are modifiers of the sentence or utterance as a whole, rather than one of its constituent clauses; they are thus "sentential" in nature". Nevertheless, they are classified as clausal operators. Two remarks are in point here: First, an utterance must not be a sentence in the sense of RRG, so utterances not displaying a full layered structure must be allowed to be modified by a clausal operator. Second, sentential clausal operators may only take scope over the main/root clause of a sentence, although the whole sentence may be "affected" in some way by the operator (Van Valin 2005: 9). This is the case in the following Spanish examples, where the illocutionary force operator takes only scope over the clause, leaving the LDP aside; the sentences must nevertheless be classified as interrogative/"exclamative" as a whole:

(9)   a.   *Con respecto al impacto ambiental, ¿se ha previsto algún tipo*   RAE 1999: 71
           de medidas para que su efecto sea el menor posible?
           'Concerning the environemental impact, did someone make
           some sort of arrangements in order to minimize the effect?'

      b.   *Pepe, ¡cuánto me alegro de que hayas venido!*   RAE 1999: 71
           'Pepe, how happy I am that you came!'

This type of example leads us to the conclusion that such an "interrogative/exclamative test" may be of use for the determination of the LDP (10a–c):

(10)   A further behavioural property to distinguish syntactic units in LDPs in (simple) sentences:

       LDPs must be excluded from the scope of interrogative/'exclamative' illocutionary force operators (Translations in (4) and (5)).

       a.   *$¿$(En cuanto a) Bernardo$_i$, nadie confía en ese idiota$_i$?*
       b.   *(En cuanto a) Bernardo$_i$, ¿nadie/alguien/quién confía en ese idiota$_i$?*
       c.   *Bernardo$_i$, ¿(quién) está segura de que nadie confía en ese idiota$_i$?*
       d.   *¿A sus amigos$_i$ María los$_i$ invitó a cenar?*
       e.   *A sus amigos$_i$, ¿quién/María los$_i$ invitó a cenar?*
       f.   *A sus amigos$_i$ ¿(quién) está segura de que María los$_i$ invitó a cenar?*

Moreover, the test shows that pre-core topic expressions can be located in the LDP, a fact that has fostered confusion (10e–f).

(11)   Set of rules for (simple) sentences in the realm of the operator projection:

       a.   The *question marks* (¿?) are one value sentence punctuation marks, which encode respectively the left/beginning and the right/end boundary of a syntactic (simple) clause or sentence/intonation phrase (I) with the interrogative illocutionary force marker that consists in an interrogative contour (cf. RAE 1999: §5.6; Sosa 1999: 143–156; 212–228).

            i.   Yes-no question: *¿Comisteis ayer en casa?*   RAE 1999: 70
                 'Did you have lunch at home yesterday?'
            ii. Wh-question: *¿Dónde has comprado ese traje?*   RAE 1999: 70
                 'Where did you buy this suit?'

    b.   The *exclamation points* (*¡!*) are one value sentence punctuation marks, which encode respectively the left/beginning and the right/end boundary of a syntactic (simple) clause or sentence/intonation phrase (I) having an 'emotional intonation' (cf. RAE 1999: §§ 5.6; Sosa 1999: 163–170).

        i.   *¡Eso es una injusticia!*   RAE 1999: 70
            'That's unfair!'

        ii. *¡Qué magnífica pintura!*   RAE 1999: 70
            'What a wonderful painting!'

Some remarks are required here. First, question marks and exclamation points are "sentence mood indicators" and not "speech act indicators" (Primus 1997: 472; cf. Dürscheid 2006[3]: 153–154). This does not pose any problem for RRG because illocutionary force operators are not "speech act indicators" either. Second, an "emotional intonation" can (but needs not to) point out to some kind of "exclamatory" illocutionary force, uncovering expressive (speaker-related) or appellative (hearer-related) types of illocutionary force (cf. Jakobson/Halle 2002[2]). Third, the Academy (RAE 1999: §5.6.3) suggests quite correctly that interrogative and "exclamative" illocutionary force operators would take scope also over the right detached position (RDP), leading to a remarkable asymmetry to the LDP:

(12)   Illocutionary force operators and the RDP:

    a.   *¿Has decidido qué vas a hacer, Sonia?*   RAE 1999: 71
        'Did you decide what you'll do, Sonja?'

    b.   *¡Cuánto me alegro de que hayas venido, Pepe!*   RAE 1999: 71
        'How happy I am that you came, Pepe!'

    c.   *¿María los$_i$ invitó a cenar, a sus amigos$_i$?*   cf. (4)

Syntactic units placed in the RDP are encliticized Is (Gussenhoven 2004: 290–292), but get always the corresponding intonation of the preceding clause (tone copy, Gussenhoven 2004: 315–316). This seems to confirm Van Valin's (2005: 9) idea cited above, that "evidentials and illocutionary force are modifiers of the sentence or utterance as a whole, rather than one of its constituent clauses; they are thus "sentential" in nature".

4.   Complex structures

Complex structures (phrases or sentences) encompass two or more simple or complex structures. In RRG (cf. for this paragraph Van Valin 2005: 183–205), this complexity can be described along two dimensions: nature of the structures involved and relationship between the structures involved. The nature and/or level of the structures involved determines the *juncture* type (nuclear, core, clausal, sentential) and the relationship between the structures involved define the *nexus* type (coordination, cosubordination, subordination). *Coordination* involves two or more independent structures; *cosubordination* involves at least one structure depending on another in the realm of

the operator projection according to the principles of modification and scope; *subordination* involves at least one structure depending on another in the realm of the constituent projection according to the principles of dependency, constituency and topology. Thus, if the subordinated structure is a syntactic argument of the matrix structure, we have *argument subordination*; if it is a syntactic adjunct of the matrix structure, we have *adjunct subordination* or *ad-subordination*.

A first step towards a set of punctuation rules for Spanish complex structures in RRG will consist in the provisional assumption of the comma rule for German, formulated by Beatrice Primus from a generative perspective:

(13)   The comma rule for German (Primus 1993: 246; cf. Bredel & Primus 2007: 91–102)[7]
Ein Komma zwischen einem einfachen oder komplexen Ausdruck A und einem einfachen oder komplexen Ausdruck B ist regulär g[enau] d[ann] w[enn]
(a) und (b) oder (a) und (c) gelten:

   a.   Es gibt einen Satzknoten der A und B dominiert.
   b.   Zwischen A und B interveniert eine syntaktische oder semantische Satzgrenze.
   c.   A und B sind koordiniert, und die Koordination ist nicht durch eine echte koordinierende Konjunktion gekennzeichnet.

We leave aside the comma as a gap mark for ellipsis (RAE 1999: §5.2.9; cf. Bredel & Primus 2007: 92) in simple and complex sentences and take A and B to be simple or complex structures belonging to any level of the constituent projection of a phrase or sentence (nucleus, core, periphery, clause/phrase, sentence). For Spanish, the necessary condition (13a) (cf. Bredel & Primus 2007: 91, 110) refers in RRG not only to the sentence node above the clause node in the constituent projection but also to the NP node and to any periphery node. This accounts for the comma rule in simple sentences: There is only one place for a comma to be set, namely between a detached position and the clause. This accounts also for the absence of commas in simple NPs and in any juncture type below the phrasal or clausal level (cf. the concepts of "Satzwertigkeit"/*"clauselikedness"* and "Integration"/*integration* in Primus 1993: 246, 256).

(14)   No commas inside the clause:

   a.   Nuclear juncture: *María lo hizo limpiar por Pedro*
Cosubordination; Paris 1999: 44, 54
'Mary obliged Peter to clean it.'

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7.   "A comma between a simple or complex expression A and a simple or complex expression B is regular iff a and b or a and c are valid:

   a.   There is a sentence node that dominates A and B.
   b.   There is a syntactic or semantic sentence boundary between A and B.
   c.   A and B are coordinated and coordination is not marked by a proper coordinating conjunction." (My translation)

b. Core juncture: *Juan lo hizo a Pedro peinarse*
    Coordination; Paris 1999: 55, 60
    'John obliged Peter to comb his hair.'

Condition (13b) involving subordination (cf. Bredel & Primus 2007: 100–102, 111–113) must be reformulated for Spanish, because only sentential and NP subordination must be separated from the matrix structure by a comma:

(15) Condition (13b) reformulated for Spanish (cf. Van Valin 2005: 192–193, 221):
      Sentential and NP subordinations must be separated from the matrix structure by (a) comma/commas.

a. Symmetrical sentential subordination: direct discourse complements
    *La verdad, escribe un político, se ha de sustentar con razones y
    autoridades.*   RAE 1999: 60
    'The truth, writes a politician, has to be sustained by reasons and authorities.'

b. Symmetrical sentential subordination: Fronting of peripheral adverbial
    clauses (LDP)
    En cuanto a Bernardo$_i$, si nadie confía en ese idiota$_i$, el negocio se irá a pique.
    'Concerning Bernardo, if no one trusts in this idiot, the company will
    collapse.'

c. Asymmetrical sentential NP subordination: Non restrictive relative clause
    *Los vientos del Sur, que en aquellas abrasadas regiones son muy frecuentes,
    incomodan a los viajeros.*   RAE 1999: 60
    'The winds of the South, that are very frequent in those hot regions, causes
    discomfort to the travelers.'

d. Symmetrical NP subordination: Non restrictive appositive XPs
    En ese momento Adrián, el marido de mi hermana, dijo que nos ayudaría.
                                                       RAE 1999: 60
    'At that moment, Adrián, my sister's husband, said that he would help us.'

Fronted peripheral adverbial ad-clausal subordinations are often located in the LDP and follow the rule for simple sentences (Van Valin 2005: 194–195; no rule in RAE 1999):

(16) Symmetrical ad-clausal subordinations: Fronting of peripheral adverbial
      clauses (LDP)
      Aunque la mona se vista de seda, mona se queda.   Spanish proverb
      Lit. 'Even though the monkey wears silk clothes, it remains a monkey.'

The condition (13c) involving coordination (cf. Bredel & Primus 2007: 91–93, 110–111) indicates that coordination inside the sentence or the NP must be signaled (either) by a comma or by a proper coordinating conjunction. According to Primus (1993: 246–247) there are two problems: How must the disjunction in the rule be characterized? What is a "proper coordinating conjunction"? Although the disjunction should be characterized as exclusive (*either … or*; cf. RAE 1999: §§ 5.2.1, 5.2.2), German as well as Spanish orthography allows the setting of comma and conjunction in some (counterintuitive) cases (inclusive disjunction).

(16)   Setting of a comma and a proper coordinating conjunction in Spanish (RAE 1999:
§§ 5.2.2., 5.2.3; cf. Primus 1993: 248–249 for a similar problem in German):

a.   As a diacritic mark, to avoid a possible level confusion between successive
identical conjunctions relating phrase level and sentence level elements:
[*Pagó* [*el traje, el bolso y los zapatos*]], [*y salió de la tienda*].   RAE 1999: 59
'She paid for the dress, the purse and the shoes, and left the store.'

b.   As a complexity mark:

i.   Semantic complexity: There is a semantic contrast between the clause
introduced by the conjunction and the rest of the sentence:
[*Pintaron las paredes de la habitación, cambiaron la disposición de los
muebles*], [*y quedaron encantados*].   RAE 1999: 59
'They painted the walls of the rooms, they changed the disposition of
the furniture, and they were enchanted.'

ii.   Formal complexity: The overall sentence is very long:
[*Los instrumentos de precisión comenzaron a perder su exactitud a
causa de la tormenta*], [*y resultaron inútiles al poco tiempo*].
                                                                    RAE 1999: 59
'The instruments began to lose their precision because of the storm,
and were useless soon after.'

"Proper coordinating conjunctions" are those that stand outside, to the left of any co-
ordinated structures they introduce; they can be used recursively (Primus 1993: 248,
248 fn2). This is only the case for the Spanish conjunctions *y/e*, *ni*, and *o/u* (cf. RAE
1999: §§5.2.1, 5.2.2).

(17)   Coordinating conjunctions in Spanish (cf. RAE 1999):
a.   Proper:
*Y se marchó y a su barco lo llamó 'Libertad' y en el cielo descubrió gaviotas y
pintó estelas en el mar* (José Luis Perales, 'Un velero llamado 'Libertad'')
'And she left, and she called her boat 'Freedom', and in the sky she dis-
covered gulls, and painted wakes in the sea.' (Translation at http: //www.
nobbysplace.com)

b.   Other (RAE 1999: § 5.2.7):
i.   Adversative:
*Puedes llevarte mi cámara de fotos, **pero** ten mucho cuidado.*
                                                                    RAE 1999: 61
'You can take my camera, but be very careful.'
ii.   Consecutive-illative:
*Prometiste acompañarle, **conque** ya puedes ir poniéndote el abrigo.*
                                                                    RAE 1999: 61

'You promised to go with him; so you can already start wearing your coat'.

iii. Explicative-illative:
*Están en casa, **pues** tienen la luz encendida.*   RAE 1999: 61
'They are at home, because they have the light on.'

Interestingly, we could get away with exception (16bi), if we consider that the coordinating conjunction is not used "properly", but gets an adversative meaning as a result of a conversational implicature.

5. Conclusion

In this paper, I have rearranged the main punctuation rules of Spanish and tried to "translate" them into the "language" of RRG, showing that these punctuation rules are mainly based on syntactic criteria, as postulated in Primus (2005, cf. Bredel & Primus 2007) and that RRG is an adequate theory to describe them. Some conclusions and perspectives can be drawn both for the normative system of punctuation rules and for RRG. First, the norms of punctuation could be stated in a more simple and systematic way, especially the comma norms for clause and sentence subordination should be rewritten in a more detailed and principled way. Second, RRG is in need of more investigation in many respects:

- It could be useful to postulate an intraclausal detached position to account for parenthetical syntactic units.
- It is necessary to find a typologically sound set of criteria to distinguish the core initial position from the pragmatically based constituents of the sentence (extracore slots and detached positions).
- It is necessary to develop a few theoretical devices to cope with those aspects of suprasegmental phonology that are relevant to non-relational structure.
- It could be useful to refine the distinction between ad-clausal and sentential subordinations, when appearing in the LDP.

In this paper, I have concentrated on the rules for some sentence punctuation graphemes (period/full stop, comma, question marks and exclamation points). There are others that can be considered context dependent allographs of the main punctuation graphemes (colon, semicolon, dash, and parenthesis). These groups do not need further syntactic principles for the description of their use (cf. Bredel & Primus 2007: 114–117 for textual principles). The alleged allography relations inside the punctuation system could be an interesting subject of a further paper.

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The interplay of focus structure and syntax[*]

Evidence from two sister languages

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I examine Italian and Sicilian main-clause word order drawing upon Van Valin (1993, 1999, 2005) and Van Valin & LaPolla (1997). Van Valin's (1999) hypothesis on the typology of the interplay of focus structure and syntax is corroborated by micro-parametric variation. Although Italian is subject to a syntactic constraint and a pragmatic constraint on the canonical position of the subject, it proves to be rigid pragmatically and relatively flexible syntactically. Contrastingly, Sicilian turns out to be flexible in both ways. As a result of its pragmatic flexibility, Sicilian does not exhibit a topicalization strategy which is found in Italian and involves the association of a syntactic position with a specific pragmatic role. The analysis of the space which is outside the core of the clause indicates that the positions which define the potential focus domain of a language need not be adjacent.

1. Introduction

This paper examines the micro-parametric variation between Italian and Sicilian main-clause word order adhering to Van Valin's (1993, 1999, 2005) and Van Valin & LaPolla's (1997) approach to the study of word order in natural languages. Van Valin's (1999) view of the interplay of focus structure and syntax, which is formulated on the basis of the findings of typological research, proves to be a valid hypothesis in the light of evidence from the said closely-related languages. Word-order patterns result from the tension of syntactic and pragmatic parameters which may be ranked differently across languages, for instance in the sister languages taken into consideration in this context. Interestingly,

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there appear to be more general, semantic, restrictions which have a bearing on word order and hold true for both Italian and Sicilian, as well as many other languages (Bossong 1980; Levin & Rappaport Hovav 1995; Van Valin 1993). Two claims are made with respect to the RRG theory of the interplay of focus structure and syntax: (i) the positions in the layered structure of the clause which define the potential focus domain of a language need not be contiguous; (ii) syntactic positions which are defined in semantic terms (e.g., periphery) may be associated with a specific pragmatic role, in accordance with the pragmatic parameters of word order which are at work in the language under study.

2.   Grammatical relations and pragmatic roles

My working hypothesis in this paper draws upon Van Valin (1999), who identifies four types of interaction between, on the one hand, syntax, and, on the other, focus structure (terminology from Lambrecht 1994), i.e., the grammatical encoding of the domain of the assertion or focus, in contrast with the topical or presupposed part of the utterance. Van Valin's (1999) typology is sketched in the table below:

Table 1. Typology of the interplay of focus structure and syntax (Van Valin 1999)

	Rigid Focus Str	**Flexible Focus Str**
Rigid Syntax	(i) French, Toba Batak	(ii) English, Toura
Flexible Syntax	(iii) Setswana, Italian	(iv) Russian, Polish

Following Van Valin, with the expression "pragmatic rigidity" I indicate the existence, in a given language, of constraints on the assignment of the domain of the assertion within the structure of the clause. Pragmatic rigidity and flexibility, therefore, concern the potential focus domain: the languages which license focal constituents in any position of the main clause (in simple sentences) are maximally flexible. Contrastingly, the expression "syntactic rigidity" will solely be used to refer to the encoding of grammatical relations by means of the linear order of the constituents in the clause. This restrictive notion of syntactic rigidity is not Van Valin's own. Indeed, the respective order of the constituents of the clause can be determined by syntactic rules which are independent of the encoding of grammatical relations. In this paper, however, I adopt the said notion to highlight a significant difference between Italian and Sicilian.

English and French are prime examples of pragmatic flexibility and rigidity, respectively, whereas both languages are rigid in syntactic terms. Any clause-internal position can be focal in English, as is shown by the following examples:[1]

(1)   a.   What happened? - MY CAR BROKE DOWN.
       b.   I guess your bike broke down. – MY CAR broke down.

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1.   I indicate focus with small caps.

(2) a. Paul returned the book to Mary in the library.
      b. Paul returned the book to Mary in the library.
      c. Paul returned the book to Mary in the library.
      d. Paul returned the book to Mary in the library.
      e. Paul returned the book to Mary in the library.

(3) Beans I do not like.

The data in (1) to (3) indicate that, in English main clauses, the potential focus domain is not restricted. Due to syntactic rigidity, the subject must be preverbal in declarative clauses (see *What happened?* –*Broke down my car*).[2] Thus, the pragmatic role of focal subjects is marked prosodically (cf. (1b) and (2e)), as is the case with any focal constituent.

Lambrecht (1994: 22) argues that, in French main clauses, the domain of the assertion cannot be preverbal, and thus preverbal focal subjects are banned (with the exception of *wh*-arguments, which figure in a dedicated position, but are not discussed here for simplicity). Since the syntax of French is rigid, in declarative domains this language does not admit postverbal subjects (with a small number of exceptions, which, for brevity, I do not discuss here). Accordingly, in a context like that of (1a), the focal argument will not be the subject (cf. (4a)). As for (1b), its closest counterpart is a cleft sentence (cf. (4b)):

(4) a. *J' ai   ma voiture qui est   en panne.*[3]
         I   have-1sg   my   car   rel   be-3sg   in   breakdown
         'My car broke down.'

      b. *C' est   ma voiture qui   est   en   panne.*
         It   be-3sg   my   car   rel   be-3sg   in   breakdown
         'It is my car that broke down.'

French and English thus represent types (i) and (ii) of Table 1. The types which are of interest to us in this context, however, are (iii) and (iv). Type-(iii) languages restrict the domain of the assertion to a portion of the clause, but are relatively flexible in syntactic terms. For instance, in the Bantu language Setswana, the potential focal domain is limited to the verb and the following part of the clause. Although this language exhibits a tendency towards SVO order (cf. (5a)), it requires a postverbal subject, if this is focal (cf. (5b)). The examples in (5) are drawn from Van Valin (1999).

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2.   With few exceptions, for example the construction known as locative inversion (Levin & Rappaport Hovav 1995) with which we need not concern ourselves here.

3.   The following abbreviations are used in the glosses and the examples: acc = accusative; cl = clitic; cond = conditional mood; dcl = dative clitic; fut = future; ger = gerund; imprf = imperfective; loc = locative; md = mood; neg = negation; nom = nominative; nuc = nucleus; ocl = object clitic; per = periphery; prf = perfective; pp = past participle; pst = past; rdp = Right-Detached Position; rel = relative pronoun; rfl = reflexive clitic; sg = singular; subj = subject.

(5) a. *Monna o-bed-its-e   mosimane.*
         Man   SUBJ-hit-PRF-MD boy
         'The/*a man beat a/the boy.'

     b. *Ho-filh-il-e   MONNA.*
         LOC-arrive-PRF-MD   man
         'There arrived a man/A man arrived.'

Observe that the preverbal argument must be presupposed (cf. (5a)), whilst the post-verbal argument can be interpreted as topical or focal, depending on the context. The focus-structure constraint on the preverbal argument results in a restriction on *wh*-questions: since the *wh*-arguments of such questions are, by definition, focal, they cannot be preverbal subjects, but rather they must be encoded as postverbal agents of passives. Otherwise they figure within a cleft construction (Van Valin 2005: 75).

Similarly to English, type-(iv) languages do not limit the domain of the assertion to a portion of the clause: the potential focus domain is extended to the whole clause. Unlike English, however, they tend not to be subject to any strict syntactic constraints on word order. This type can be said to be represented by Russian, where the linear order of topical and focal elements is not necessarily determined by their grammatical relation to the predicate (cf. (6a)), which is clear evidence of syntactic flexibility. In presentational intransitive structures, the subject can precede or follow the verb (cf. (6b), (6c)), although a preference for a preverbal subject is attested (for the Russian facts see Van Valin 1999):

(6) a. *Viktora zaščiščajet MAKSIM.Ø.*
         V.-ACC   defend-3SG M.-NOM
         'MAXIM defends Viktor.'

     b. *MAŠINA SLOMALAC'.*
         Car   break.down-3SG-PST
         '(My) car broke down.'

     c. *SLOMALAC'   MAŠINA.*
         Break.down-3SG-PST car
         '(My) car broke down.'

In the discussion that follows, it will be proposed that Italian represents type (iii), as is claimed by Van Valin (1999), although the current RRG analysis of Italian word order ought to be slightly revised. Contrastingly, Sicilian is best classified as a language of type (iv). Despite there being an important syntactic constraint on the core-internal immediately prenuclear position, identified in Bentley (2006), Italian is characterized by pragmatic rigidity and relative syntactic freedom. Sicilian, instead, exhibits considerable flexibility in both syntactic and pragmatic terms, since it does not ban the preverbal or postverbal portions of the clause to any grammatical relation or pragmatic role. Word order, however, cannot be

claimed to be entirely free in Sicilian, in that the linear order of the constituents is nonetheless motivated by syntax or discourse. In addition, different orders encode different types of focus.

2.1   Italian

The default position of focal arguments is postnuclear in Italian. This is shown in (7a), which encodes predicate focus, (7b) and (7c), which illustrate narrow focus on the argument, and, finally, (7d), which is an example of sentence focus:[4]

(7)　a.　*Che　fai?* - 　GUARDO　UN FILM.
　　　　What　do-2SG　watch-1SG　a　film
　　　　'What are you doing?' 'I'm watching a film.'

　　b.　*Che　compri?* - *(Compro)* IL　PANE.
　　　　What　buy-2SG　buy-1SG　the　bread
　　　　'What are you buying? 'I'm buying some bread.'

　　c.　*Chi　arriva?* - *(Arriva)*　TUO　ZIO.
　　　　Who　arrive-3SG　arrive-3SG　your　uncle
　　　　'Who is arriving?' 'Your uncle is arriving.'

　　d.　ARRIVA　TUO ZIO!
　　　　Arrive-3SG　your　uncle
　　　　'Your uncle is here!'

Although the domain of the assertion varies in the examples in (7), in that it is limited to one constituent in (7b) and (7c), but not in (7a) and (7d), the focal argument is invariably postnuclear. There is no reason not to assume that, in all cases, it figures in the core-internal immediately postnuclear position:[5]

4.　For the RRG theory of focus structure, based on Lambrecht (1994), I refer to Van Valin & LaPolla (1997: 199–241) and Van Valin (2005: 68–88).

5.　The absence of a pause immediately before this argument indicates that it is not in the Right-Detached Position. As for the possibility that any of the focal arguments in (7) occupy the Post-Core Slot, I assume that this position is dedicated to contrastive focus, similarly to the Pre-Core Slot, which, however, can also marginally host non-focal constituents (I return to the Pre- and Post-Core Slots below). My hypothesis should be tested with experimental analysis of the prosody of constructions like those in (7) and, on the other hand, constructions with a contrastive information unit. Comparative evidence in support of this hypothesis has been found by Ledgeway (p.c.): in Cosentino (a southern Italo-Romance dialect), the verbal forms which can trigger phono-syntactic doubling do so with non-contrastive focal subjects and objects: *vena* RU GUAGLIONE "there comes the boy" (with *ru* instead of *u* "the") and *si mancia* TTUTTO "s/he eats everything" (with doubled [tt]), thus suggesting that, in both cases, the focal element is in the same syntactic unit as the verb (the core).

(7)   a.′   [$_{Core}$[$_{Nuc}$GUARDO] UN FILM].
       b.′   [$_{Core}$[$_{Nuc}$Compro] IL PANE].
       c.′   [$_{Core}$[$_{Nuc}$Arriva] TUO ZIO].
       d.′   [$_{Core}$[$_{Nuc}$ARRIVA] TUO ZIO]!

Significantly, the focal argument is the subject, i.e., the Privileged Syntactic Argu-ment of the clause (henceforth PSA) in (7c) and (7d), but not in (7a) and (7b).[6] In tra-ditional terms, the focal argument of the last two clauses has the grammatical relation object. The fact that the default position of the non-contrastive focal unit of information is the same, regardless of whether this is the PSA, suggests that Italian is flexible in syn-tactic terms, but not in pragmatic terms, in accordance with Van Valin's (1999) claim. In other words, the principle which governs the expression of the focus of the utter-ance can be ranked above that which governs the expression of grammatical relations by means of word order (syntactically, Italian is an SVO language, as is shown by predicate-focus constructions like *Lucia compra il pane* "Lucy buys some bread"). Observe that the counterparts of (7) with the focal element in the immediately prenuclear position are ungrammatical:[7]

(7)   a.′   *Che   fai? -   *UN   FILM GUARDO.*
             What   do-2SG a   film   watch-1SG
             'What are you doing?' 'I'm watching a film.'

       b.′   *Che   compri? - *IL   PANE   compro.*
             What   buy-2SG   the   bread buy-1SG
             'What are you buying? 'I'm buying some bread.'

       c.′   *Chi   arriva? - *TUO   ZIO   arriva.*
             Who   arrive-3SG your uncle arrive-3SG
             'Who is arriving?' 'Your uncle is arriving.'

       d.′   *TUO   ZIO   ARRIVA!
             Your   uncle   arrive-3SG
             'Your uncle is here!'

The data in (7a′) to (7d′) suggest that there is a position of the structure of the Italian clause which is banned to focal units of information: the core-internal immediately prenuclear position. This is evidence of pragmatic rigidity, in the sense defined above.

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6.   I refer to Bentley (2006) for this notion of PSA of the clause, which is based on the RRG theory of grammatical relations, and assumes that, in Italian, the PSA of finite clauses is the argument which controls agreement on the finite form of the verb.

7.   The replies in the examples in (7a′) to (7d′) should not be mistaken for utterances in which the focal unit of information is contrastive. The context of (7a′) to (7c′) indicates clearly that completive focus is involved, in these examples, while (7d′) is intended as a presentational sentence-focus construction. I deal with contrastive focus in section 3.

Consider now the structure of the reply in (8), where the prosodic prominence is on *Paolino*:

(8) *Chi   mangia   il gelato?   *Il gelato   mangia Paolino.*
     Who   eat-3sg   the ice.cream   the ice.cream   eat-3sg   Paolino
     'Who is eating ice-cream?' 'Paolino is eating ice-cream.'

Although the focal PSA of the reply in (8) is in the default position of non-contrastive focal arguments, this structure is not well-formed. Crucially, (8) contrasts with the grammatical clauses in (7c) and (7d), which also have a postnuclear focal PSA, inasmuch as it exhibits an object in the immediately prenuclear position. Compare (8) with the apparently analogous structure in (9), where *il gelato* is the PSA:

(9) *A   chi   piace   il gelato?*
     To   who   appeal-3sg   the ice.cream

     Il   gelato   piace   a Paolino.
     The   ice.cream   appeal-3sg   to   Paolino
     'Who likes ice-cream?' 'Paolino likes ice-cream.'

Piacere is an experiencer predicate, or psych-verb, which requires inversion, i.e., the encoding of the undergoer as the PSA and the experiencer as a non-macrorole argument (see Bentley's 2006 analysis, based on Bossong 1998 and Van Valin 1990). Since the argument in the immediately prenuclear position is the PSA, the reply in (9) is well-formed. In Bentley (2006), I have claimed that the principle which strives to assign the immediately prenuclear position to the PSA of the clause, and the constraint which bans the nominal (non-dative) object from this position, are manifestations of accusative alignment, i.e., a type of alignment which marks arguments according to their grammatical relation to the predicate.[8] Needless to say, the structure in (9) also abides by the pragmatic principle which establishes that the immediately postnuclear position is the default site of the focal argument in the clause.

The above data suggest that Italian word order is not entirely flexible in syntactic terms. The notions of syntactic and pragmatic rigidity and flexibility must indeed be conceived of as continua, rather than in discrete terms. The crucial evidence to classify Italian as a language of type (iii) is that the syntactic constraint on the immediately prenuclear position

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8.   Observe that constructions like *Che hai dimenticato? Le chiavi, ho dimenticato* "What did you forget? The keys, I forgot" do not invalidate this view of Italian word order, since a pause between the argument and the verb indicates that the focal object must figure in its canonical, core-internal, position, whereas the predicate is in the Right-Detached Position, the default position of afterthoughts (see Benincà 1988: 146 and Salvi & Vanelli 2004: 307 for a discussion of afterthoughts). As for clauses such as *Qualcosa faremo* "Something we will do" or *Qualcuno devono aver visto* "Somebody they must have seen", the prenuclear focal argument is contrastive here, and figures in a core-external position (see below the discussion of contrastive focus, and Vanelli 1986, 1998 for a treatment of quantifiers and contrastive focus).

does not interfere with the assignment of focus to the immediately postnuclear position. In fact, the focal PSA of transitive clauses can figure in the core-internal immediately post-nuclear position, if the object is detached (cf. (10a)) or in the Pre-Core Slot (cf. (10b)):

(10)   a.   (*Il   gelato,*)   *lo*   *mangia* Paolino.
            The   ice.cream   OCL   eat-3SG   Paolino
            'As for the ice-cream, Paolino eats it.'

       b.   *Il   gelato   /Questo lo   mangia* Paolino
            The   ice.cream   this   OCL   eat-3SG   Paolino
            'As for the ice-cream/this, Paolino eats it.'

The fact that the prenuclear argument is the antecedent of a core-internal resumptive clitic suggests that in neither case is the said argument core-internal.[9] In addition, in (10a), a pause separates this argument from the core, which suggests that the argument is in the Left-Detached Position. In the absence of a pause in (10b), it can be assumed that the extra-core argument is in the Pre-Core Slot.

To conclude, I have identified two constraints on the core-internal prenuclear position of Italian; one is pragmatic and bans focal elements from this position, the other is syntactic and bans the object from it. Neither constraint is violable. However, the syntactic principle which strives to place the PSA in the core-internal immediately prenuclear position can be violated for pragmatic reasons (cf. (7c) and (7d)). Thus, the expression of information structure can outrank the encoding of grammatical relations by means of word order. Contrastingly, the encoding of grammatical relations does not appear to interfere with information structure. I conclude that Italian represents type (iii) of Van Valin's (1999) typology.

2.2   Sicilian

In striking contrast with Italian, Sicilian is not subject to the two constraints identified above and concerning the core-internal prenuclear position:

(11)   a.   *Chi   successi?* -   Tò   ziu   arrivau!
            What   happen-3SG-PST   your   uncle   arrive-3SG.PST
            'What happened?' 'Your uncle has arrived!'

       b.   *Chi   successi?* -   arrivau   Tò   ziu!
            What   happen-3SG-PST   arrive-3SG-PST   your   uncle
            'What happened?' 'Your uncle has arrived!'

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9.   Following Belloro (2004), I take object clitics to figure in the Agreement Index Node, a dependent of the nucleus. I further assume that accusative resumptive clitics are obligatory in Italian when the co-referent nominal argument does not co-occur with the nucleus within the core. The latter assumption should not be extended to the Romance varieties which display clitic doubling (see, e.g., Belloro 2004).

    c.   *Chi   accattasti? - NA MACHINA accattai.*
          What buy-2SG-PST a   car   buy-1SG-PST
          'What did you buy?' 'I bought a car.'

    d.   *Chi   accattasti? - Accattai   NA MACHINA.*
          What buy-2SG-PST buy-1SG-PST a   car
          'What did you buy?' 'I bought a car.'

Examples (11a) and (11b) are sentence-focus constructions, whereas (11c) and (11d) are constructions with narrow focus on an argument (see note iv). These data indicate that, in Sicilian, the focal argument can figure in prenuclear or postnuclear position; its focal role is indicated prosodically. Like the postnuclear focal position, the prenuclear one is core-internal, as is clearly suggested by the contrast between (12a) and (12b):

(12)   a.   *Chi   ci   accattasti   a   tò   niputi?*
            What DCL buy-2SG-PST to your nephew

           NA MACHINA (*a mè niputi) (*ci   accattai*).
            A   car   to my nephew DCL buy-1SG-PST

           'What did you buy for your nephew?' 'I bought a car (for my nephew).'

      b.   *Chi   ci   accattasti   a   tò   niputi? A bicicretta?*
            What DCL buy-2SG-PST to your nephew the bike

           NA MACHINA, a mè niputi, ci   accattai.
            A   car   to my nephew DCL buy-1SG-PST

           'What did you buy for your nephew? A bike?'
           'A car I bought for my nephew.'

Since the focal argument can be separated from the nucleus by a dative nominal argument in (12b), but not in (12a), there must be a syntactic difference between the two constructions. In particular, the focal argument of (12a) is likely to be inside the core, whereas that of (12b) is not.[10] Anticipating somewhat the contents of section 3, it should be noted that the two examples diverge in that (12a) clearly involves completive focus (the new element of information simply fills a variable which is left open in the question), as is the case with the argument of (11c) and (11d), whilst (12b) involves contrastive focus (the new element of information contrasts with an antecedent in the question). I shall not dwell on this difference here. I wish to stress, however, that there is reason to assume that the focal argument of (12a) is inside the core, on a par with that of the structures in (11). Sicilian, therefore, is not subject to the pragmatic constraint of Italian which bans focal units from the core-internal immediately prenuclear position.

    According to the proposed analysis of the Sicilian data, this language is also free from the syntactic constraint identified in Italian, since the object is not ousted from the core-internal immediately prenuclear position (cf. (11c)). Therefore, with respect

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10.   The structure illustrated in the reply of (12b) was first discussed in Cruschina (2006).

to Van Valin's (1999) typology, Sicilian would seem to classify as a language of type (iv). In fact, on the one hand, the domain of the assertion appears to comprise the whole clause (for further discussion, see section 3). On the other hand, direct arguments can immediately precede or follow the nucleus within the core, regardless of their grammatical relation to the predicate.

Arguing that a language represents type (iv) of Table 1 does not amount to claiming that it has free word order. In Sicilian, for instance, the PSA of the clause need not be focal to figure in the core-internal prenuclear position,[11] whereas the object can only figure in this position if it is focal. Compare (13a), where the PSA of the clause is focal, with (13b), where it can be considered to be topical. In both cases, the PSA figures immediately before the nucleus:

(13) a.   *Chi*   *successi?* -   *A*   *MACHINA spiriu!*
           What   happen-3SG-PST   the car   disappear-3SG-PST
           'What happened?' 'The car has disappeared!'

      b.   *Picchì* *ti*   *ni*   *sta*   *iennu a peri?*
           Why   RFL   CL   stay-2SG go-GER to foot

           A   *machina* UN VOSI   PARTIRI.
           The car   NEG want-3SG-PST start

           'Why are you going on foot?' 'The car won't start.'

The occurrence of the object in the core-internal immediately prenuclear position, instead, must be legitimized by its role as (part of) the focus of the assertion:

(14) a.   *Chi*   *successi?* -   *A*   *MACHINA SI   PIGGHIARU!*
           What happen-3SG-PST   the car   RFL take-3PL-PST
           'What happened?' 'Somebody took the car!'

      b.   *Unn'* *è*   *a*   *machina?* - *A   machina SI   PIGGHIARU!*
           Where be-3SG the car   the car   RFL take-3PL-PST
           'Where is the car?' 'Somebody took it!'

Observe in passing that, on a par with Italian, Sicilian rules out OVS order (with a nominal O) inside the core:

(15) *Cu*   *accattau*   *i*   *cannola?* - (*I c. accatau)   PIPPINU.
      Who buy-3SG-PST the cakes   the c. buy-3SG-PST Pippinu
      'Who bought the cakes?' 'Pippinu bought the cakes.'

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11.   It must be focal to follow the nucleus immediately. However, I have identified a variety of Sicilian where a postnuclear PSA can be topical (see Bentley 2007). This variety, which is recorded in Giuseppe Pitrè's nineteenth-century fairy tales (*Fiabe, novelle e racconti popolari siciliani*, Catania: Clio, 1993), might be the last vestige of a stage in which the finite nucleus occupies the first position in the core, for syntactic reasons, as is the case with Modern German (see Van Valin & Diedrichsen 2006).

The ban on OVS order inside the core shows a tendency towards accusative alignment, even though it cannot be argued that the place of direct arguments in the Sicilian core is invariably faithful to accusative alignment. As well as by examples like those in (11), such a statement might be weakened by constructions like (16), particularly if one assumes that, instead of SOV order inside the core, they involve a core-external PSA:

(16) *Iu* TUTTI COSI *sacciu   fari.*
       I   all   things know-1SG do
       'I can do everything.'

Significantly, the few existing treatments of word order in Sicilian point out that core-internal XV order, with a focal X, is emphatic (Leone 1995: 59). Cruschina (2006) claims that this order expresses (i) relevance, i.e., the relevance of a focal element of information in the reply to a question, and the intention of the speaker to highlight it, or (ii) unpredictability, in exclamative contexts. In other words, this order can be claimed to convey an affective value, as is typical of comment-topic utterances (Bally 1932; Sornicola 1983). Thus, the most spontaneous reply to a question like *Chi sta facennu u picciriddu?* "What is the child doing?" displays (S)VO order (*si sta manciannu a pasta* "He is eating pasta"), unless an affective connotation of surprise or irritation is conveyed (*a pasta si sta manciannu!* "(What do you think he could be doing?) He is eating pasta").

In constructions with a non-verbal predicate and a copula, or a co-predicate, Sicilian exhibits a clear tendency for the non-verbal predicate to figure before the accompanying unit:

(17) a. *Cu   è? -   Iu sugnu.*
          Who   be-3SG I   be-1SG
          'Who is it?' 'It's me.'

      b. *Tintu è(ni).*
          Bad   be-3SG
          'He is bad.'

      c. *Ccà   sugnu.*
          Here   be-1SG
          'I'm here.'

      d. *A   FREVI   aju.*
          The   temperature have-1SG
          'I've got a temperature.'

Each of the clauses in (17) displays a complex nucleus, with a focal, non-verbal, component.[12] It is interesting that the focal component of the nucleus precedes the other one. Thus, the comment-topic order is not only found between the predicate and its arguments, but also within the nucleus.

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12. The structure in (17d) could be considered to be a nuclear co-subordination, but this point will be disregarded here, since it is not relevant to the present discussion.

To conclude, Sicilian proves to be a language of type (iv), since it is characterized by considerable pragmatic and syntactic flexibility. It would nonetheless be misleading to state that word order is free, in this language, since the orders SV and VO can only be violated for pragmatic reasons and OVS order is banned inside the core. In addition, the position of the focal unit inside the core is indicative of whether an affective connotation is being conveyed.

2.3   Semantic constraints

The analysis conducted above has revealed that two languages which are strictly related in genetic terms represent different linguistic types inasmuch as the interplay of syntax and focus structure is concerned. It is now time to point out that, in spite of the differences brought to light above, the two languages under scrutiny are subject to analogous semantic constraints on sentence focus. These restrictions prove to be inherent to the nature of presentational constructions, and thus to be more general than the syntactic and pragmatic forces discussed in the previous sections. They are relevant to the present discussion for two reasons. First, they explain why VS order in Italian, and VS or SV order with a focal PSA in Sicilian, occur more frequently with some predicates than with others. Secondly, they explain which intransitive predicates can be followed by the PSA immediately within the core, and which ones cannot (see also section 3).

The pervasiveness of VS order in Italian has led many to follow Burzio (1986) in assuming that the so-called verb-subject inversion is free in this language. The findings of corpus analysis suggest, however, that, in the vast majority of cases, the placement of the PSA of the clause immediately after the nucleus is licensed by predicates which denote existence, appearance on the scene, disappearance from the scene, and continuation or change of a state (Bernini 1995; Sornicola 1995; Wandruszka 1982). In general, these are monoargumental predicates which denote contingent states or events, and, being informationally light (in the sense of Levin & Rappaport Hovav 1995), are suited for introducing a new referent in discourse. The study of corpora, therefore, suggests that VS order is much more frequent in presentational constructions than in any other type of structure.

Even though the predicates of presentational constructions very often classify as unaccusative (in the sense of Perlmutter's 1978 Unaccusative Hypothesis), i.e, in RRG terms (Van Valin 1990), states, achievements and accomplishments, it has been noted that unergative predicates are also found in presentationals. Typically, these are activities which, when followed by the PSA of the clause, encode an unexpressed, speaker–oriented location ("here") (Benincà 1988: 124–125), for instance *chiamare* "call", *telefonare* "phone", *bussare* "knock".[13] Thus, the examples in (18b) and (18c), similarly

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13.   According to Benincà (1988: 124–125), the unexpressed, speaker-oriented, location is a topic. This claim raises the question whether presentational (sentence-focus) constructions can

to that in (18a), are well-formed presentational constructions with VS order, whereas the one in (18d) is not, since its predicate does not encode an unexpressed location:

(18)   a.   *ARRIVA   IL   POSTINO!*
            Arrive-3SG the postman
            'The postman is coming (here)!'

       b.   *HA   TELEFONATO IL   DIRETTORE.*
            Have-3SG phone-PP   the director
            'The director phoned (here, us).'

       c.   *STA   CHIAMANDO IL   BAMBINO!*
            Stay-3SG call-GER   the   child
            'Our child is calling (here, us)!'

       d.   **STA   CANTANDO IL   BAMBINO!*
            Stay-3SG sing-GER   the   baby
            'Our child is singing!' (the intended reading is presentational)

It has been argued (Tortora 1997, 2001) that a number of unaccusative verbs are only found in presentational constructions with VS order if they are marked aspectually. Accordingly, the two examples with *partire* "leave" in (19a) and (19b) differ in that the most natural interpretation of the latter is presentational, whilst that of the former involves contrastive focus on the postnuclear PSA:

(19)   a.   *Parte   MIO CUGINO.*
            Leave-3SG my cousin
            'It is my cousin who is leaving.'

       b.   *È   PARTITO MIO CUGINO.*
            Be-3SG leave-PP my   cousin
            'My cousin has left.'

Observe that *partire* "leave" (cf. (19a) and (19b)), unlike *arrivare* "arrive" (cf. (18a)), does not encode an understood speaker-oriented location when followed by the PSA of the clause.

Similarly, Bentley (2006: 371–382) has noted that activity predicates do not normally figure in presentational constructions, even when they entail a speaker-oriented location, unless they are marked aspectually (compare (18b) with

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exhibit topical information units. The treatment of this issue is not within the scope of this work. Suffice it to say that, in Bentley (2006: 251–321), I have claimed that there are sentence-focus constructions which present new elements of information as topics and thus introduce a new topic-focus contrast in discourse.

telefona IL DIRETTORE which would normally be read as "it is the director who is phoning").[14]

Finally, an expressed location, a dative argument or another topic in prenuclear position can also contribute to the licensing of presentational VS order:

(20) a. *All' orizzonte BIANCHEGGIAVA   UNA NAVE.*
          At-the horizon appear.white-3SG-IMPRF a   ship
          'A white ship could be seen on the horizon.'

      b. *Di don Silverio NON GIUNSE   PIÙ   NOTIZIA ALCUNA.*
          Of don Silverio NEG arrive-3SG-PST more news   any
          'No more news of *don* Silverio was ever heard again.'
          (Masina, *Il volo del passero*, p. 20, cited in Bentley 2006: 382)

In the light of the above facts, Bentley (2006) has proposed that, in Italian, presentational constructions with VS order encode stage-level states or events, and their stage-level eventive character can be contributed by *Aktionsart*, aspect, and a location or another type of topic. To be sure, intransitive predicates which are not eventive can be followed by the PSA of the clause. In this case, however, the postnuclear argument receives a contrastive interpretation (cf. (18d)). Contrastive focus, and its relation to syntax, will be treated in section 3.

Sicilian presentational constructions are subject to constraints which are comparable to those outlined above for Italian, and hold true regardless of whether the focal – and prosodically prominent – PSA figures immediately before or after the nucleus. Accordingly, the examples in (21) would require VS order in their Italian equivalents with presentational focus, whereas the structure in (22) is not presentational, and the focal argument would normally be interpreted as the only member singled out in a finite set:

(21) a. *MURIU   PIPPINU/ PIPPINU MURIU!*
          Die-3SG-PST Pippinu Pippinu die-3SG-PST
          'Pippinu died!'

      b. *CHIAMAU   PIPPINU/ PIPPINU CHIAMAU!*
          Call-3SG-PST Pippinu Pippinu call-3SG-PST
          'Pippinu called (here, us)!'

      c. *UN CI   PARTI   A MACHINA/ A   MACHINA UN CI   PARTI!*
          NEG DCL start-3SG the car   the car   NEG DCL start.3SG
          'His/Her car won't start!'

(22) *Parrau   PIPPINU/ PIPPINU parrau.*
       Speak-3SG-PST Pippinu Pippinu speak-3SG-PST
       'It is Pippinu who spoke.'

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14. For simplicity, I abstract away from the stylistic and textual constraints on VS order, which are beyond the scope of this work.

Needless to say the two sets of examples in (21) diverge, in that SV order carries the affective connotation which was discussed in section 2.2.

In the last analysis, there are semantic constraints on the predicate of presentational constructions which hold true regardless of the relative rigidity or flexibility of focus structure and syntax in a given language. These restrictions explain why VS order in Italian, and VS or SV order with a focal S in Sicilian, are more often found with some types of predicates than with others. In the next section, the syntactic position of postnuclear PSAs will be investigated. It will be argued that the PSA of presentational constructions follows the nucleus immediately within the core, whereas postnuclear contrastive arguments figure in another position of the layered structure of the clause.

3.   More on pragmatic roles and word order: Extra-core positions

The discussion has so far dealt with non-contrastive focus. It is well-known, however, that focal units can also be contrastive. A relevant example, first given in (1b), is repeated below for convenience:

(1)   b.   I guess your bike broke down. – My CAR broke down.

The unit *my car* provides the new element of information in the reply, and contrasts with an antecedent which is introduced previously in discourse (*your bike*): it is thus a contrastive focal unit. Consider now the Italian examples in (23):

(23)   a.   *Hai   strappato tu   il   libro? Luca l'   ha   strappato!*
       Have-2SG tear-PP   you the book   Luca OCL   have-3SG   tear-PP
       'Was it you who tore the book?' 'It was Luca!'

       b.   *Hai   strappato tu   il   libro? L'   ha   strappato Luca!*
       Have-2SG tear-PP   you the book   OCL have-3SG   tear-PP   Luca
       'Was it you who tore the book?' 'It was Luca!'

       c.   *Chi   va   a comprare   il   pane? Vado   io.*
       Who go-3SG to buy   the bread go-1SG I
       'Who goes/is going to buy bread?' 'I do/will.'

       d.   *Chi   va   a comprare   il   pane? Io ci   vado.*
       Who go-3SG to buy   the bread I   LOC   go-1SG
       'Who goes/is going to buy bread?' 'I do/will.'

The replies in (23) illustrate contrastive focus. In (23a) and (23b), the focal unit *Luca* contrasts with an antecedent (*tu*), as is the case with the focal unit of (1b). In (23c) and (23d), the new unit of information (*io*) does not contrast with an antecedent previously mentioned in discourse. Rather, it is the focal member of a finite set, in

particular, the set of people who could go to buy bread.[15] The former type of contrastive focus can be subsumed within the latter, since, in both cases, this type of focus singles out a member of a finite set.

The point to be discussed here is the position of contrastive focal units in the syntax of Italian main clauses. The adherents to the Chomskyan model (see Rizzi 1997 and subsequent work) claim that the site of prenuclear contrastive focal units is in the so-called "left periphery" of the clause, to the left of the IP. There are, indeed, at least three kinds of evidence that the position of *Luca* in (23a) and *io* in (23d) is not the canonical subject position, in our terms the core-internal, immediately prenuclear, position. First, native speakers tend to agree that, prosodically, this argument is clearly prominent, unlike a topical prenuclear PSA (see *Luca* in *Luca HA STRAPPATO IL QUADERNO* "Luca tore the workbook"). Secondly, this argument can be separated from the nucleus by one or more topics (Rizzi 1997):

(24) *LUCA, ieri,   per sbaglio, l'   ha   strappato, non io.*
      Luca yesterday by mistake OCL have-3SG tear-PP   NEG I
      'It was Luca who tore it, yesterday, by mistake, not me.'

Finally, contrastive objects can be found in the same position, and are prominent prosodically, unlike the object of ungrammatical structures like (8):

(25) *IL LIBRO, per sbaglio, Luca ha   strappato, non il   quaderno.*
      The book by   mistake Luca have-3SG   tear-PP   NEG the workbook
      'It is the book that Luca tore by mistake, not the workbook.'

Observe that the contrastive object in (25) co-occurs with the PSA of the clause, which figures in its canonical position.

In the RRG theory of the structure of the clause, the position which precedes the core and typically hosts focal elements of information is the Pre-Core Slot. The *wh*-argument of *wh*-questions, for instance, figures in this position, if it precedes the core. I assume, therefore, that the Pre-Core Slot can host contrastive prenuclear elements in Italian. Incidentally, such units of information cannot co-occur with the *wh*-argument of a *wh*-question (*LUCA, QUANDO l'ha strappato, non tu?* "When did Luca tear it, not you?"), even though this is also true if the contrastive unit follows the core (*QUANDO l'ha strappato LUCA, non tu?* "When did Luca tear it, not you?").

In the light of the pragmatic rigidity of Italian (see section 2.1), it is somewhat surprising that this language exhibits a prenuclear area for the expression of focus which is not exclusively dedicated to *wh*-arguments, as previously assumed in RRG. The evidence discussed in this section, however, does not invalidate the claim that Italian is pragmatically rigid (in the sense defined above). Rather, it shows that it is solely a portion of the prenuclear space that is excluded from the domain of the assertion, in this language,

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15.   Depending on the broader context, the example in (23c) could also involve non-contrastive focus.

and not the entire preverbal space in the clause. In the light of the above results, it can be assumed that this portion corresponds to the core-internal immediately prenuclear position. This assumption will be slightly modified below in the light of further evidence.

The question which arises now is what syntactic unit intervenes between the Pre-Core Slot and the core, in clauses such as those illustrated in (24) and (25). On the assumption that the position under investigation is inside the clause (it follows the Pre-Core Slot), it cannot be the Left-Detached Position. Rather, it must be a periphery of the core. This hypothesis is substantiated by the appearance in this position of adverbial phrases (*per sbaglio* "by mistake" in (24) and (25)), locational and temporal adjuncts (cf. (24), (26a) and (26b)), and, finally, adverbial clauses, in particular, clauses which tend to function as topics, in that they set the scene for the contents of the main clause (cf. (27a) and (27b)):

(26) a. Questo, *sull' autobus, ti ho dato, non quello.*
This on.the bus DCL have-1SG give-PP NEG that
'It's this one that I gave you, on the bus, not that one.'

b. Questo, *stamattina, ti ho dato, non quello.*
This this.morning DCL have-1SG give-PP NEG that
'It's this one that I gave you, this morning, not that one.'

(27) a. Questo, *quando puoi, gli dovresti dare.*
This when can-2SG DCL must-1SG-COND give
'It's this one that you should give him, when you can.'

b. Questo, *se non ti dispiace, gli dovresti dare.*
This if NEG DCL displease-3SG DCL must-1SG-COND give
'It's this one that you should give him, if you do not mind.'

I thus propose the following clause structure for (25) and the comparable examples (in (24), there is simply more than one peripheral unit before the core):

(25′) [[[$_{\text{Pre-Core Slot}}$ Il libro], [$_{\text{PER}}$ *per sbaglio*], [$_{\text{Core}}$ *Luca ha …*]], [$_{\text{RDP}}$ *non …*]]

To be sure, other syntactic units can marginally intervene between a contrastive focal element and the rest of the clause, and these are not peripheral syntactic units, since they are arguments:

(28) *Che hai comprato a tuo nipote? La bicicletta?*
What have.2SG buy-PP to your nephew the bike

(?)*Una macchina, a mio nipote, ho comprato.*
A car to my nephew have.1SG buy-PP

'What did you buy for your nephew? A bike?'
'A car I bought for my nephew.'

However, there is reason to believe that the structure of the reply in (28) differs from (25′). Example (28) is the Italian equivalent of the Sicilian evidence given in (12b)

(note that dative resumptive clitics are optional in Italian but not in Sicilian). In Sicilian, however, the topicalization strategy which is illustrated in (24) to (27) yields odd results,[16] whereas a contrastive unit of information in the Pre-Core Slot can be followed by an argument, which in turn is followed by the nucleus in a different syntactic position. See (29), as well as (12b):

(29) Pippinu, a   littra, a   scrissi,   no   io.
      Pippinu   the   letter   OCL   write.3SG.PST   NEG   I
      'It was Pippinu who wrote the letter, not me.'

The reason why the position which follows the Pre-Core Slot can be filled by an argument but not easily by an adverbial, in Sicilian, is hard to pin down, unless we assume that two different structures are illustrated in (12b), (28) and (29), on the one hand, and, on the other hand, (24) to (27). I thus propose that the dative argument is in its canonical position, i.e., inside the core, in (12b) and (28), whilst the nucleus figures in the Right-Detached Position as an afterthought. In (29), it is again the object (here the undergoer) that stands alone in the core. The proposed structure is thus as follows:

(28′)   [[$_{Pre-Core Slot}$ UNA MACCHINA], [$_{Core}$ a mio n ...]], [$_{RDP}$ ho comprato ...]]

The virtual absence in Sicilian of the topicalization strategy shown in (24) to (27) is likely to be related to the pragmatic flexibility of this language, i.e., its reluctance to associate specific positions with particular pragmatic roles, be it in specific constructions. Italian, on the other hand, is not pragmatically flexible and makes use of this kind of strategy. Significantly, the topicality of the pre-core periphery indicates that the ban on prenuclear focal material, in Italian, affects the entire space between the Pre-Core Slot and the nucleus, and not simply the prenuclear portion of the core.

Contrastive focus can also be expressed to the right of the nucleus (cf. (22), for Sicilian, and (23b), (23c), for Italian), and, in both Italian and Sicilian, the contrastive unit is clearly prominent prosodically. An issue which awaits investigation is whether, and to what extent, the kind of prosodic prominence that characterizes postnuclear focal units differentiates between contrastive and non-contrastive focus.

Transitive clauses provide evidence which suggests that postnuclear contrastive focal units figure outside the core (Bentley 2006: 375):

(30) Ha   vinto   il   premio quello studente.
      Have-3SG win-PP   the   prize   that   student
      'It is that student that won the prize.'

Since the object is in its canonical position, in (30), the PSA is likely to be outside the core, in particular, in the Post-Core Slot. If, as is assumed here, this is the position of all postnuclear contrastive focal arguments in Italian and Sicilian, it follows that the

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16. I am thankful to Silvio Cruschina for helpful discussion on this subtle aspect of word order in Sicilian.

positions of prenuclear and postnuclear contrastive arguments are symmetrical: the Pre-Core Slot and the Post-Core Slot.

An important corollary of this proposal is that the core-internal immediately postnuclear position can only be occupied by non-contrastive focal units, for instance the object of transitive predicate-focus constructions. The PSA of the clause will figure in this position in presentational constructions (see section 2.3), i.e., if the predicate denotes a contingent state or event, or if it bears completive focus, as in one reading of the reply to a *wh*-question like: *Chi ha portato questi fiori? Li ha portati Maria* "Who brought these flowers? Maria brought them". By contrast, if the predicate or the context require a contrastive reading of the postnuclear PSA, this will not occur inside the core, but rather in the Post-Core Slot. I illustrate this contrast in (21a′) and (22′):

(21)   a.′   [$_{Core}$*MURIU PIPPINU*]

(22′)   [$_{Core}$*Parrau*] [$_{Post-Core Slot}$ *PIPPINU*]

In accordance with the findings discussed in section 2.3, it should be pointed out that the position of postnuclear PSAs does not depend on the unaccusative vs. unergative divide, as is often assumed in the literature on Italo-Romance syntax, but rather on the pragmatic role of the PSA of the clause, which is affected – but not entirely determined – by the *Aktionsart* of the predicate.

By way of conclusion of this discussion, it is worth mentioning the following. The above analysis has shown that the availability of symmetrical portions of the clause in prenuclear and postnuclear position allows us to capture the expression of focus without any unnecessary displacement of the nucleus, or of any other syntactic unit in the clause.

4.   The RRG theory of focus structure and syntax

From our findings there arise two subtle theoretical questions which are of interest to the study of the interplay of focus structure and syntax from an RRG perspective. The analysis of the domain of the assertion in Italian led me to conclude that this language is subject to a constraint which concerns the core-internal immediately prenuclear position and the periphery that precedes the core: this portion of the clause cannot be focal. The said restriction differentiates Italian from its sister language Sicilian, and crucially makes it a language that is pragmatically rigid. Since focal units of information can occur both in the Pre-Core Slot (which is not limited to *wh*-words) and in the nucleus plus the postnuclear space, the domain of the assertion is discontinuous in Italian. It follows that the positions in the layered structure of the clause which define the potential focus domain of a language need not be adjacent. This fact, which, to my knowledge, is not explicitly recognized in the existing treatments of RRG, is, however, easily accommodated within the RRG theory of the interplay of focus structure and syntax.

The second theoretical question arises from the identification of a topical periphery in the Italian construction exemplified in (24) to (27). By definition, in RRG, the periphery of the core is a space which hosts adjuncts and adverbials that modify the core, but are not part of the semantic representation of the predicate. At first blush, the above discussion might seem to run counter to the semantic rationale of the notion of periphery, since the pre-core periphery of (24) to (27) is associated with a specific role in discourse. The proposed analysis is not problematic, however, since the topicality of the pre-core periphery, in Italian, simply follows from the independent ban on focal material in the space between the Pre-Core Slot and the nucleus. The topicalization strategy under discussion capitalizes on this ban to contrast a focal argument with one or more topical non-arguments. This fact is significant vis-à-vis the interplay of focus structure and syntax in Italian, but not in terms of the RRG definition of periphery. In the last analysis, it must be noted that syntactic positions which are defined in semantic terms (e.g., periphery) may be associated with specific pragmatic roles, in accordance with the pragmatic parameters of word order which are at work in the language under study.

5. Conclusion

In this paper I have examined the micro-parametric variation of main-clause word order in Italian and Sicilian, and I have found that Van Valin's (1999) claim on the typological variation in the interplay of focus structure and syntax proves to be valid when tested against evidence from closely-related languages. Word-order patterns manifest the tension of syntactic and pragmatic parameters which may be ranked differently in closely related, as well as unrelated, languages. Word order, however, is also affected by semantic restrictions which appear to be relatively constant across languages.

The effects on Italian word order of two constraints on the core-internal immediately prenuclear position have been analysed. Although one of these restrictions is syntactic and the other pragmatic, it has been argued, in accordance with Van Valin (1999), that Italian is rigid in pragmatic terms and relatively flexible in syntactic terms, since the requirements of information structure can interfere with those of syntax (the encoding of grammatical relations by means of word order), but this does not hinder the expression of information structure. In contrast with Italian, Sicilian is not subject to either of the constraints identified for Italian, and proves to be flexible in both pragmatic and syntactic terms, since it does not preclude any portion of the clause to arguments with a specific pragmatic role or grammatical relation. Significantly, this flexibility does not amount to free word order, since the linear order of the constituents of the main clause is nonetheless motivated in syntactic or pragmatic terms. In addition, different types of order denote different types of focus.

In the discussion of the postnuclear space of the clause, it has been claimed that contrastive and non-contrastive postnuclear units figure in different positions in

Italian. The analysis of the encoding of pragmatic roles in extra-core positions has led to the consideration of two theoretical questions regarding the notions of potential focus domain and of periphery. It has been pointed out that the potential focus domain of a given language can be discontinuous, and this discontinuity does not solely concern the placement of *wh*-words in the Pre-Core Slot. In addition, it has been noted that syntactic positions which RRG defines in semantic terms may be associated with a specific role in discourse, in accordance with the pragmatic parameters of word order which are at work in the language under study, but this does not affect the theoretical definition of these positions.

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How missing is the missing verb?

The verb-less numeral quantifier construction in Japanese

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The construction containing the so-called "lonesome numeral classifier" would be a challenge for syntactic theory because of the absence of a verb which is expected for a case-marked argument. Properties of the construction have been unclear between two competing approaches, a VP analysis which favors the structural presence of a missing verb and a NP analysis which claims only the semantic representation of it. In an attempt to solve the inherent difficulties associated with the previous claims, the present study integrates a discourse representation structure into semantic and structural representation, and proposes a proper linking for these structures. The proposed three-way representation captures the critical properties of the construction, rooted in the structurally absent, semantically present, and discourse-driven "missing" verb.

1. Introduction

Quantifiers including numeral classifiers represent one of the most discussed areas in the studies of Japanese syntax and semantics (Downing 1996; Shimojo 2004; Amazaki 2005; see also references cited therein). The breadth of interest is reasonable given the variety in quantifier constructions as well as the rich array of classifier stock in Japanese. The present study discusses a particular quantifier construction which has been under-discussed in the literature, examines its functional properties, and explores representations in Role and Reference Grammar.

By way of introduction, examples of two representative quantifier constructions are given in (1) and (2). In the prenominal quantifier construction (1), the numeral and the classifier *ni-ko* precede the head noun *ringo*. In (2), which represents a so-called quantifier float, the numeral plus classifier string is separate from the case-marked head noun.

(1)　taro-ga　　[ni-ko no　ringo]-o　　katta
　　　Taro-TOP 2-NC　GEN apple-ACC　bought
　　　'Taro bought two apples.'

(2)   taro-ga   [ringo]-o ni-ko katta
          Taro-TOP apple-ACC 2-NC bought
          'Taro bought two apples.'

The quantifier construction to be examined in this study is similar to the one given in (2); however, in this construction, there is no verb that follows the constituent containing the floated quantifier and the head noun, unlike the regular counterpart containing an overt verb. Examples are given in (3) and (4).

(3)   taro-ga   katta-no-wa   [ringo-o   kyoo ni-ko] da
          Taro-NOM bought-NMZ-TOP apple-ACC today two-CL COP
          Lit. 'It is [two apples today] that Taro bought.'

(4)   taro-no   oyatu-ni-wa   [ringo-o   kyoo ni-ko]-ga datoo   da
          Taro-GEN snack-for-TOP apple-ACC today 2-NC-ACC adequate COP
          'As for Taro's snack, (eating/consuming/giving him/etc.)
          [two apples today] is adequate.'   (Fukushima 2003: 316)

The unusual characteristic of this construction is manifested by the "surprising constituent" (Takano 2002), the string containing an accusative argument and an accompanying floated quantifier, which is separated from the verb. In the cleft sentence in (3), the surprising constituent is accompanied by the copula, instead of the verb that appears in the topic position. The sentence in (4) is an extreme case which contains what Fukushima (2003) calls a "lonesome numeral classifier". In this case, the copula is present as in (3); but the verb expected for the accusative argument is entirely missing in the sentence, despite the overt case marking on the argument.

    So, what is interesting about the construction? Unlike a cleft sentence containing the verb for the accusative argument (e.g., (3)), the lonesome numeral classifier construction, as shown in (4), presents a challenge for syntactic theory due to the need to solve a paradox – the absence of a verb and the presence of the argument that bears the case marker. For this reason, the present study examines the lonesome numeral classifier construction in particular and how this unusual property may be represented in Role and Reference Grammar in a not-so-unusual manner.

2.   Previous claims

With respect to the unusual quantifier construction, whether the construction given in (3) or (4) earlier, there have been competing proposals, resulting in two different interpretations of the argument-quantifier constituent. According to Koizumi (2000), the constituent is a VP containing an empty verb (which is separated from the overt verb by movement rules). Fukushima (2003) argues against Koizumi's VP

analysis and claims a NP status for the constituent (hence no verb). The two proposals are outlined below.

2.1   Koizumi's remnant VP analysis

Assuming that syntactic movement is involved in cleft sentences, Koizumi (2000) proposes verb raising out of a VP to derive the verb-less constituent in question. Consider the example given in (5), which is similar to the one given earlier.

(5)   taro-ga   tabeta no-wa   [$_{VP}$ ringo-o   ni-ko [$_V$ e]]   da
      Taro-NOM   ate   NMZ-TOP   apple-ACC 2-NC   COP
      'It is two apples that Taro ate.'

In a nutshell, Koizumi claims the following process to derive the sentence above.

a.   Subject [$_{VP}$ DO V]
b.   Subject [$_{VP}$ DO t$_v$] V
c.   [Subject t$_i$ V] no-wa [$_{VP}$ DO [$_v$ e]]$_i$ da

The empty verb in (b) is created by raising the verb out of the VP in a string vacuous manner. The verb raising is followed by the movement of the remnant VP, which derives the cleft sentence, as shown in (c).

An obvious stumbling block with this proposal is the theory-internal conceptualization of sentence structure such as VP, raising, and empty verb, which is incompatible with a range of syntactic theories including Role and Reference Grammar. As pointed out by Van Valin & LaPolla (1997: 17–25), there is no empirical support for multi-level syntactic representation in any language and there is no universal basis for the existence of such a constituent as VP. Furthermore, Koizumi's proposal would have a problem with "lonesome numeral classifier" sentences, where the expected verb is not traceable in the clause structure due to its entire absence. While Koizumi does not include this extreme type of "surprising constituent" in his discussion, the remnant VP analysis would require a verb in the abstract underlying representation and then verb deletion to derive the surface form of the sentence, as shown in (6).

(6)   taro-no   oyatu-wa   [$_{VP}$ ringo-o   ni-ko [$_V$ e]]   da
      Taro-GEN   snack-TOP   apple-ACC 2-NC   COP
      'As for Taro's snack, (eating, etc.) two apples is adequate.'

2.2   Fukushima's lexical-semantic analysis

Unlike Koizumi, Fukushima (2003) claims a lexical semantic basis to capture the construction in the framework of the so-called "constraint-based lexicalism" (Sag & Wasow 1999). In principle, he argues that the missing "verb" is indeed missing syntactically

and it is realized only semantically. However, in terms of what is generally assumed for quantifier float, this would sound counter-intuitive because a floated quantifier is normally considered as an adverbial, i.e., an adjunct of a verb. In fact, Fukushima claims that there are two types of floated quantifiers: (i) adverbs of quantification that combine with the projection of a verb, i.e., "regular" floated quantifiers, and (ii) "lonesome quantifiers", which are nominals.

Thus, for the case of the lonesome quantifier construction, what is considered as a VP by Koizumi is a nominal projection in Fukushima's proposal. In (7), for example, *ringo-o kyoo ni-ko* "two apples today" as a whole is a nominal projection. The numeral plus classifier *ni-ko* together represent the head of the nominal projection, and the "argument" NP and the adverbial *ringo-o kyoo* "apple today" are considered as "optional adjuncts".

(7)   taro-no   oyatu-wa [ringo-o   kyoo ni-ko]-ga datoo   da
      Taro-GEN   snack-TOP apple-ACC today 2-NC-ACC adequate COP
      'As for Taro's snack, (eating, etc.) two apples for today is adequate.'

What exactly are optional adjuncts? Fukushima states "the adjuncts … behave as if they are (understood) semantic arguments/modifiers of a co-occurring predicate (if any) or of a *contextually recovered* predicate" (ibid, 330). He seems to suggest a parallel between a lonesome numeral classifier and a verb in the regular quantifier float construction in terms of the "head" status, and likewise between the optional adjuncts of a lonesome numeral classifier and arguments/modifiers of a verb in regular quantifier float.

Fukushima's claim that the missing verb is contextually recovered would make sense, as it is only the context that would identify the intended verb for a lonesome numeral classifier sentence. However, it seems peculiar to claim that the "optional adjuncts", such as *ringo-o* "apple-ACC" in (7), are only semantic, as well as to claim that lonesome numeral classifiers are nominals, as distinct from regular floated quantifiers. The obvious structural and semantic parallel between the two types of classifier construction renders the proposed lexical distinction questionable. If regular floated quantifiers are adverbial endocentric modifiers for V projections, why does it not apply to lonesome quantifiers as well, despite the fact that they require intended verbs for proper interpretations of the given sentences? Also, a crucial problem is the overt case marking on what Fukushima calls an optional adjunct (e.g., *ringo-o* "apple-ACC" in (7)), as it is puzzling to assume that the case is assigned by a NP. In fact, Fukushima somewhat downplays the role of the case marking by stating "due to the semantic incompleteness of the unusual constituents, some indications of the semantic roles of the NPs are needed to facilitate contextual recovery of an appropriate predicate meaning. Though case markers (e.g., *-ga* and *-o*) are not definitive indications of such roles, they are certainly helpful in inferring what sort of predicate would like to be relevant" (ibid, 340). Thus, in this line of argument, we would need a ground independent of a structural basis to explain why these "adjunct" NPs of a numeral classifier are case-marked.

In the present study, I propose an alternative analysis to describe the lonesome quantifier construction and attempt to capture the ambivalent property of the "missing" verb. While the absence of the verb must be captured properly, the verb must be present to allow proper macrorole assignment and case marking as well as the presence of a floated quantifier. In a RRG-based proposal, the unusual constituent may be described in a not-so-unusual manner.

3. Role and Reference Grammar approach

3.1 RRG representation of quantifier constructions

Examples given in (8)–(10) show the three major quantifier constructions in Japanese, including the prenominal and floated constructions discussed earlier. It should be noted that, unlike the prenominal construction, which contains the genitive marker preceding the head noun, the juxtaposed and float constructions exhibit some resemblance. In both types, there is no intervening genitive marking and the numeral-classifier unit follows the head noun. What distinguishes these two constructions is the case marking for the head noun; while the case marker follows the numeral classifier in the juxtaposition construction, in the float construction, the case marker immediately follows the head noun.[1]

(8) [ni-ko no ringo]-o   katta   [Prenominal]
     2-NC GEN apple ACC bought
     '(Taro) bought two apples.'

(9) [ringo ni-ko]-o   katta   [Juxtaposed]
     apple 2-NC ACC bought
     '(Taro) bought two apples.'

(10) [ringo]-o   ni-ko katta   [Float]
     apple-ACC 2-NC bought
     '(Taro) bought two apples.'

What is directly relevant to the present analysis is a case containing the copula instead of a regular verb. In fact, the copula counterparts of the three constructions given above are possible as shown in (11)–(13). The example in (13), the copula version of (10), represents the lonesome numeral classifier construction.

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1. See Amazaki (2005) for discussions of functional properties of each quantifier construction. For example, prenominal and juxtaposed quantifiers typically represent previously established sets of referents, while floated quantifiers create a new set of referents. On the other hand, juxtaposed and floated quantifiers exhibit some predicative properties, but prenominal quantifiers do not.

(11) oyatu-wa   [ni-ko no   ringo] da
       snack-TOP 2-NC GEN apple   COP
       'As for snack, (it's) two apples.'

(12) oyatu-wa   [ringo ni-ko] da
       snack-TOP apple   2-NC   COP
       'As for snack, (it's) two apples.'

(13) oyatu-wa   [ringo]-o   ni-ko da
       snack-TOP apple-ACC 2-NC COP
       'As for snack, (Taro got/will eat/etc.) two apples.'

Also, it should be noted that with the copula, the prenominal construction does not allow a case marker that follows the numeral classifier, as shown by the ungrammatical example in (14), which suggests that the juxtaposition *ringo ni-ko* "two apples" in (12) is a nominal predicate, unlike *ringo-o ni-ko* in (13).

(14) *oyatu-wa   [ringo ni-ko]-o   da
       snack-TOP apple   2-NC-ACC COP
       'As for snack, (it's) two apples.'

Logical structure and layered structure of the clause

How are the three constructions containing the copula above captured in RRG? The prenominal construction is similar to the juxtaposition because they both contain a NP predicate. The sentences in (11) and (12) represent the same logical structure such as (15), along with its NP operator projection that represents the quantifier.[2]

(15) **be′** (oyatsu, [**ringo′**])

      ⟨$_{QNT}$ (2) ⟨$_{NASP}$ (ko) ⟨ringo⟩⟩⟩

In the layered structure of the clause, the numeral classifier and the head noun form a NP under the PRED since it is a nominal predicate. The clause structure of (11) is given in Figure 1.

On the other hand, the logical structure for the lonesome numeral classifier construction represents the intended verb, though the verb is missing in the clause structure. For example, if "as for snack, Taro got two apples" is the intended reading for (13),

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2. To be precise, the logical structure here should represent the topic NP of the sentence, i.e., *oyatsu-wa* "as for the snack". This may be done with the topic that modifies the whole proposition as in the following and is coindexed with the first argument position in the case of (11) and (12).

oyatsu$_i$′ (**be′** (oyatsu$_i$, [**ringo′**]))

    The difference between the prenominal and juxtaposed constructions is captured in terms of functional values for quantifier [QNT] operator, i.e. [+established, -predicative] for prenominal, [+established, +predicative] for juxtaposition (Amazaki 2005).

SENTENCE

LDP   CLAUSE

NP   CORE

NUC

PRED   AUX

NP

oyatu-wa   ni-ko no ringo   da
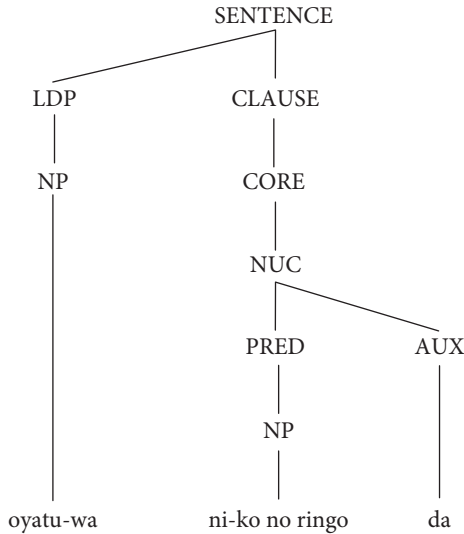
Figure 1. Clause structure of (11).

the proposition is properly represented in the logical structure, as shown in (16), so that the logical structure is properly linked with the other projections of the sentence (see the discussion on linking below).

(16) oyatu-wa   [ringo]-o ni-ko da
      snack-TOP   apple-ACC 2-NC   COP
      'As for snack, (Taro got/will eat/etc.) two apples.'

   [**do′** (Taro, Ø)] CAUSE [BECOME **have′** (Taro, ringo)]
   do′ (Taro, [**eat′** (Taro, ringo)])
   … etc.

   ⟨_QNT_ (2) ⟨_NASP_ (ko) ⟨ringo⟩⟩⟩

Figure 2 shows the clause structure of (13). Because there is no verb in the clause structure, there is no PRED node under the NUC. Instead, the NUC consists of AUX for the copula, which is linked with TNS and IF in the operator projection.[3]

Linking
If there is no verb in the layered structure of the clause, where is the missing verb besides its semantic representation in the logical structure? And how is case

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3. The floated quantifier unit *ni-ko* is not attached to anything in the clause structure because it is attached to the host NP in operator projection only. The classifier represents nominal aspect modifying at the nominal NUC level and the quantifier represents quantification modifying at the nominal CORE level.
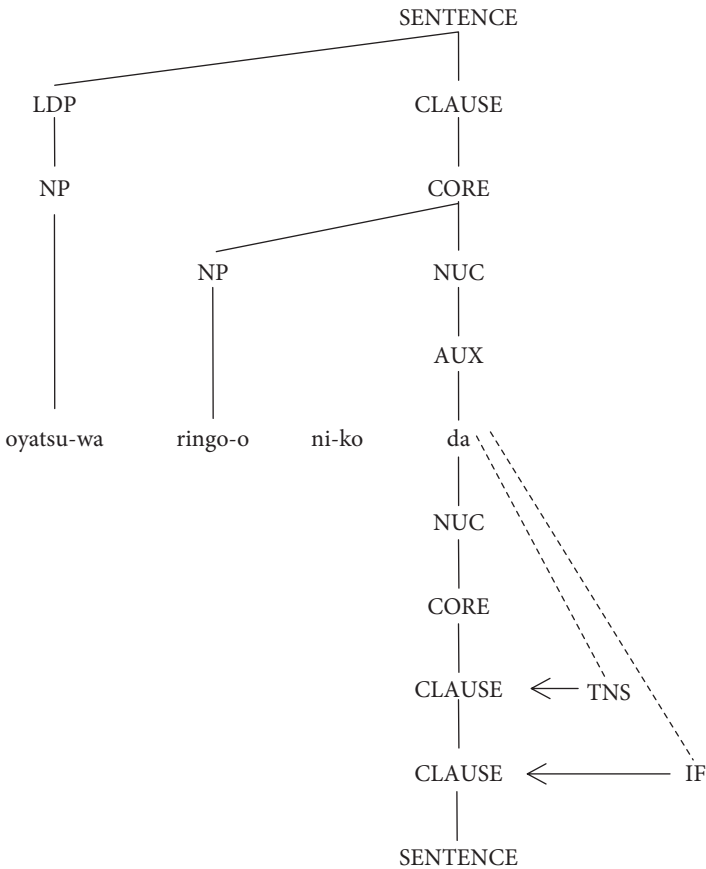
Figure 2. Clause structure of (13).

assigned to the head noun of the quantifier, i.e., the accusative argument, and other overt arguments if any? I propose that, while the verb is missing in the layered structure, it is present in the discourse representation structure, which archives information in terms of assertion and presupposition (Van Valin 2005: 170–175), as well as the logical structure of the sentence. The discourse representation and logical structure are directly linked with each other, bypassing the constituent projection, thereby enabling proper macrorole and case assignment. This direct discourse-semantics linking applies also to discourse-driven zero anaphora for arguments, as in the case of the nominative NP of (13) (also in Figure 2). More specifically, in linking from semantics to syntax, the logical structure is mapped onto the corresponding elements in the discourse representation structure for the elements missing in the clause structure. In linking from syntax to semantics, elements missing in the clause structure are retrieved by linking the corresponding elements in the discourse representation with those in the logical structure.

3.2 RRG representation of zero anaphora

Given the proposal above, a RRG overview of zero anaphora is in order. In languages such as Thai, Mandarin, and Japanese, which exhibit extensive discourse-driven zero anaphora, argument linking would face a serious problem without some sort of discourse representation in the theory, which properly captures the context dependency of a sentence. RRG assumes discourse representation structures that keep track of information in terms of pragmatic presupposition and assertion for each sentence. An example in English is given in Figure 3. As shown in the figure, each sentence has its

Mary arrived.	She saw Sam.	He kissed her.
v	w, x	y, z
Mary(v) v arrive	Mary(v) v arrive Sam(x) w = v w see x	Mary(v) v arrive Sam(x) w = v w see x y = x z = w y kiss z

Figure 3. A simple example of *discourse representation structures* (Van Valin 2005: 172).

corresponding discourse representation structure. For "She saw Sam" in the figure, for example, "Mary" is part of the presupposition discourse representation (due to the previous reference) but "Sam" and "saw Sam" are not, as these are part of the assertion discourse representation for the sentence.

In the linking representation for zero anaphora, discourse representation structures play a crucial role in the derivation of zero arguments since they are absent in the clause structure and cannot be linked with their semantic representation in the logical structure. Hence, they would fail to satisfy the Completeness Constraint (Van Valin & LaPolla 1997: 325), i.e., "all of the arguments explicitly specified in the semantic representation of a sentence must be realized syntactically in the sentence …" By linking the semantic representation with the discourse representation, arguments realized in zero form are properly represented even if they are missing in the clause structure. Consider the example from Mandarin Chinese in (17).

(17) a. Lǎo Qián$_i$ yǒu zhème ge pìqí
           Old Qian have such   CL disposition
           'Old Qian$_i$ has (just) such a disposition:

       b. pro$_i$ wèn péngyǒu$_j$ yào   shénme   dōngxi$_k$,
                ask   friend   want   what/something   thing
           if (he$_i$) asks for something from (his) friend(s),

c.   pro$_j$ lìkè   jiù   děi   gěi pro$_i$ pro$_k$
        at.once then must give
     (he/she/they$_j$) must give (it$_k$) (to him$_i$) at once.'   (Van Valin 2005: 174)

In (17c), all the arguments of the sentence are realized in zero form since the referents are part of presupposition due to the preceding context. Thus, none of the arguments are present in the clause structure of the sentence, yet the logical structure is complete
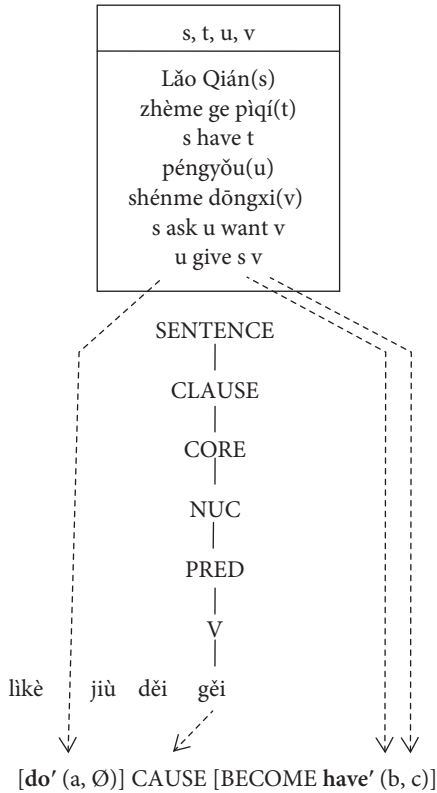
Figure 4. Direct linking from discourse representation structure to logical structure in Mandarin (Van Valin 2005: 174).

with all the arguments. In the syntax-to-semantics linking representation shown in Figure 4, all of the zero arguments are retrieved from the discourse representation structure. It should be noted that in this case, the logical structure is identified with the overt verb; hence, the verb in the clause structure is linked with the logical structure.

As discussed earlier, the unique property of the lonesome numeral classifier construction is the absence of a verb in the clause structure and therefore raises questions about the linking representation. I.e., in linking from semantics to syntax, how does the semantic representation of the verb correspond with a clause structure that lacks the corresponding verb? And in linking from syntax to semantics, how is the proper logical structure of a sentence retrieved in the first place without a verb in the clause structure?

By incorporating discourse representation structure into the linking representation, these potential problems are solved in a straightforward manner, as illustrated below.

The linking from semantics to syntax and discourse representation structure corresponds with the speaker's production of the sentence, and the representation of zero anaphora in the linking shows the process of bypassing the clause structure for referents and propositions contained in presupposition discourse representation (see Figure 5). Assuming that the discourse structure contains a presupposition such as "Taro got snack" prior to "Taro got two apples" (see Section 3.3 for pragmatic properties of lonesome numeral classifier sentences), at the point of the production of "Taro got two apples", the open proposition "Taro got X" is presupposed, including the verb; hence, both the actor argument and the verb are linked in the discourse representation, instead of the clause structure. The linking procedure relevant to Figure 5 is given below.

1. Construct the semantic representation of the sentence.
2. Determine the actor and undergoer assignments.
3. Determine the morphosyntactic coding of the arguments (i.e., selection of privileged syntactic argument and nominative and accusative case).
4. Select the syntactic templates for the sentence. Because the actor and the verb are part of presupposition, truncated syntactic templates are used.
5. Assign the argument to its position in the syntactic representation.
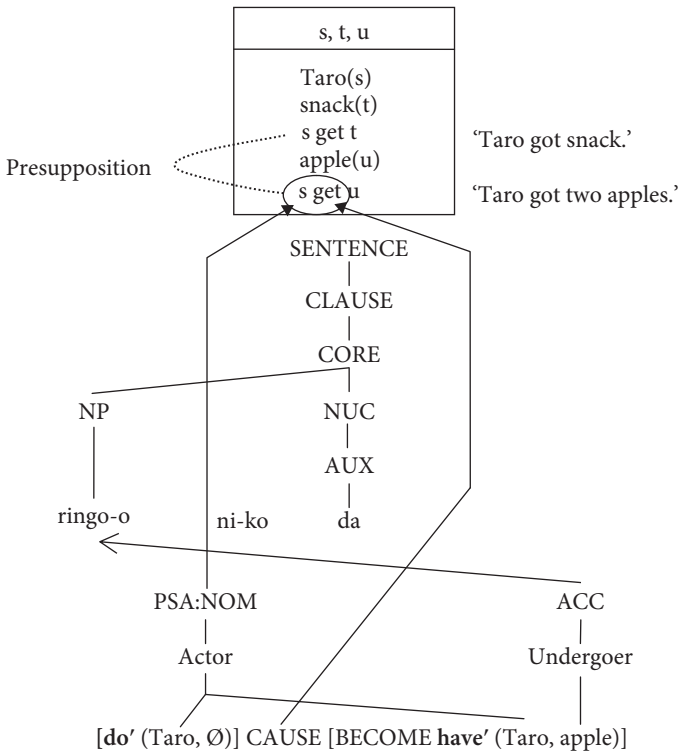
Figure 5. Linking from semantics to syntax/discourse for "(Taro got) two apples" in (13).

The representation of zero arguments and verbs given above is similar to that of the ellipsed NPs in the Mandarin Chinese example discussed earlier. In the present case, however, the verb as well as the NP argument needs to be linked directly with the discourse representation structure. From the sentence production point of view, because the intended verb is identifiable in the current discourse representation, the truncated syntactic template without the verb is appropriate for the sentence, just as in the case of NP zero anaphora.

Figure 6 shows linking from syntax and discourse representation structure to semantics for the same example. The linking process includes the retrieval of the logical structure of a verb which is retrieved from the presupposition discourse representation structure, instead of the clause structure. Likewise, the missing actor argument is retrieved from the presupposition. The linking procedure relevant to the example is given below.
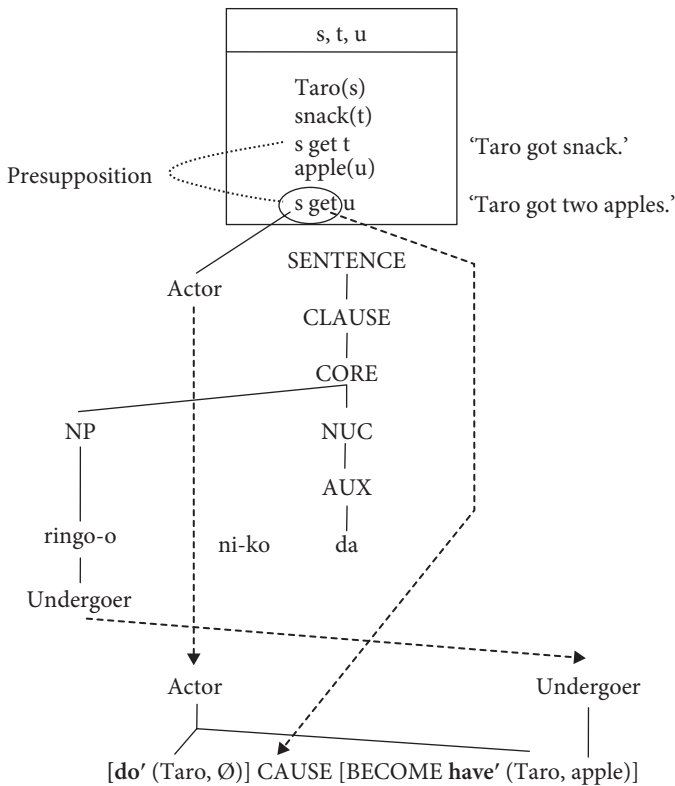
Figure 6. Linking from syntax/discourse to semantics for "(Taro got) two apples" in (13).

1. Obtain appropriate clause structure upon parsing the sentence.
2. Determine the macroroles in the clause. (Only the undergoer marked as accusative in Figure 6.)

3. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause. If the clause structure contains no predicate, retrieve it from the presupposition discourse representation structure (i.e., "X get Y").
4. Determine the actor and undergoer assignments.
5. Link the arguments determined earlier. If there are missing arguments in the clause, retrieve the corresponding arguments from the discourse representation structure.

3.3 Pragmatic properties of missing verbs

The preceding discussions assumed that there is a common property shared by zero anaphora for NPs and "missing" verbs of the lonesome numeral classifier construction that they are both contained in the presupposition discourse representation structure of a sentence. While it has been empirically shown in text analyses that zero anaphora is typically linked with "givenness" (e.g., Shimojo 2005), the pragmatic properties of the "missing" verbs in question have never been made clear. To provide an empirical support for the RRG representation proposed in the preceding sections, it is necessary to examine how the particular construction is used in discourse.

For the purpose above, the notions of givenness sorted out by Prince (1981) would be a nice starting point for discussion. While the three notions of givenness listed in (18) are not mutually exclusive, as *salient* referents may be *predictable* also, etc., it is useful to break down the notion into different aspects of givenness and pinpoint discourse tokens accordingly.

(18)　Properties of givenness (Prince 1981)
　　　a.　Predictability: Information is predictable if it can be predicted from previous discourse.
　　　b.　Saliency: Information is salient if it is expected to be in the immediate consciousness of the hearer/speaker.
　　　c.　Shared knowledge: Information represents shared knowledge if it is already known to the hearer/speaker, even if it cannot be assumed to be in the immediate consciousness of the hearer/speaker.

With Prince's characterization in mind, I examined 100 cases of lonesome numeral classifier sentences found in online BBSs and blogs using the search function available via *www.yahoo.co.jp*. The template used for the online search was "*o* [accusative marker] + numeral 1, 2, 3, 5, or 10 + numeral classifier *hon*, *mai*, *hiki*, *kappu*, *tsu*, or *ko* + *desu* [copula]". The examples were collected in the order of hits, except that only one example was taken from an online auction because this particular construction is used extensively without any prior context in this particular genre of text.

Shared knowledge
In 3 out of the 100 cases, the missing verbs represent shared knowledge exclusively. In these cases, the lonesome numeral classifier sentences are used without prior dis-

course; hence, information represented by the missing verbs is neither predictable from previous discourse nor salient in the sense of being "lit up" in the reader's attention. A representative example comes from a yahoo auction ad, which is given in (19).

(19) a. nakama-yukie-no   osyaberimezamasi-no   toosenhin
          Yukie.Nakama-GEN talking.alarm.clock-GEN prize

          ni-ko setto desu
          2-CL   set   COP

          '(It's) a two clock prize set of Nakama Yukie's talking alarm clock.'

      b. **nakama-yukie-san-no mezamasi-o   ni-ko desu**
          Ms.Yukie.Nakama-GEN alarm.clock-ACC 2-CL COP
          '(I'm selling) two of Ms. Nakama Yukie's alarm clocks.'

The auction ad consists of only two sentences given in (19). The seller initially wrote *ni-ko setto* "two (clock) set"; however, the seller gave a paraphrase in the second sentence, perhaps due to the fear that the first sentence might be misinterpreted as "two sets of clocks". Although it is obvious that the intended verb of the auction ad in (19b) is "sell", there is no prior discourse text that pinpoints the intended verb. Nevertheless, the verb is readily identifiable due to shared knowledge that an auction ad is posted to *sell* merchandise. As indicated earlier, lonesome numeral classifier sentences such as (19) are very common in auction ads.

Predictable information
In 8 out of the 100 cases, missing verbs refer to information predictable from preceding context. Unlike the case of "shared knowledge" described above, there is sufficient preceding discourse that is relevant to the intended propositions. However, the preceding discourse is not explicit enough to contain coreferential verbs, though it is enough to make the relevant propositions accessible, hence make the intended verb predictable. An example of this type is given in (20), which is from an online blog.

(20) a. minna   konsyuu-wa   nankai   makudonarudo-ni ikimasita-ka
          everyone this.week-TOP how.many.times McDonalds-to   went-Q
          'How many times did you guys go to McDonalds this week?'

      b. boku-wa imanotokoro go-kai   desu
          I-TOP   so.far   5-CL   COP
          'Me, five times so far.'

      c. **biggumakku-o go-ko desu**
          Big.Mac-ACC   5-CL COP
          '(I ate) five Big Mac's.'

In (20c), the verb is missing despite the accusative marking on "Big Mac". Nevertheless, the prior context (i.e., "going to McDonalds as a customer") evokes "eating" and makes it accessible in the discourse representation of (20c).

Salient information

The most common type in the data (89% of the total) consists of missing verbs that directly refer back to preceding coreferential verbs, typically contained in the immediately preceding sentence. Two examples are given below.

(21) a. hon-o   yomimasita
          book-ACC read
          '(I) read books.'

     b. **takemoto-nobara-san-no hon-o   ni-satu desu**
          Mr.Nobara.Takemoto-GEN book-ACC 2-CL   COP
          '(I read) two books by Mr. Nobara Takemoto.'

In (21) taken from an online blog, the intended verb "read" for (b) appears in the preceding sentence (a), by which the writer presents the simple proposition "I read books". Then, the writer expands the proposition given in (b) by indicating what (s)he read and how many books using the same propositional frame of "reading". The writer could have presented the whole proposition "I read two books by Mr. Nobara Takemoto" in a single sentence, as shown in (22). However, the proposition is presented in two parts so that the first part sets up the basic propositional frame for the important details to follow, as if the details are presented in a separate package to signal the importance for the reader/hearer. This "dynamic" two-step presentation of a proposition is a typical strategy associated with missing verbs that denote *salient* information.

(22) takemoto-nobara-san-no hon-o   ni-satu yomimasita
      Mr.Nobara.Takemoto-GEN book-ACC 2-CL   read
      '(I) read two books by Mr. Nobara Takemoto.'

The property described above is exemplified by another example given in (23).

(23) a. nikondeiru aidani tamago-o yooisimasu
          cooking   while egg-ACC prepare
          'Prepare eggs while cooking (it).'

     b. **konkai-wa   erusaizu-o   go-ko desu**
          this.time-TOP large.size-ACC 5-CL   COP
          'This time, (prepare) five large ones.'

The same two-step presentation is observed in (23). While illustrating a recipe, the writer presents the propositional frame "prepare eggs" in (23a), which is followed by elaboration to be more specific about the eggs to be used. As in the case of the previous example, the second part of the two-step presentation isolates the important details without the need of presenting the basic propositional frame at the same time.

    The result from the token counts is summarized in Table 1. The dominant givenness type of the missing verbs examined in the present data is *saliency*, though the observation also points to the fact that missing verbs may be used without preceding

Table 1. Missing verbs by givenness type

Givenness type	Tokens
Salient by preceding context	89
Predictable from preceding context	8
Shared knowledge (no preceding context)	3
Unidentifiable	0
Total	100

context, as long as the intended verb is identifiable by shared knowledge. Although it may be obvious from the discussion, it should be pointed out that propositions represented by the missing verbs were readily identifiable in all 100 cases, whether by preceding context or shared knowledge.

The findings above may be generalized in RRG terms as follows. As in the case of NP zero anaphora, the missing verb of the lonesome numeral classifier construction is associated with presupposition discourse representation structure. Furthermore, they both play a major role in optimizing the presentation of pragmatic assertion by minimizing non-focus within the potential focus domain of a sentence. Figure 7 presents
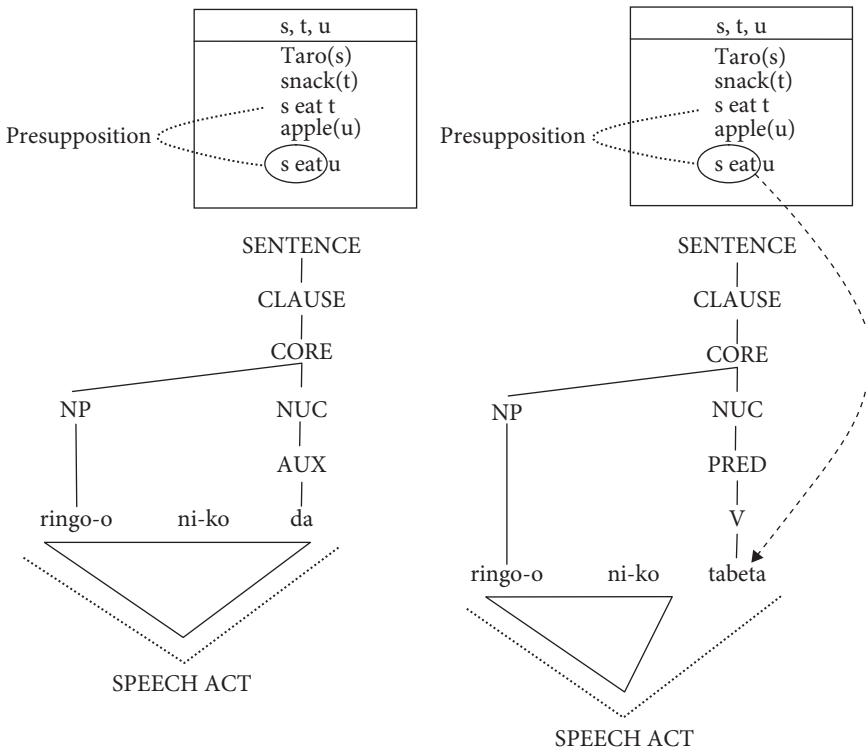
Figure 7. Focus domain with and without a "missing" verb.

two sentences for comparison, one with a missing verb and the other with an overt verb. Assuming that the verb "eat" is part of the presupposition in Figure 7, the potential focus domain of the sentence is utilized as actual focus more effectively without the overt verb since the truncated syntactic template keeps non-focus within the potential focus domain minimal. In a language such as Japanese, which favors extensive use of discourse-driven zero anaphora, the unmarked position for non-focus elements (unless it is ellipsed) is either left detached position, i.e., the leftward topic position, or right detached position, i.e., the post-verbal topic position (Shimojo 1995) – both outside the potential focus domain. Hence, given the particular discourse representation structure in Figure 7, the focus structure, the way in which presupposition and assertion are arranged in the sentence can be kept consistent with the default if the presupposed verb is absent in the clause structure.

3.4 Seeming minimal pair: Presence and absence of case marker

Before concluding the discussion, I should point out that the present study draws an interesting implication with respect to the seeming minimal pair discussed earlier, which is repeated in (24) and (25). The surface difference is the presence or absence of the accusative marking for the noun "apple". However, we saw earlier that the contrast is structural, as suggested by the English translation.

(24) oyatu-wa   [ringo ni-ko]   da
      snack-TOP   apple   2-NC   COP
      'As for snack, (it's) two apples.'

(25) oyatu-wa   [ringo]-o   ni-ko   da
      snack-TOP   apple-ACC   2-NC   COP
      'As for snack, (Taro got/will eat/etc.) two apples.'

The contrast between the nominal predicate in (24) and the missing verb in (25) suggests that the latter requires more complex linking (hence more complex processing of the sentence) than the former, due to the need to retrieve the verb that is missing in the clause structure. For comparison, Figure 8 shows the linking representation for the two sentences side-by-side. As shown in the figure, the sentence containing the missing verb requires a linking representation consisting of linking for the two macroroles, the topic, and the logical structure of the verb. The complexity is not merely in the logical structure of the verb containing two macroroles. There is an added linking process for the necessary retrieval of the logical structure (see Section 3.2: linking procedure for Figure 6).[4] But why is linking complexity associated with (25) interesting, in comparison with the juxtaposition counterpart in (24)?

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4. The complexity is not due to linking from discourse representation structure per se, since a zero form, whether missing verb or NP zero anaphora, represents non-focus, which should require a reduced processing load. But the issue here is the contrast between (24) and (25) and it is clear that the linking procedure for (25) is more complex.
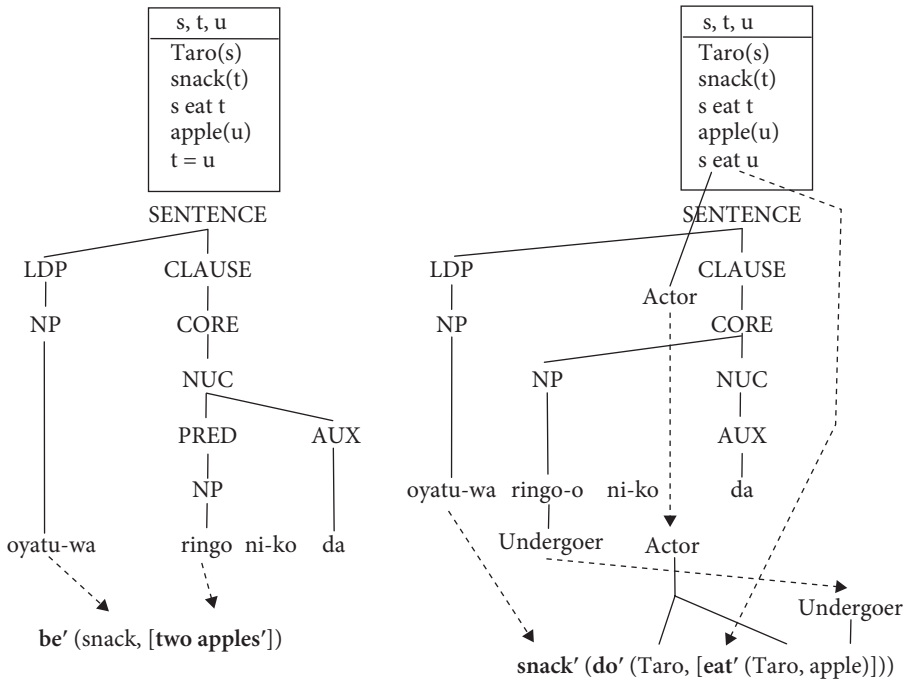
Figure 8. Comparison in linking: nominal predicate and "missing" verb.

There are discourse observations pointing to the regularity that overt case marking is associated with functional complexity. For example, Fujii & Ono (2000: 1) report that, in the informal Japanese conversation they examined, overt accusative marking is used "when the information indicated by the direct object NP is salient … or when cognitive processing requires some additional effort". Their notion of saliency refers to importance of information for the purpose of a given discourse. More specifically, they found that NPs overtly marked with the accusative marker are predominantly referential (as opposed to non-referential/generic) and represent particular types of information such as conversation topic, newsworthy items (e.g., time, place, and participants), contrasted items, and repaired part of an utterance.

Similar but more generalized observations are reported in Shimojo (2005). It has been suggested by the results from a quantitative analysis that information represented by case-marked arguments, whether nominative or accusative, is more likely to persist in the subsequent context than information represented by arguments without case marking. Furthermore, there was significantly less use of overt case marking for arguments in the post-verbal position (which is typically a non-focus position) than in the pre-verbal positions. These findings point to the marked discourse property of overt case marking as a focusing device. In terms of frequency, overt case marking exhibits marked distribution as well. Frequency counts in terms of argument forms

point to relative infrequency of morphologically marked arguments (see Table 2). The zero forms, whether zero anaphor or zero case marking, are more commonly used than overt case marking. Thus, morphologically marked arguments not only represent marked discourse functions but also are limited in distribution, at least in spoken Japanese.

Table 2. Frequency by argument/encoding type in Japanese conversation (Shimojo 2005)

	Nominative		Accusative	
Zero anaphor	2444	(.66)	318	(.46)
Zero marking	575	(.16)	241	(.35)
Overt case marking	403	(.11)	110	(.16)
Topicalized with -*wa*	270	(.07)	25	(.04)
Total	3692	(1.00)	694	(1.00)

The observed function of overt case marking as a focusing device is noteworthy in the context of the present study. The assumption relevant here is the correlation between elevated importance of information and elaboration in argument form to represent the information. Consider the two examples given below.

(26) oyatu-wa   ringo-o/Ø   ni-ko taberu
      snack-TOP   apple   2-NC   eat
      'As for snack, (I) eat two apples.'

(27) oyatu-wa   ringo-o/Ø   ni-ko da
      snack-TOP   apple   2-NC   COP
      'As for snack, (I eat/etc.) two apples/(it's) two apples.'

For regular quantifier sentences with an overt verb such as (26), the absence of the case marker does not affect the structural property of the sentence. On the other hand, quantifier sentences containing the copula such as (27) represent an extreme case in that the morphological contrast is indeed a structural contrast, since overt case marking represents not only morphological complexity but also syntactic complexity that involves a missing verb. In other words, the lonesome numeral classifier construction exemplifies a case in which morphosyntactic complexity meets functional complexity.

4. Conclusion

The construction containing a "lonesome numeral classifier" or "surprising constituent" may seem unusual due to the absence of a verb expected for the case-marked argument; however, I hope to have demonstrated in the present study that the construction does not have to be captured in an unusual manner. Our observation of

discourse suggests a common functional property of elliptical elements including the "missing" verb of the construction, as well as common zero anaphora for arguments. It then follows that a proper description of the construction requires a syntactic theory that is capable of representing the discourse-driven property of ellipsis, whether ellipsis involves an argument or a predicate. In this respect, RRG offers a proper framework, which solves the mystery of the "missing" verb by capturing the retrieval of the logical structure required for the "missing" verb as well as discourse-based linking representations for ellipsis in general. Furthermore, in addition to the proposed integration of discourse representation structure, the present proposal successfully accounts for the ambivalent property of the "missing" verb, i.e., the presence of the verb required for the proper semantic interpretation of a sentence, which is represented by the proper logical structure and complete linking representations, and the absence of the verb in the clause structure, which is represented by truncated syntactic templates.

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Predication and reference in specificational sentences

Functions of noun phrases

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In this paper, I examine the interpretation and coding of referents in English noun phrases as used in communication. The analysis is framed in terms of the identifiability, specificity and referentiality of the referent. In examining specificational constructions and the "value" and "variable" functions they contain (terms from DeClerck 1988), I show that noun phrases in specificational constructions can be incorporated into a scale which ranges from "pragmatic" to "semantic" predication, and which depends on sentential and discourse context. The relationship between reference and predication is therefore more complex than a binary alternation. Drawing on previous work in Pavey (2004), presenting these findings within a Role and Reference Grammar framework allows for both types of predication to be represented.

1. Introduction

In this paper, I take an approach to the interpretation and coding of referents in noun phrases in English that focuses on their context of use in communication. The analysis is framed in terms of the identifiability, specificity and referentiality of the referent. These terms, along with definiteness, are clarified and explained in terms of their relevance for the communicative use of noun phrases. In the light of this framework I then examine specificational constructions and the "value" and "variable" functions they contain (terms from DeClerck 1988). The analysis shows that the function of noun phrases in specificational constructions can be placed alongside other uses in a scale; these then range from "pragmatic" to "semantic" predication, and depend on sentential and discourse context. While this paper focuses on examples in English, it thus demonstrates that the relationship between reference and predication is more complex than a binary alternation. Finally, the analysis presented here within a Role and Reference Grammar framework draws on previous work in Pavey (2004) and allows for both types of predication to be represented.

2.   Definiteness, identifiability, specificity, referentiality

In this section, I examine terms that are key for this analysis, since studies in the literature often use these terms with various meanings. Table 1, at the end of this section, provides an overview of this discussion and gives examples of all the terms discussed in this section.

Essentially, the terms identifiability, specificity and referentiality relate to the cognitive status and pragmatic interpretation of noun phrases.[1] Definiteness, on the other hand, is a grammatical category connected to the expression of these cognitive statuses.

2.1   Definiteness

Following Lambrecht (1994) and Lyons (1999), definiteness is understood here as a formal grammatical category generally marked with articles. Definite noun phrases in English have definite determiners (1a), and indefinite noun phrases generally have indefinite determiners (1b).[2]

(1)   a.   the nervous guy   DEFINITE NOUN PHRASE
        b.   a nervous guy   INDEFINITE NOUN PHRASE

In the literature, definiteness is often defined in terms of the properties of the referent of the noun phrase, rather than as a grammatical marking device. Such definitions generally focus on either the existence/identifiability of the referent of the noun phrase, or on its uniqueness or "inclusiveness". Thus, Russell (1905) claims that the sentence in (2a) can be represented by three propositions, where (2b) and (c) describe the definite noun phrase (cited in Lyons 1999: 255).

(2)   a.   The King of France is bald.
        b.   There is a King of France.   EXISTENCE
        c.   There is only one King of France. UNIQUENESS
        d.   This individual is bald.

Strawson (1950) contradicts Russell by stating that definite noun phrases, such as in (2a), are generally interpreted as presupposing, rather than asserting, both the existence (2b) and the uniqueness (2c) of the referent. In terms of "existence", definite noun phrases generally code referents which are not only "existing" but identifiable (a term discussed below). Rouchota (1994) explains that while both "set up conceptual

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1.   Cognitive (or activation) status refers to the position of the referent in the hearer's consciousness. Gundel, Hedberg and Zacharski define it as indicating "information about location in memory and attention state" (1993: 274).

2.   Exceptions include mass nouns (*e.g., furniture*) and bare plurals, as in (i), which do not have determiners.

(i)   <u>Seagulls</u> sound like old women being kidnapped.

representations … definite descriptions encode the additional (procedural) information that the representations they set up are easily accessible" (1994: 452). Gundel, Hedberg & Zacharski (1993) expand this concept with their "givenness hierarchy". This connects the cognitive status the speaker assumes a referent to have in the mind of the hearer with the use of different determiners (1993: 275).

There is a concomitant sense of uniqueness or inclusivity associated with definite noun phrases: Hawkins (1978) describes them as referring to "the totality of the objects or mass within [a shared set]" (cited in Lyons 1999: 261). DeClerck (1988: 20 fn) argues that this inclusiveness is not presupposed but is an implicature available in this context as a consequence of the identifiability of the referent. He illustrates this with the example given here as (3).

(3) The one who brought in the wickets after the game left one on the pitch.

The context in (3) prevents the noun phrase *the wickets* from being interpreted as referring inclusively to everything corresponding to the description "wickets" since the sentence states that one member of the set denoted by *wickets* was left behind.

In addition, there is no exact one-to-one correspondence between identifiability and definiteness; grammatical coding can be exploited for communicative effect. Rouchota (1994: 461) provides an instance of an indefinite noun phrase used to code a referent familiar to both the speaker and the hearer (given in (4a)). The speaker uses an indefinite noun phrase to draw the hearer's attention to the description of that referent.

(4) a. <u>A convicted embezzler</u> is flirting with your sister.
     b. I'll get <u>the butler</u> to show you out. (Lyons 1999: 263)

In sentence (4b), "the locatibility of the referent … the fact that this household has a butler … may be complete news to the hearer" (Lyons 1999: 263). As Lyons notes, the success of the use of the definite noun phrase to code this "unidentifiable" referent depends upon cooperation from the hearer in "accept[ing] the definite reference as thus informing him" (1999: 263).

Thus, while identifiability is universally expressed, its expression through the grammatical category of definiteness is pragmatically conditioned and language-specific: some languages do not grammaticalize definiteness and yet express identifiability (Lambrecht 1994: 87; Lyons 1999: 278).[3] In addition, while identifiability is scalar, in as much as referents can have various degrees of cognitive status, definiteness

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3. Lambrecht (1994: 86) provides the following examples from Czech; he states that the identifiability of the noun phrase *kniha* ("book") is expressed through its syntactic position.

(i) <u>Kniha</u> je na stole. IDENTIFIABLE
     'The book is on the table.'
(ii) Na stole je <u>kniha</u>. UNIDENTIFIABLE
     'On the table (there) is a book.'
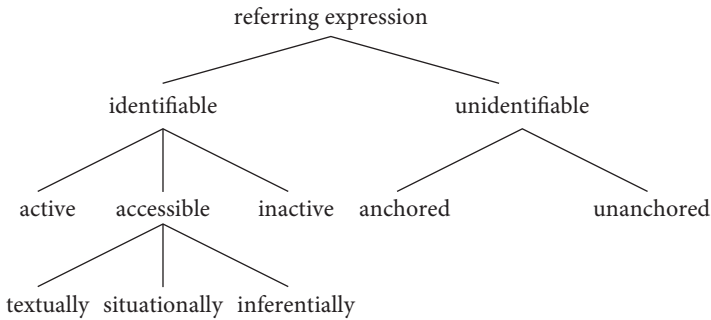
Figure 1. The cognitive states of referents in discourse (Van Valin & LaPolla 1997: 201).

is binary: referents are coded as either definite or indefinite in languages that mark this grammatically (Lambrecht 1994: 84).

2.2   Identifiability

Lambrecht credits Chafe (1976) with the use of the term *identifiable* for when "a representation exists in the addressee's mind" (Lambrecht 1994: 77). What is significant for identifiability is not familiarity or "knowledge" per se, but the ability of the hearer "to pick [the referent] out from among all those which can be designated with a particular linguistic expression and identify it as the one which the speaker has in mind" (1994: 77). This is done using both linguistic and non-linguistic contextual information. For example, a referent may be accessible to the hearer through being physically or textually present; Van Valin & LaPolla (1997) represent the levels of identifiability as in Figure 1.

Utterances can "act as a prompt" to recall experiences and construct assumptions based on a shared set of "perceptible or inferable facts" termed the "mutual cognitive environment" by Sperber and Wilson (1998: 39, 44). It follows that if a referent is identifiable in this sense; that is, if the hearer can "pick out" a unique referent that matches the description in the noun phrase, that referent can be said to carry a presupposition of existence in the discourse. It may not be the case that the hearer (or the speaker) can fully identify the referent in question, but can only associate an individual with a particular description: this is a question of referentiality, which is discussed below.

2.3   Specificity

Specificity is connected with uniqueness (also noted by Bennett 2002: 168): it concerns the question of whether the description given in the noun phrase is tied to a particular entity in the mind of the speaker.[4] Using this definition, the underlined noun phrases

4.   The term specificity is used with other senses in the literature. Gundel *et al.* (1993), for example, define specific noun phrases as those having wide-scope existential readings; that is,

in the context of sentences (5a) and (5b) below are specific, while those in (5c) and (5d) are non-specific.

(5) a. <u>The dog</u> is eating your shoe.
     b. Look, <u>a dog</u> is eating your shoe!
     c. Mary didn't get <u>a letter</u>.
     d. <u>A computer expert</u> will come to have a look.

In (5c), the speaker is not asking the hearer to construct a representation of a particular letter, merely providing a description to convey the meaning "some letter or other"; that is, something that "meets the description given" (Bennett 2002: 169). As Rouchota (1994) observes, what is relevant for a pragmatic, communication-based account in the labelling of an indefinite noun phrase as "specific" or "non-specific" is not so much that speaker has "in mind" a particular individual, but whether she is "understood [by the hearer] to have intended to communicate that she has in mind a particular individual" (1994: 455). In (5d), for example, even if the speaker has been told on the phone that the expert in question is one she is familiar with, all she intends to communicate to the hearer is that "some expert or other" (Rouchota 1994: 441) will come, which is non-specific. In other words, in terms of communicative intent, a noun phrase is specific if the hearer interprets it as signifying that the speaker has a particular single referent or set of referents in mind.

   Only unidentifiable expressions can have a non-specific interpretation. This is because if the referent who meets the description given is identifiable (and coded as definite), that entails that the hearer is already aware that a particular referent meeting the description exists; consequently the expression is inherently specific.

   The non-specific interpretation of indefinite noun phrases differs from the use of indefinite noun phrases as nominal predicates since in the former case they are "weakly referring" (DeClerck 1988: 47); they can set up discourse referents, as (6a) illustrates (from Rouchota 1994: 447).[5]

(6) a. <u>A drug addict</u>$_i$ spent the night here; he$_i$ left a syringe behind.
     b. Derek$_i$ is <u>a teacher</u>; he$_i$ lives with Pauline.

In (6b), the pronoun *he* is coreferential with *Derek*, not the nominal predicate *a teacher*.

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they can be paraphrased with a sentence beginning *There is an x who* …. However, I would argue that giving a paraphrase sentence subtly changes the context of interpretation for the noun phrase.

5.   As noted by Rouchota, the term "discourse referent" (introduced by Kartunnen 1976) is distinct from the term "referent": "a noun phrase may have a discourse referent even when it has no referent" (Rouchota 1994: 450) (that is, when it is used non-specifically).

2.4   Referentiality

The term *referentiality* as understood here is distinct from the term reference. The act of "reference" covers the function of a noun phrase in describing or denoting an entity. This definition contrasts reference with predication: a "referring expression" is one that is a semantic argument of a predicate, denoting a participant in a state of affairs (Van Valin & LaPolla 1997: 82). In this sense, all noun phrases (with the exception of grammatical "dummy" arguments and nominal predicates) are "referring expressions". They are involved in the semantic act of reference; that is, the description or denotation of a participant role in a state of affairs. However, referring expressions are not always used "referentially" in the pragmatic, communicative sense described below (a distinction also made by Gundel, Hedberg & Zacharski 1993). The examples in Table 1 below highlight this distinction.

Referentiality, on the other hand, relates to the communicative act and concerns the pragmatic interpretation of noun phrases. A specific noun phrase has a referential interpretation in an utterance if it not only "refers to an entity in the world" (Bennett 2002: 167) but if, as a result of hearing the noun phrase, the hearer and the speaker pick out, and can fully identify, the same entity in "the world" (Lyons 1999: 254). The interpretation of referring expressions as referential is therefore "a joint achievement, undertaken by the interlocutors collaboratively, and is not simply the responsibility of the speaker alone" (Cornish 1999: 20).

This process of referential interpretation is realized differently depending on the identifiability of the referent (coded as indefinite or as definite). As noted above, if the hearer cannot identify a referent through hearing an indefinite noun phrase then that noun phrase might be considered specific but is not referential (Bennett 2002: 169). The following example in (7) illustrates these different interpretations and the fact that the interpretations are context-specific.

(7)   <u>A friend of mine</u> gave this hat to me.

With a non-referential reading, the speaker is referring to a particular (specific) individual but the hearer cannot, and is not intended to, identify the identity of that individual. On the second, referential reading, the speaker is concerned with communicating information about a particular "friend" that the hearer is then expected to be able to "pick out"; indeed, the "friend" may possibly be the hearer herself (a reading noted by Rouchota (1994: 461)). To reiterate, both the referential and (specific) non-referential uses of indefinite noun phrases as defined here involve a specific, unique entity; the difference lies in whether the hearer is able to recognise the identity of the referent as a result of hearing the noun phrase.

A speaker coding a noun phrase as definite indicates that the particular referent is "identifiable" and that s/he expects the hearer to be able to retrieve an existing representation of that same specific referent. However, referentiality in definite noun phrases is complex. The noun phrase may only refer "in a weak sense" (DeClerck 1988: 47).

In other words, the full identity of the referent of a non-referential definite description may be unknown to the speaker and the description given in the noun phrase might represent "the only description that he can produce to refer to the [referent] in question" (DeClerck 1988: 47).[6] The example in (8) illustrates this non-referential interpretation of definite noun phrases: the speaker and the hearer may not be able to fully identify or name the "bank robber", although the referent is identifiable and specific.

(8)   <u>The man that robbed the bank</u> was arrested today.

The non-referential use of definite noun phrase descriptions illustrated by (8) is analogous to the non-specific, non-referential interpretation of indefinite noun phrases illustrated in (5c) and (d) (Rouchota 1994: 442; Bennett 2002: 169). In a sense, in both these uses, the description is more significant in the context than the identification of the referent that it denotes. One difference between the non-referential interpretation of definite and indefinite noun phrases is that the former are also inherently specific.

The relationship between these terms can best be explained and exemplified through Table 1 below, where the functions of the noun phrases can be read across. For example, *The dog* in *The dog is eating your shoe* is a definite, specific, and referential referring expression.

3.   Specificational constructions

With these terms clarified, I turn to the analysis of specificational sentences, such as in (9) below. Specificational constructions are a particular type of copular sentence that provide a value for a variable, functioning to provide the identity for an underspecified referent (DeClerck 1988).

(9)   a.   George is the winner. '*NP is NP*'   SPECIFICATIONAL SENTENCE
       b.   It was the curry that made me ill.   SPECIFICATIONAL *IT*-CLEFT
       c.   What I bought was a goldfish.   SPECIFICATIONAL PSEUDOCLEFT

3.1   The variable

As noted above, a definite noun phrase may be used with a non-referential or "weakly referring" sense. It may be that the description is the best that both speaker and hearer have to refer to the entity, as in (8). Alternatively, the speaker may be in a position to fully identify the individual but uses a description that is non-referential for the hearer.

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6.   This contrasts with Gundel *et al.* who state, "definite expressions are always used referentially in the sense that speakers intend to refer to a particular entity in using them" (1993: 276 fn). Their speaker-orientated definition is covered by the use of the term "specific" in this analysis.

Table 1. Classification of non-generic English noun phrases

Grammatical coding	Pragmatic interpretation		Examples	Semantic function
Definite*	Specific	Referential	**The dog** is eating your shoe.	Referring expression
		Non (or 'weakly') referential	The **previous tenant** broke it. **The bank robber** is John Brown.	
Indefinite**	Specific	Referential	Look, **a dog** is eating your shoe!	
		Non-referential	**A friend of mine** gave this hat to me.	
	Non-specific	Non-referential	**A computer expert** will come to have a look.	
			Monica is **a chef**.	Predicate

*Usually marking "identifiable" or "given" referents.
**Usuallly marking "unidentifiable" or newly introduced descriptions or referents.

This is the case in specificational sentences where the definite noun phrase or subordinate clause has the role of variable for which the speaker also provides the value. Thus, in the communicative exchange in (10), the noun phrase *the bank robber* is non-referential for speaker A; speaker B repeats this noun phrase as the shared context (the underspecified variable) onto which she or he superimposes further specificational information (as the value).

(10)   a.   A: Who is <u>the bank robber</u>?
         b.   B: <u>The bank robber</u> is John Thomas. (DeClerck 1988: 47)

Therefore, the variable in a specificational sentence (*e.g., the winner* in (9a) and *the bank robber* in (10b)) can be described as identifiable, specific and non-referential for the hearer, since the hearer cannot fully identify the particular entity that the speaker has in mind based on that description. Indeed, the very purpose of uttering a specificational sentence and the function of the value element in particular is to add the speaker's knowledge to that shared with the hearer. To reiterate, the speaker begins from the shared cognitive environment and adds specificational information that enables the hearer to make a full(er) identification of the underspecified referent. The specificational *it*-cleft example in (9b) shows that while there is a clear value-variable relation in these constructions (noted by Davidse 2000), the variable discourse referent is not always expressed syntactically as a noun phrase (see Pavey 2004: 176 for discussion).

3.2   The value

The value element in specificational sentences (*e.g., the curry* in (9b)) has significance since it is a referring expression that performs a predicative function. In specificational

constructions, the value noun phrase has the function of "saying something about" the rest of the sentence and is, in this sense, predicative. In other words, the function of a specificational construction is for the value element to add information that assists the hearer in making a full identification of the underspecified argument. This leads Lambrecht to term this value role the "pragmatic predicate" (Lambrecht 2001: 470).[7]

Thus, as well as functioning as referring expressions and semantic predicates, noun phrases may also function in a specificational or identificational role, as "pragmatic predicate" referring expressions.

(11)　It was <u>the curry</u> that made me ill.　PRAGMATIC PREDICATE/VALUE

(12)　<u>A dog</u> is eating your shoe.　REFERRING EXPRESSION

(13)　Monica is <u>a chef</u>.　NOMINAL (SEMANTIC) PREDICATE

4.　The use of noun phrases: From "semantic" to "pragmatic" predication

The result of this discussion is that a type of scale, rather than a binary relationship, emerges between reference and predication, reflected in Table 2 (an amended version of Table 1). At the top end there is the use of noun phrases as pragmatic predicates in specificational constructions describing and, most importantly in this function, denoting specific referential entities. As the "value" element in specificational sentences, the descriptions given in the noun phrase are used to assist the hearer in fully identifying a referent. At the other end are non-specific, non-referential noun phrase descriptions which are termed semantic (nominal) predicates; these provide descriptions rather than having the function of specifying the identity of an entity.

The examination presented here illustrates the relevance of sentential and discourse-pragmatic context of use for the cognitive interpretation and grammatical coding of referents in English noun phrases. In addition, noun phrases in the context of specificational constructions can be described in detail: the variable element is specific but

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7.　It is worth noting that indefinite noun phrases can have the "value" function in a specificational construction but they carry a *non*-referential, descriptive interpretation.

(i)　It is <u>a dog</u> that is eating your shoe….not a cat.

This is because specificational constructions presuppose the existence of a specific, identifiable referent and their function is to complete the identity of that entity. The use of a referential indefinite noun phrase, on the other hand, prompts the hearer to construct a "new" representation of a previously unidentifiable referent, rather than directing him/her to add the information to an existing representation. Thus, the referential use of indefinite noun phrases conflicts with the value function of a specificational construction. The indefinite noun phrase can only be interpreted as giving descriptive information about an identifiable entity. (See Pavey 2004: 164–166 for further discussion).

Table 2. Classification of non-generic English noun phrases

Grammatical coding	Pragmatic interpretation		Examples	Function
Definite*	Specific	Referential	**George** is the winner.	Pragmatic predicate
			It was **the curry** that made me ill.	
			The dog is eating your shoe.	Referring expression
		Non-referential	**The previous** tenant broke it.	
			The bank robber is John Thomas.	
Indefinite**	Specific	Referential	Look, **a dog** is eating your shoe!	
		Non-referential	**A friend of mine** gave this hat to me.	
	Non-specific	Non-referential	**A computer expert** will come to have a look.	
			Monica is **a chef.**	Semantic predicate

*Usually marking "identifiable" or "given" referents.
**Usuallly marking "unidentifiable" or newly introduced descriptions or referents.

non-referential, while the value element has a predicational role; it participates in the main communicative function of the sentence which is the identification of a referent.

5. A Role and Reference Grammar representation

Within a Role and Reference Grammar framework, the predicative nature of both semantic and pragmatic nominal predicates is captured through the similarities in the semantic and syntactic representation.

The semantic representations for the key sentences in Table 2 are as follows. Both nominal semantic predicates and referring "pragmatic predicates" are treated the same way as verbal predicates, reflecting their similar function. In each case the predicate appears in the "predicate slot", the second argument of the predicate **be'** (following Pavey (2004)).

(14) George is the winner.   PRAGMATIC PREDICATE
       be' (the winner, [George])

(15) It was the curry that made me ill. PRAGMATIC PREDICATE IN *IT*-CLEFT
       be' ([**do'** (x_i, Ø) CAUSE [BECOME **ill'** (me)], [the curry$_i$])

(16) Monica is <u>a chef</u>.   SEMANTIC PREDICATE
       be' (Monica, [**a chef'**])

```
                              SENTENCE
                                 |
                              CLAUSE
                                 |
                               CORE
                              /     \
                           NP         NUC
                            |           |
                                      PRED
                                      /  \
                                  AUX    NP
                                   |      |
                         Monica   is    a chef.
```
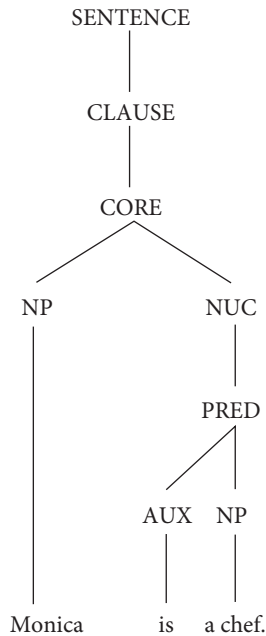
Figure 2. Nominal semantic predicate.

In terms of the syntactic structure there are also parallels. In Figure (2) we have the structure for a straightforward nominal semantic predicate. It is placed in the nucleus, as for verbal predicates, the only addition being the "aux" node that contains the copular verb.

In a specificational *it*-cleft construction, with its copular matrix clause, we see a similar representation given in Figure 3, highlighting the clefted constituent *the curry* as the element filling the nucleus within that matrix clause and modified by the peripheral cleft clause *that made me ill* (revised from Pavey (2004)).

A relevant feature of *it*-cleft constructions is that they represent a special syntactic construction in which to place the pragmatic predicate. In a sentence such as (14), on the other hand, we have a sentence with a more basic NP-is-NP form but with a specificational interpretation. It is questionable whether we would want to represent the pragmatic predicate in this sentence as the syntactic nucleus, since that would create a syntactic template not seen elsewhere in the language. In any case, the activation status of the noun phrases could be shown in the semantic representation and the broader specificational construction template could also carry details regarding information structure.

6.   Conclusion

In this paper I have shown in detail the scale of use of noun phrases from their use as descriptive semantic predicates to referring pragmatic predicates. Although the

```
                        SENTENCE
                            |
                         CLAUSE
                            |
                          CORE
                    _____/    _____
                   /                   \
                  NP                   NUC  ⟵——————  PERIPHERY
                  |                     |                |
                  |                   PRED   CLM  ⟶  CLAUSE
                  |                  /   \    |           |
                  |               AUX   NP    |         CORE
                  |                |     |     |          △
                  It    was    the   curry   that    made me ill.
```
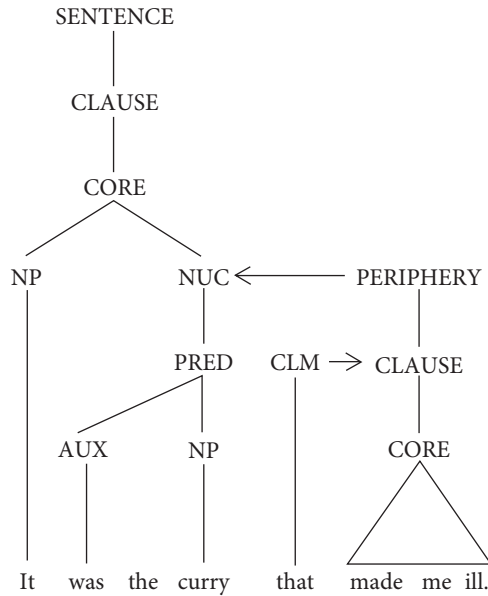
Figure 3. Specificational *it*-cleft construction.

nature of pragmatic and semantic predicate noun phrases differs, their shared predicative function is reflected in the Role and Reference Grammar representations. This representation also differentiates them from noun phrases as non-predicative referring expressions.

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The analysis of complex sentences

Alternative expressions of "want" complements*

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The complements of "want" predicate may vary depending on the identity of the main and the dependent subjects. When identical, five main tendencies are found cross-linguistically: (i) the dependent subject is omitted, (ii) the dependent subject is overtly expressed, (iii) "want" is a desiderative affix or (iv) an uninflected particle, and (v) there are alternative choices (Haspelmath 2005). Using data from the Uto-Aztecan family, this article focuses on one of the less common means, the co-existence of alternative expressions. The analysis provides an account for this phenomenon in light of the Interclausal Relations Hierarchy (Van Valin 2005): whenever there are available structures in a language, the tightest linkage encodes intention, and the less tight expresses different mental states.

1.   Introduction

In the study of complementation, it is well known that there is a correlation between the semantic structure of complement-taking predicates and the morpho-syntactic properties of their complements (cf. Givón 1980, 2001; Noonan 1985; Cristofaro 2003; Dixon & Aikhenvald 2006). Predicates like "can", "make", and "start" usually take a noun-like complement with less finite verbal morphology, i.e., limited availability of tense, aspect, modality, and agreement. Predicates like "know", "see" and "tell" generally take a sentence-like complement with finite verbal morphology, and full argument realization. Certain predicates may select more than one complement type.

Take the predicate "want" as an example. The complements of "want" may vary with respect to two major factors, the coding of the participants and the verb form. On the one hand, when the main and the dependent subjects are different, the two must be overtly expressed, e.g., *I want <u>you</u> to leave* in (1a). It should be born in mind that the notional subject of the complement may be realized in different ways, including as a pronoun or affix, a nominative or non-nominative element, or a raised or absent form. When the subjects are identical, languages vary. Some omit the dependent subject, e.g., English in (1b) and Spanish (2b). Others express it overtly, such as Otomí (3b). Even others allow more than one choice. In Obolo, subject omission is optional; the dependent subject is left implicit in (4a), but not in (4b). In Tzeltal, the dependent subject must be expressed but there are two distinguished complement: only in (5b) the aspectual marker *ya*, the verbal enclitic *-e* and the clause linkage marker *te* are present. On the other hand, because of the semantics of "want", the complement refers to an unrealized, future-oriented event, which usually appears in a special verb from, e.g., infinitival or bare form (1), (2b), and (4); potential or future (3), or subjunctive (2a). For clarity, in the example sentences, the dependent unit is enclosed in square brackets and the dependent subject is underlined.[1]

(1)   a.   *I want [<u>you</u> to leave]*.
      b.   *I do not want [to go]*

(2)   a.   *Yo quiero [que <u>tú</u> vayas]*.
      b.   *Yo no quiero [ir]*.

(3)   Otomí (Oto-Manguean; Lastra 1989: 97, 98)

      a.   *di-né*   [*<u>gi-kóh</u>   kwá*].
           1SG.PRES-want   2SG.FUT-stayhere
           'I want you to stay here.'

      b.   *di-né*   [*<u>go-kóh</u>   kwá*].
           1SG.PRES-want   1SG.FUT-stay here
           'I want (me) to stay here.'

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1.   Abbreviations: A = ergative, ACC = accusative, AG = agent, AL = alative, APL = applicative, ART = article, ATR = attributive, B = absolutive, BEN = benefactive, CIT = citative, CL = enclitic, CLM = clause linkage marker, COND = conditional, COMPL = completive, DESID = desiderative, DET = determiner, DIR = directional, DS = different subject, EST = stative, EVID = evidential, EXHRT = exhortative, EXT = extension, FUT = future, GNR = gerund, IMPF = imperfect, INC = incompletive aspect, INDF = indefinite, INF = infinitive, INT = intention, IRR = irrealis, LOC = locative, M = masculine, NEG = negative, NOM = nominative, NOML = nominalizer, NSUBJ = non-subject, NREAL = non-real, O = object, PASTC = past continuous, PL = plural, PRES = present, PL = plural, PRV = perfect, perfective, POT = potential, PTC = participial, RDP = reduplication, REM = remote, REFL = reflexive, SUBOR = subordinated, SG = singular, S = subject, SS = same subject, VBLZ = verbalizer.

(4)   Obolo (Niger-Congo; cited in Haspelmath 2005)

   a.   *m'-wèèk*   [*igêgê*   *íkpá*].
        1sg-want   inf.write   letter
        'I want to write a letter.'

   b.   *m'-wèèk*   [<u>*n*</u>*-gê*   *íkpá*].
        1sg-want   1sg-write   letter
        'I want (me) to write a letter.'

(5)   Tzeltal (Mayan; Sántiz Gómez 2006)

   a.   *ya*   *j-k'an*   [*x-tal-*<u>*on*</u>].
        icp   a1-want   icp-come-b1
        'I want (me) to come.'

   b.   *ya*   *j-k'an* [*te*   *ya*   *x-tal-*<u>*on*</u>*-e*].
        icp   a1-want   clm   icp   icp-come-b1-cl
        'I want (me) to come.'

Whereas subject omission in same-subject clauses has been widely discussed (i.e., dubbed as "equi-deletion" or "control" in the literature), the possibility of choosing among alternative structures in a language has been barely noticed. The present study explores the syntax and semantics of "want" clauses in the Uto-Aztecan family. Special attention is paid to those cases where there are alternative structures for same-subject "want" clauses. The goals are twofold. To provide data on the form and meaning of alternative "want" expressions, and to propose an analysis in light of the Interclausal Relation Hierarchy as proposed by Role and Reference Grammar (Van Valin & LaPolla 1997; Van Valin 2005). It is argued that, whenever there are available structures in a language, the tightest morpho-syntactic linkage encodes pure intention, whereas the less tight expresses different mental states and attitudes.

2.   The morpho-syntax of "want" complements

In a "want" construction, there are two clearly distinct events, the mental disposition encoded by the main predicate, and the desire expressed in the dependent unit. Based on two structural properties, that is, the coding of the dependent subject and the verb form employed for "want", Haspelmath (2005: 4) has proposed five different types of languages when expressing same-subject "want" constructions. The preference for each language's type is indicated in Table 1.

   The most common strategy is to leave the dependent subject implicit when it is identical to the main subject. When the dependent subject is overtly expressed, it generally appears as a person-number affix or a pronoun. The third most common method is when "want" shows up as a desiderative verbal affix. Significantly less common are the co-existence of two patterns in a language and the use of uninflected particles. When the subjects are different, languages usually select different complements,

Table 1. "Want" complements (Haspelmath et al. 2005)

1.	The complement subject is left implicit	144
2.	The complement subject is expressed overtly	72
3.	Both construction types exist	14
4.	"want" is expressed as a desiderative verbal affix	45
5.	"want" is expressed as an uninflected desiderative particle	8
		283

i.e., in Spanish, same-subject clauses takes an infinitival verb (2b), but different-subject clauses take a subjunctive and a clause linkage marker *que* "that" (2a).

The omission of the dependent subject when identical to the main subject has been explained by the universal functional factor of *economy* and frequency. Subject omission in same-subject constructions is "economically motivated because subject identity is significantly more likely than different subjects" (Haspelmath 1999: 3), and therefore more likely to be omitted. But subject omission is not universal. Languages such as Modern Greek, Standard Arabic, Otomí and Tzeltal show explicit coding of the subject in the complement of "want" constructions, even if identical to the subject of the main clause, motivated by the functional preference for *explicitness* (Haspelmath 1999: 2). Although plausible, it is hard to determine why this motivation works for some languages but not for others. As a unique motivation, explicitness also does not explain the co-occurrence of more than one "same-subject" construction in a language.

Based on a preliminary analysis of oral texts in four structurally different languages -Spanish, English, Nahuatl and Yaqui-, I found that 70% of the occurrences of "want" and "would like" predicates refer to same-subject clauses. The data in Table 2 then support the frequency effect proposed by Haspelmath (1999: 3): the expression of the speaker's own intentions and desires it is more common than situations involving different participants.[2]

Indeed, the predicate "want" is particularly interesting not only because languages vary the coding devices depending on the reference of the subjects, but also because the verb encodes two basic meanings. It behaves as a *psych-action* (actor control) verb when expressing the participant's mental disposition regarding a possible event involving herself, e.g., *I want to go*. It functions as a non-implicative *jussive* (undergoer control) verb when encoding the expression of a request, the speaker's strong emotion with respect to another's participant involvement in the event in question, e.g., *I want you to go*. Different-subject "want" can also be analyzed as having a propositional attitude meaning in certain

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2.   Oral text corpora: Spanish: Historia de Vida del Lonko Wenceslao Paillal (online), 12,935-words; English: Spoken English Corpus (http: //www.athel.com/cspa.html), 42,720-words; Yaqui: Pascola's texts (Buitimea, 2007), 8,586-words; Nahuatl: Nahuatl oral texts (as appeared in Peregrina, 2005).

Table 2. Oral text frequency of predicates encoding "wanting"

		Text frequency	SS	DS
Spanish	*querer, gustar*	28	21	7
(life story)	jussive verbs	8	–	8
English	*want, would like*	143	115	28
(business conversation)	jussive verbs	17	–	17
Nahuatl	*Neki*	47	36	11
(folk stories)	jussive verbs	13	–	13
Yaqui	*-bae, -pea*	95	95	–
(life story)	jussive verbs	24	–	24
		375	267	108
			(71.2%)	(28.8%)

contexts, e.g., *I want John to wash the car* is an expression of the speaker attitude, in this case a desire, toward the proposition "John was the car" (Van Valin 2005: 206). Although less frequent, the expression of wishes concerning other participants do occur in oral texts, as shown in the last column in Table 2. The low text frequency of jussive meanings may be due to pragmatic factors, i.e., it is fine to talk about our own wishes but it may be impolite to express our emotions involving others' actions.

Another factor that may be taken into consideration is the preference for statements containing first person (e.g., *I want to leave*) over non-first person (e.g., *he wants to leave*) (cf. Mithun 1999). The oral text frequency in Table 3 suggests that talking about other person's mental states is generally less frequent compared to the expression about the speaker's own wishes. The Nahuatl data were excluded since, as most folktale narratives, they are basically reported in third person. Thus, it is not only the case that the expression of our own wishes is significantly more likely, but also first person, egocentric wishes are in general more frequent.

Table 3. Verbs of volition and person marking

		Text frequency	1st	2nd	3rd
Spanish	*querer, gustar*	28	19	1	8
English	*want, (would) like*	143	94	23	26
Yaqui	*-bae, -pea*	95	55	9	31
			168	33	65

In what follows, I present the formal devices and semantic effects of "want" clauses in the Uto-Aztecan family. I first describe these languages following the universal tendencies, i.e., the expression or omission of the dependent subject, and the use of "want" as a desiderative verbal affix. The degree of syntactic tightness among the main and dependent unit is based on the overt expression of the dependent subject, the use of clause linkage markers, the operator dependency, as well as the position of the complement with respect to the main clause. The analysis contrasts same-subject and different-subject clauses.

The Uto-Aztecan linguistic family is one of the largest and most widely distributed in North America, including at least 61 languages spoken through western United States and México, divided in two mayor branches, the Northern and the Southern.[3] As family, most Uto-Aztecan languages tend to show verb-final properties, e.g., predominant use of postpositions and suffixes, and embedded complements, although word-order variations are found. When available in the language, it is common that the dependent subject in complex constructions is marked as a non-nominative argument, i.e., accusative or genitive/possessive. Besides few stems (specially, motion and posture verbs), most verbs do not show grammatical agreement, although the personal pronouns may be bound forms or clitics. The data presented here come from traditional grammars, grammatical sketches, published archives and vocabularies, and my own fieldwork.

3.   The expression of "want" clauses in the Uto-Aztecan family

3.1   The dependent subject is overtly expressed

Tohono O'odham seems to be the only Uto-Aztecan language that overtly expresses the dependent subject within same-subject "want" constructions. The predicate *taččú* "want" equally expresses volition (6a) and demand regarding another participant (6b). In both meanings, the complements are very similar. There is a clause linkage marker *m-*, the dependent subject is explicit, and the verbs are marked by the future particle *wo*. But the two complements differ in the distribution of other grammatical particles such as the presence of the citative (quote) marker *š* in the jussive function (b) but never when expressing volition.

(6)   Tohono O'odham (Langacker 1977: 167–8)

    a.   *taččú*   *a = ñ*   [*m = a = n = t*   *wo* *ñ = hii*].
        want   B = 1SG   CLM = B-1SG = PRF FUT REFL-shave:PRF
        'I want to cut my hair.'

    b.   *higi* *o* *taččú* [*m = a = n = t*   *š*   *wo* *chipk*].
        this B want CLM = B-1SG = PRF CIT FUT work:PRF
        'He wants me to work.'

3.2   The dependent subject is left implicit

The omission of the dependent subject when identical to the main participant is well attested in Hopi and Ute. The Hopi verb *naawakna* in (7) and the Ute predicate *ʾasti* in (8)

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express both the participant's mental disposition (a), and a non-implicative, weak manipulation (b). Notice that in the (a) versions, the dependent subjects are left implicit. Besides the participant coding, the complements of "want" in the two languages are embedded in the main clause, and the verbs are equally marked by a special verb form. Notice that in Ute, the dependent subject in (8b) is marked as non-nominative. However, there is a specific clause linkage marker when indicating volition, and a different one when expressing manipulation. Usually, the clause linkage marker used with different-subjects is the general subordination marker and its occurrence it is not restricted by the structure type or the semantics of the main verb. The distribution of the same-subject clause linkage markers is more limited.

(7)   Hopi (Kalectaca 1978: 170–1)

    a.   *pam   as*   [*nos-ni-qe*]   *naawakna.*
        3SG   PTCL   eat-FUT-CLM.SS   want
        'He wants to eat.'

    b.   *pam   as*   [*nu-y*   *nos-ni-qat*]   *naawakna.*
        3SG   PTCL   1SG-ACC   eat-FUT-CLM.DS   want
        'He wants me to eat.'

(8)   Ute (Givón 2001: 61–2)

    a.   *mamach*   [*tʉka-vaa-chi*]   *ʾasti-pʉga.*
        woman.S   eat-IRR-CLM.SS   want-REM
        'The woman wants to eat.'

    b.   *mamach*   [*taʾwach-i*   *tʉka-vaa-ku*]   *ʾasti-pʉga.*
        woman.S   man.O   eat-IRR-CLM.DS   want-REM
        'The woman wants the man to eat.'

3.3   The expression of "want" as a verbal affix

The preferred tendency among the Uto-Aztecan languages is the use of desiderative verbal affixes. When the expression of volition turns up in a co-lexicalized structure, i.e., the main and the dependent verb are morphologically adjacent, two properties are relevant: whether there is one or two lexical forms expressing wanting, and whether the two verbal units share the notional subject, i.e., subject omission. Generally, the two meanings of "want" are expressed by the same lexical predicate, e.g., *querer* in Spanish, *kʾan* in Tzeltal, *ʾasti* in Ute. But this is not always the case. In the Southern Uto-Aztecan languages, the lexical verb may also depend on the identity of the subjects. The expression of volition usually comes up as a verbal affix, whereas the jussive function occurs as a main predicate taking a complement. In Cora, the verbal suffix *-iku* (historically related to "die.PL") is the only way to express the speaker's volition and desire (9a), while the full verb *šeʾeveʾe* acts as jussive predicate (9b).

(9)   Cora (Casad 1984: 348, 398)

    a.   *ṯ-á'-u-kiiny-iku.*
           1PL-far-COMPL-walk-DESID.PL
           'We want to go.'

    b.   *ka-nú   yéewi   čé'e   ra-še'eve'e*   [*peh   yá*
           NEG-1SG quote   cont   dist:SG-want   2SG:SUB   there

           wa-tá-ka-t^{y}i   n^{y}i-céh].
           COMPL-PRF-be-NREAL my-house

           'I don't want you to stay in my house.'

    The question whether the dependent subject is implicit or not does not arise within a co-lexicalized structure, because there is no complement clause (Haspelmath 2005: 3). In other words, since the two notional verbs build a complex but single predicate, it is likely that the dependent subject is omitted. This maximum expression of economy is attested in Cora and Guarijio in (10) below, as well as Southern Tepehuan, Mayo and Yaqui.

(10)   Guarijío (Miller 1993: 97)

    a.   *pa'á=ni   simi-náre ihtiénda-ci pi'arí.*
           already=1SG go-DESID   store-LOC   early
           'I want to go to the store early.'

    b.   *nahki-ná=niga   [amó   tehíba-mi-o   i'wá*].
           want-PRES=1SG   2SG.NS   stay-FUT-CLM there
           'I want you to stay there.'

Nevertheless, the omission of the dependent subject in this structure type is not universal. In Huichol, the verbal suffix *-keyu* may or not omit its dependent subject; contrast the clauses in (11a) and (11b) below; in both instances, the pronominal subject is nominative. The expression of the dependent subject is also optional in Northern Tepehuan (11c), but obligatory in Cupeño (11d); notice that the bound pronoun in the verbal predicate is marked accusative.

(11)   Huichol (Gómez 1999: 130)

    a.   *ke-pe-ti-yurie-ni-keyu.*
           int-2SG.S-INT-do-FUT-DESID
           'What do you want to do?'

    b.   *'ena   ne-pɨ-ne-hayewa-keyu.*
           here   1SG: S-ASI-1SG.S-stay-DESID
           'I want to stay here.'

    Northern Tepehuan (Bascom 1982: 282)

    c.   [*imí=á=iñ*]   *ágai-tadai (áánɨ).*
           go=B=1SG   desid-pastc 1SG
           'I wanted/intended to go.'

Cupeño (Langacker 1977: 149)

d. _ne'e=n_   _pi-čak-ne-n-viču-qal._
    1sg.nom=1sg this-take-1sg-acc-want-pasdur
    'I wanted to take it.'

It may be also the case that both meanings make use of verbal affixes, one bound form encoding volition, and another bound form expressing the speaker's request on another participant. For Nevome in (12), there are _-mut'_ and _-orida_ for same and different subjects, respectively. In Yaqui, there is _-pea/-bae_ and _-'ii'aa_, the latter related the speech act predicate "to say".

(12)   Nevome (Shaul 1982: 81, 133)

   a.   _a-si-mu-gugba-mut'-an'-igui_
        2pl-est-2pl-hit-want-1sg-irr
        'I want to hit you (pl).'

   b.   _mumu_   _an'-igui_ _cauari s'-haquiard'-orida._
        2sg   1sg-irr eggs   est-count-want
        'I want you to count the eggs'

(13)   Yaqui (Guerrero 2006: 113)

   a.   _Ne_   _kaa polisia-ta_   _tomi-ta_   _mak-bae-k._
        1sg:nom   neg policeman-acc money-acc give-desid-prf
        'I didn't want to give money to the policeman.'

   b.   _Ne_   _kaa enchi_   _polisia-ta tomi-ta_   _mak-'ii'aa-k._
        1sg:nom   neg 2sg.acc police-acc money-acc give-want-prf
        'I didn't want you to give money to the policeman.'

The morpho-syntactic properties described so far, follow the main tendencies found cross-linguistically, i.e., several Uto-Aztecan languages omit the dependent subject when identical to the main subject; many express the notion of wanting by means of verbal affixes. The next section presents cases where there is more than one same-subject "want" expression, one clause morphologically more complex than the other, and each structure highlighting specific semantic notions.

4.   Alternative expressions of "want" clauses

We have seen examples where the notion of wanting is encoded by a verbal affix, especially when involving identical participants. Languages may vary even when using the same structure type. In Yaqui, the verbal affix _-bae_ expresses volition (13a), but the reduplicated form _-babae_ systematically encodes a stronger emotion on the part of the speaker (14). The point here is that there are two formal expressions involving the notion of wanting and identical subjects, the short form _-bae_ expresses the basic

meaning of volition, while the long form *-babae* encodes a related but slightly more complex semantic situation, i.e., decision, planning, and strong emotion.

(14)   Yaqui (Buitimea 2007)

    a.   *bweta jiba juni nee   ania-babae-k.*
        but   now then 1SG.ACC help-RED.DESID-PRF
        'But at the end, they decided to help me.'

    b.   *Junak bea <u>ne</u>   aman-bichaa wee-babae-k.*
        then   thus 1SG.NOM there-toward go-RED.DESID-PRF
        'And then, I decided to go there.'

In Nahuatl, there are two choices for same-subject "want" clauses: the co-lexicalized type expresses volition, and the reduced complement clause encodes inception/strong desire. When expressing volition, the predicate *neki* may be attached to the dependent verb (15a) or it can take a complement (15b). In the former, the dependent subject is omitted; in the later, it is overtly expressed. In both cases, the verb takes the future/irrealis suffix -s. The author refers to a meaning change between the tightest linkage in (a) and the less tight structure in (b): only the latter additionally encodes the participant's attitude (even motion) to realize the intended event, e.g., "*I really, I am going to sleep*". When expressing the participant's weak manipulation over another participant, the only possibility is the complement in (15c) introduced by the clause linkage marker *ma*.

(15)   Tetelcingo Nahuatl (Tuggy 1979: 108–9)

    a.   <u>*ni*</u>-*koči-s-neki.*
        1SG-sleep-FUT-DESID
        'I want to sleep.'

    b.   <u>*ni*</u>-*k-neki*   [<u>*ni*</u>-*koči-s*].
        1SG-3SG.O-want   1SG-sleep-FUT
        'I want, I am going to sleep.'

    c.   *k-neki*   [*ma*   <u>*ni*</u>-*ya*].
        3SG.O-want   EXHRT 1SG-go
        'He wants me to leave.'

What is more, it seems there are some dialectal preferences on the expression of volition. In Amanalco Nahuatl, the most common way to encode the speaker's own desires is when the predicate *neki* is combined with the reduced complement in (16a). The co-lexicalized structure in (16b) is used to highlight a stronger, controlled, even awful desire, e.g., "*to pee on someone*".

(16)   Amanalco Nahuatl (Peralta 2006; p.c.)

    a.   *a'mo* <u>*ni*</u>-*h-neki*   [<u>*ni*</u>-*tla'tlami: na-s*].
        NEG   1SG-3O-want   1SG-urinate-IRR
        'I don't want to urinate.'

    b.   *ni-tla' tlami:na-s-neki.*
           1SG-   urinate-IRR-want
           'I want to urinate.' (e.g., bad intention)

The alternative expressions may also include the combination of two morphological means into the same clause. In Northern Paiute, the verbal affix *su-* indicates volition (17a) but so does the full verb *sunami* (17b). Notice, however, that the embedded verb in (b) also has the desiderative prefix *su-*, i.e., there is a double coding of "wanting". A change of meaning is again reported: whereas the former encodes an internal desire, the latter emphasizes the participant's decision, inception and willingness to realize the event coded in the complement.

(17)   Northern Paiute (Snapp & Anderson 1982: 77–78)

    a.   *umɨ ka nobi-kwai-tu   su-kimmau.*
           3PL ACC house-LOC-toward want-come
           'They want to come to the house.'

    b.   *nɨ [mɨ tigapu odɨ tu'i su-ĵagʷi] sunami.*
           1SG PL rope long try want-make want
           'I decided to make these ropes longer." (lit. want try-want-make).'

A more complex pattern is reported in Raramuri (Tarahumara) where three alternative expressions co-exist. There is one structure taking the verbal affix *-nare* (18a), another structure involving the full verb *naki* (18b), and a third structure combining the two, the verbal affix and the main verb in the same clause (18c). The double coding of wanting gives emphasis not only to the expression of a desire, but also the participant's commitment and attitude regarding a state of affairs in which he/she is involved, e.g., *I have the feeling, the strong intention of going.*

(18)   Raramuri (Brambila 1953: 168)

    a.   *we ne   šimi-nare.*
           a lot 1SG.NOM go.SG-want
           'I want to go.'

    b.   *we ne   naki [šimi-ga].*
           a lot 1SG.NOM   want go.SG-GER
           'I want to go (I have the intention of going).'

    c.   *we ne   naki [šimi-nare].*
           a lot 1SG.NOM want go.SG-want
           'I really want to go/I have the strong desire to go.'

What these languages (or speakers) are trying to encode when selecting alternative structures to express the notion of wanting, is to indicate that the participant is more or less strongly committed to the likelihood of the state of the affairs to being realized. This phenomenon is even clearer when the semantic notions covered by the predicate go from volition and emotions, to opinion, and to cognition. In the Tepiman

languages there is not a unique word meaning "want". Depending on the morpho-syntactic properties of the complement, the same lexical form acts as a psych-action, propositional attitude and cognitive predicate. In Northern Tepehuan, the full verb *ilídⁱi* serves double duty: it expresses the participant's desires (19a) as well as her/his attitude regarding the content of the complement (19b). Only in the cognitive reading (b), the dependent unit is formally introduced by the clause linkage marker *iš*, the verb expresses all its arguments, and it is independent in term of operator marking. The position of the linked unit also differs for each semantic reading.

(19)   Northern Tepehuan (Bascom 1982: 282, 350)

    a.   *ka = kilí-tʸu*   <u>*ááni*</u>   [*ka=óóñ-tʸa*]   <u>*iñ-ilídⁱi*</u>.
            already=man=become   1SG.S   already=wife-CAUSE   1SG.NS-want
            'Now that I am a man, I want to get married.'

    b.   [*kɯgádo*]   *ilídyi*   <u>*ááni*</u>   [*iš = gi-oohí-dya-gi*].
            good   want   1SG   CLM=2SG-write-APPL-IRR
            'I thought it would be good to write you.'

The Tepiman languages are also special in the sense that the dependent subject is raised, and hence marked as a non-nominative argument within the main clause. The clause in (19a) would literally mean "*now that I am a man, it is my pleasure to get married*". The last set of examples belongs to Pima Bajo, where the predicate *ilid* equally encodes volition (20a), remembering (20b–c) and thinking (20d). Again, whereas the most basic sense is expressed in the less finite complement, i.e., the dependent unit in (a) is embedded and the verb is limited to the potential suffix *-ia*, the meanings get complex as soon as the complement acquires more finite properties. From (b) to (d), the subjects can be different, the dependent unit is now extraposed to the right, and the verb may take the relevant operators, e.g., evidential, probability and even perfective markers. Only in the cognitive reading "to think" is the complement formally introduced by the clause linkage marker *ko*.

(20)   Pima Bajo (Estrada 1998: 87–90)

    a.   <u>*aan*</u>   [*iʼa*   *voʼo-ia*]   <u>*in*</u>   *ilid.*
            1SG.S   here   stay-POT   1SG.NS   want
            'I want to stay here (lit. my staying here is my pleasure).'

    b.   <u>*aan*</u>   *im*   <u>*in*</u>   *ilid*   [*puertat*   *kuupa-it*].
            1SG.S   NEG   1SG.NS   think:IMPF   door   close-EVID
            'I didn't remember to close the door.' (LIT. I did not think myself)

    c.   <u>*aan*</u>   *im*   <u>*in*</u>   *ilid*   [<u>*api*</u>   *ab*   *duvia*].
            1SG.S   NEG   1SG.NS   think:IMPF   2SG.S   DIR   come:PROB
            'I didn't remember that you would arrive.'

    d.   <u>*ani*</u>   <u>*in*</u>   *ilid*   [*ko-va*   <u>*higai*</u>   *huaan-viin*   *hiim*].
            1SG.S   1SG.NS   think:IMPF   CLM-COMPL   3SG.S   Juan-COM   go:PRF
            'I think that he went with Juan.'

In sum, individual languages may make use of universally-available coding devices in different ways. Although this paradoxical data may be too few to question the pertinence of economy, frequency and explicitness as the crucial motivations, they are too salient to be neglected and ask for a reasonable explanation.

5.   The analysis of "want" clauses in the light of the Interclausal Relations Hierarchy

Without denying the relevance of economy as an explanation for the three most common strategies found in the expression of same-subject "want" clauses, the occurrence of alternative expressions in the same language may be motivated by either one of the following two principles: extravagance and iconicity.

Extravagance, as proposed by Haspelmath (1999b: 1043) is the "speaker's use of unusually explicit formulations in order to attract attention." In the lines of frequency and economy, when a novel and extravagant form is adopted widely by the speech community, it usually becomes more frequent and, consequently, the novel form is reduced in its phonological or morphological shape. Without doubt, the Uto-Aztecan patterns described above are unusual and novel formulations originally chosen by speakers in certain contexts. But, still the question arises in how to establish the basis for such motivation, i.e., what part is extravagant? The structure? The resulting meaning? The context? All of these?

We have seen a variety of functional effects in all cases of alternative expression: the meanings encoded in the innovative structures are more or less constant. From the participant's willingness or intention in cases where the focus is upon a future event that is planned, threatened, to the predictability and attitude towards the realization of the event in question, in cases where the focus is upon the participant's mind. These functional effects make possible another explanation: iconicity.[4] Iconicity is understood not as a one-to-one relationship between the syntactic and semantic representations of a sentence (cf. Silverstein 1976; Givón 1980; Haiman 1985), but as a functional motivation organizing the form and meaning dimensions together in a scale of clause union, as does the Interclausal Relations Hierarchy (IRH) proposed by Role and Reference Grammar (Van Valin & LaPolla 1997; Van Valin 2005). Although there might be mismatches among the linkage of the two representations in particular languages, the IRH represents general constraints on the way natural language is structured: it narrows down the possible range of form-meaning correspondences and rejects unlikely ones (see Ohori 2005).

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4.   Haspelmath (1999a, 2005) also argues against iconicity as a motivation, and provides a detailed argumentation in favor of frequency in explaining grammatical asymmetries.

When establishing the different degrees of tightness in clause linkages, the omission of the dependent subject is, perhaps, the first property in defining a higher syntactic integration. But we have seen that the degree of finiteness is also due by operator dependency, the use of clause linkage markers, and the position and status of the dependent unit. The establishment of the degree of the semantic cohesion among the units is slightly more complex, though. For this, I adopt Van Valin's proposal regarding the semantic integration as the result of the interaction of a set of sub-hierarchies, including but not limited those listed below:

(21)   Semantic sub-hierarchies (Van Valin 2005: 211)

   a.   *Temporal hierarchy*: phases of a single event > simultaneous events > sequential events > unspecified

   b.   *Causal hierarchy*: physical > verbal > underspecified $_{[non-defeasible]}$ > inferred $_{[defeasible]}$

   c.   *Necessarily shared participant [NSP]*: Yes > No

   d.   *Participant's mental disposition*: intention > perception > belief > knowledge

For "want" complements, the temporal hierarchy (a) is irrelevant since the meanings of "want" necessarily involve a sequential relationship among the two events, as it always includes an unrealized, future-intended event. The causal hierarchy (b) is relevant only in the jussive reading, e.g., the clause *I want you to stay* implies some sort of causality, but *I want to go* does not. The hierarchy in (c) simply says that two events which necessarily share a participant are more closely linked than two verbs which not. This is true for the two interpretations of "want": the actor is the shared argument when encoding volition, while the undergoer is the shared argument in a jussive interpretation. The mental disposition hierarchy concerns what kind of cognitive stance a participant is in. For "want" predicates, the participant is acting according to her/his own intentions. As is, the interaction of the semantic sub-hierarchies in (21) are able to establish the form-function correlation between same-subject and different-subject "want" clauses only, but not to distinguish among the different senses of the same-subject expressions.

Compared to the others, the participant's mental disposition hierarchy is the most complex and heterogeneous. It originally denotes the experiencer's intention to be involved in a state of affairs, perception, and different stages of cognition. Because it is closely correlated with the semantic features of the predicate expressing the main state of affairs, it furthermore reflects some sort of inherent epistemic scale in the language, in that the values refer to somebody's commitment towards the truth of some proposition being expressed. In view of that, we may re-formulate this hierarchy as a cognitive scale involving different aspects including but not limited to (i) intended event on the part of the speaker, (ii) experiences generated in the speaker's mind (e.g., internal/mental perceived phenomena vs. external/mental phenomena), and (iii) the speaker's measure of subjectivity (e.g., judgment, reasoning, report). The revised version is illustrated below:

(22)   *Participant's mental disposition* (Guerrero 2006: 219)
      Intention > internal/direct experience > mental experience: judgment >
      mental experience: reasoning > non-mental experience: report

The first two values are relevant for "want" complements. Whereas "intention" conveys the participant's own conceptualization of volitional preferences, wishes and desires encoded in the complement, the second value seeks to account for different kinds of mental stances on the part of the participant. That is, "internal/direct experience" indicates the state of affairs was internally generated in the participant's mind, a mental concept formed by internal, physical, direct contact with another entity and/or event. The proposal is the following: whenever there are available structures in a language, the tightest linkage would encode pure intention, whereas the less tight may express a particular mental stance, i.e., decision in Yaqui, emotions values in Nahuatl, inception and strong desires in Raramuri. One more argument in favor of a mental disposition distinction is the fact that "want" can serve "double duty" expressing volition, propositional attitude and even cognition, as in the Tepiman languages.

6.   Concluding remarks

The notion of "wanting" not only has different morpho-syntactic expressions across languages, but also within a language. Using data from the Uto-Aztecan family, we saw cases following the universal tendencies regarding the omission or overt expression of the dependent subject, and the use of desiderative affixes. However, we also found several instances of alternative same-subject expressions in a language. The interesting results are that language-specific constructions moving away from the universal tendencies predictions, reflect a slightly more complex mental experience on the part of the participant: a conscious, internal desire reflecting attitude or emotions regarding the intended state of affairs on the part of the participant.

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An RRG approach to French complementation patterns

Some operator constraints on the logical structure*

Takahiro Morita

The aim of this paper is, in the framework of RRG (Van Valin & La Polla 1997; Van Valin 2005), to propose some operator constraints on the logical structure of complement taking predicates in French, in particular the class of propositional attitude (BELIEVE class, *croire*) and that of volition (WANT class, *vouloir*). To approach the complementation patterns of these classes requires the treatment of the different syntactic structures (infinitival core coordination/ clause subordination) and modal opposition (indicative/subjunctive) in a unifying way. The present paper argues that specification of the operators in the logical structure allows the prediction of the correct syntactic structures and the appropriate selection of mood to each class of verbs.

1.   Introduction

Among French complement taking predicates, the verbs of propositional attitude (BELIEVE class) and those of volition (WANT class) take three complementation patterns depending on the syntactic structure and modal inflection of the subordinate clause: infinitival clause, indicative clause, and subjunctive clause.

        Infinitival Clause
(1) a. Je crois pouvoir dire   ceci en toute certitude.
        I think can.INF say.INF it   in all   certitude
        'I think that I can say that with certainty'

      b. Je veux partir   en vacances.
        I want leave.INF for vacation
        'I want to leave for vacation'

Indicative Clause

c. Je crois que je peux   dire   ceci en toute certitude
    I   think CLM I   can.IND say.INF it   in all   certitude
    'I think that I can say that with certainty'

Subjunctive Clause

d. Je veux qu'il   puisse partir   en vacances.
    I   want CLM-he can.SUB leave.INF for vacation.
    'I want that he could leave for vacation'

It is easily noticeable that the infinitival clauses (1a) and (1b) are syntactically distinct from the others because they are directly connected to the main clause without any clause linkage marker. Contrary to that, the indicative clause (1c) and the subjunctive clause (1d) have an overt clause linkage marker *que* and an independent subject. In terms of the nexus relation and the juncture level in RRG (Van Valin & La Polla 1997; Van Valin 2005), the infinitival clause constitutes a core coordination structure, and the subjunctive and the indicative clauses construct an asymmetrical relation between the core and the clausal subordinate.

(2) a. [Je crois]$_{CORE}$ [pouvoir dire ceci en toute certitude]$_{CORE}$
     b. [Je veux]$_{CORE}$ [partir en vacances]$_{CORE}$
     c. [Je crois]$_{CORE}$ [que]$_{CLM}$ [je peux dire ceci en toute certitude]$_{CLAUSE}$
     d. [Je veux]$_{CORE}$ [qu']$_{CLM}$ [il puisse partir en vacances]$_{CLAUSE}$

Thus, these different syntactic structures can be represented by the nexus relation and the juncture level, which do not account for the modal opposition between the indicative and the subjunctive because they have the same syntactic structure as shown in (2c) and (2d). Therefore, these complementation patterns must be stated not only in terms of the syntactic difference between the infinitival core coordination and the clausal subordination, but also in terms of the modal opposition between the indicative and the subjunctive.

The aim of this paper is to propose some operator constraints on the logical structure of these classes of verbs by which (i) a proper syntactic structure can be projected to each type of complementation, and (ii) the modal opposition is correctly reflected. It will be shown that in the framework of RRG, projection of the correct syntactic structure and selection of mood can be integrated in terms of the operator constraints on the logical structure.

This paper contains the following sections: section 2.1 and 2.2 are devoted to elaboration of the logical structures of two classes of verbs: the BELIEVE class (*croire*) and the WANT class (*vouloir*). In section 2.3, the discussion will extend to some related issues such as the relevance of the focus structure to the complementation patterns and transparency of external negation that may influence the mood in the subordinate clause. Finally, some applications of our approach will be proposed to other complement taking verbs which appear in similar constructions such as in the BELIEVE class and the WANT class.

2.   Analyses

In complex sentences, there are either symmetric or asymmetric relations between clauses. These relations pertain not only to the syntactic structure, but also to the operator projection. The first step of our approach is to identify the maximal operator projection on the coordinated core and on the clausal subordinate, which allows the determination of the syntactic structure to be projected. In the second step, it is necessary to specify other operators in the logical structure in order to account for the modal opposition. Our approach will be extended to the interface between the complementation patterns and information structure; it will be shown that selection of the complementation pattern is pragmatically motivated.

2.1   Infinitival core and clausal subordination

The starting point of our discussion is the syntactic distinction between the infinitival core and the clausal subordination after verbs of the BELIEVE class such as *croire* (think, believe). This syntactic distinction can be represented in terms not only of the nexus relation or the juncture level, but also of the operator constraints on their logical structure.

2.1.1   *LS of BELIEVE class*
Ohori (2001) proposed the formalization of interclausal semantic relations going from the closest causative relation, where one state of affairs is brought about directly by another state of affairs, to the loosest situation-situation relation in which the temporal relation of two events is not marked overtly. In accordance with this scale, the following LS is given for the propositional attitude relation.[1]

(3)   **BELIEVE′** ((x), [LS])

Our object of analysis, *croire*, is a French propositional attitude verb to which this schematic LS is applicable. When the LS (3) is applied to sentence (4), the resulting description will be represented as in (5).

(4)   Je crois que je comprends   ce que tu   veux dire.
      I   think CLM I   understand.IND it   that you want say
      'I think that I understand what you mean.'

(5)   **believe′** (je, [**understand′** (je, ce que tu veux dire)])

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1.   Capital terms (WANT', BELIEVE') designate the class of words or predicates, and lowercase terms (want', believe') represent verb meaning. In this paper, capital terms are used for a generalization of the class, and lowercase terms are used for the analysis of each predicate.

However, the verb *croire* presents one particularity according to which, when the subjects are identical in the first and the second clauses, alternation is possible between clausal subordination and infinitival core coordination.

(6) Je crois comprendre   ce que tu   veux dire.
     I   think understand.ɪɴꜰ it that you want say

The LS of example (6) is the same as that of (4). That is to say, the LS in (5) may project two types of syntactic structures: one is the clausal subordination corresponding to (4), and the other is the infinitival core coordination in (6). The LS in (5) cannot distinguish one syntactic structure from the other because the semantic relation is identical for these two sentences. It requires further elaboration in order to project each syntactic structure separately.

 Generally, the indicative and the infinitive are distinguished from each other in terms of tense and person inflection. The indicative is a verb form inflected for grammatical subject and tense, while the infinitive does not represent them. A series of tense shifting tests proves this difference.

(7) a. Je crois   que je l'ai   déjà   vu.
         I   think.ᴘʀᴇs ᴄʟᴍ I 3sɢ.ᴀᴄᴄ-ᴀᴜx.ᴘsᴛ.ᴘꜰᴛ.ɪɴᴅ already see.ᴘᴘ
         'I think that I have already seen that.'

     b. Je croyais   que je l'avais   déjà   vu.
         I   think.ᴘsᴛ.ɪᴍᴘ ᴄʟᴍ I 3sɢ.ᴀᴄᴄ-ᴀᴜx.ᴘʟᴜᴘ.ɪɴᴅ already see.ᴘᴘ
         'I thought that I had already seen that.'

     c. Je crois   l'avoir   déjà   vu.
         I   think.ᴘʀᴇs 3sɢ.ᴀᴄᴄ-ᴀᴜx.ᴘꜰᴛ.ɪɴꜰ already see.ᴘᴘ

     d. Je croyais   l'avoir   déjà   vu.
         I   think.ᴘsᴛ.ɪᴍᴘ 3sɢ.ᴀᴄᴄ-ᴀᴜx.ᴘꜰᴛ.ɪɴꜰ already see.ᴘᴘ

Example (7a) shows that the verb *voir* (see) in the subordinate clause is shifted for the past perfect, independently of the main verb *croire*, which remains in the present tense. The sentences in (7b)–(7d) are examples of concordance; when the main verb is shifted from present tense (7a) to past (7b), the verb in the subordinate clause comes to take the form of the pluperfect past, whereas this tense cannot appear in the infinitival clauses in (7c) and (7d). In the last two sentences, the combination of an auxiliary and a past participle represents only perfective aspect. Hence, the indicative mood has its own tense and person inflection, while the infinitive does not express them.

2.1.2 *Operators*

Consequently, the clausal subordinate requires the tense operator independently from the main clause, while the infinitival core takes it over from the main clause. In RRG, this relation, independence or succession of tense, can be represented by the layered structure of operator projections on each clause. Figure 1 presents the layered structure of the clause with operator projections (cf. Van Valin 2005: 12).

SENTENCE

(LDP) CLAUSE (RDP)

(PrCS) CORE (PoCS)

(XP) (XP) XP (XP) NUC (XP) (XP)

PRED

V

NUC ←——— Aspect

NUC ←——— Negation

NUC/CORE ←——— Directionals

CORE ←——— Event quantification

CORE ←——— Modality

CORE ←——— Negation

CLAUSE ←——— Status

CLAUSE ←——— Tense

CLAUSE ←——— Evidentials

CLAUSE ←——— Illocutionary Force

SENTENCE
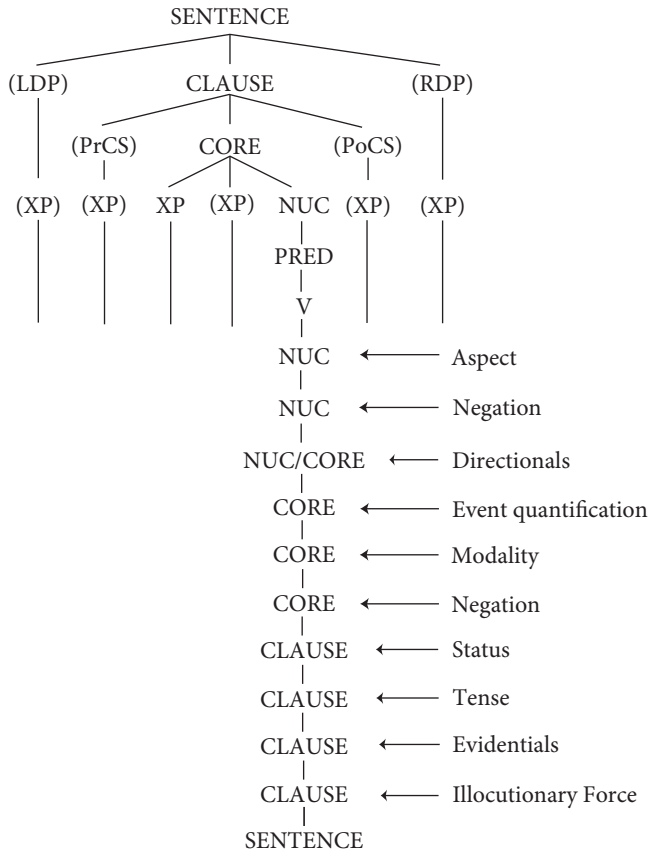
Figure 1. Layered structure of operator projections.

The maximal operator projection is restricted to negation in the core level, and it goes to illocutionary force in the clause level structure. With reference to figure 1, examples (4) and (6) have their maximal operator projection shown in (8a) and (8b) respectively.

(8) a. $\langle_{IF}\langle$**believe'**(je,$\langle_{NEG}\langle$[**understand'** (je, ce que tu veux dire)]$\rangle\rangle\rangle\rangle\rangle$
  b. $\langle_{IF}\langle$**believe'**(je,$\langle_{TNS}\langle$[**understand'** (je, ce que tu veux dire)]$\rangle\rangle\rangle\rangle\rangle$

In the LS shown in (8a), the infinitival core has the negation operator as its maximal projection, and takes over the tense and other operators belonging to the clause level from outside of the infinitival core. The subordinate clause of the LS in (8b) has the tense operator independently. In the case of clause subordination, more external operators such as evidential and illocutionary force are projected from outside of the subordinate clause. Here, illocutionary force (IF) typifies these external operators.

    With the specifications of operator projections, the LS (8a) predicts sentences that may comprise modality or negation as shown in (9a)–(9c). And as is predicted, these sentences are perfectly grammatical.

(9) a. Je crois pouvoir résoudre cette problème.
         I think can.INF resolve.INF this problem
         'I think that I can resolve this problem.'

     b. Je crois devoir attirer votre attention sur cette problème
         I think must.INF attract.INF your attention on this problem
         'I think that I must attract your attention on this problem.'

     c. Je crois ne pas l'avoir convaincu.
         I think NEG NEG 3SG.ACC-AUX.PFT.INF convince.PP
         'I think that I didn't convinced him.'

The instantiations of modality in (9a) and (9b) accord with the prediction based on the LS in (8a); example (9a) includes a root modality *pouvoir* (can) which denotes the subject's ability, and similarly sentence (9b) comprises another root modality *devoir* (must) which exhibits the subject's obligation. When the negation operator is instantiated, the resulting sentence will comprise a negation marker as in (9c). Thus, the LS in (8a) has negation as its maximal operator, so that the infinitival core can instantiate the lower operators inside the core negation in the resulting syntactic structures.

    Appropriate infinitival cores like (9a)–(9c) have their corresponding clausal subordinates as in examples (10a)–(10c) because, as the LS in (8b) implies, the clausal subordinate may have all the operators included in the infinitival core.

(10) a. Je crois que je peux résoudre cette problème.
          I think CLM I can.IND resolve.INF this problem

      b. Je crois que je dois attirer votre attention sur cette
          I think CLM I must.IND attract.INF your attention on this
          problème.
          problem

      c. Je crois que je ne l'ai pas convaincu.
          I think CLM I NEG 3SG.ACC-AUX.PFT.PST.INF NEG convince.PP

Thus, the BELIEVE class is considered to have two types of specification of operators according to the syntactic structure to be projected. (11a) is applied to the infinitival core coordination, and (11b) to the clausal subordination.

(11) a. $\langle_{IF}\langle\textbf{BELIEVE}'\,(x, \langle_{NEG}\langle[LS]\rangle\rangle)\rangle\rangle$
      b. $\langle_{IF}\langle\textbf{BELIEVE}'\,(x, \langle_{TNS}\langle[LS]\rangle\rangle)\rangle\rangle$

In the next section, the linking operation from these LSs to their corresponding syntactic structures will be discussed.

2.1.3   *Linking from LS to syntax*

After the elaboration of the LSs, much of the discussion in this section will be focused on the linking operation from semantics to syntax. It is necessary to elucidate the function of the operators that dissociate syntactically the infinitival core coordination that has no clause linkage marker from the clausal subordination that involves a clause linkage marker.

Taking the sentences in (4) and (6) for example, their LSs can be presented with some specifications of operators as in (12a) and (12b) respectively.

(12) a. $\langle_{IF} DEC \langle_{TNS} PRES \langle$**believe′** (je,$\langle_{NEG} \langle$[**understand′** (je, ce que tu veux dire)]$\rangle\rangle\rangle\rangle\rangle$

  b. $\langle_{IF} DEC \langle_{TNS} PRES \langle$**believe′** (je,$\langle_{TNS} PRES \langle$[**understand′** (je, ce que tu veux dire)]$\rangle\rangle\rangle\rangle\rangle$

In the infinitival core coordination represented in (12a), the maximal operator projection of the infinitival core is limited to the negation operator (affirmative in this case), and the illocutionary force operator and the tense operator (specified for declaration and present respectively) range over the whole sentence. The linking operation from LS to syntax is illustrated in figure 2.
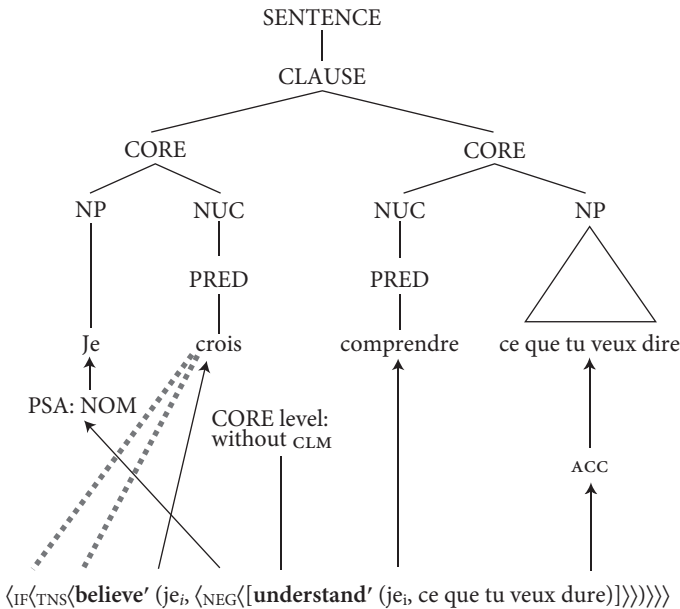
Figure 2. Linking of core coordination.

Firstly, the necessity of the clause linkage marker is determined; when the maximal operator is restricted to the core level in the complement LS of *croire*, it is not necessary to instantiate the overt clause linkage marker. Consequently, the predicate in the complement LS *comprendre* is inflected in the infinitive without any reflection of operators. PSA in CORE 2, shared with PSA in CORE 1 and co-indexed with it, is linked to no syntactic element. It should be noted that in the nexus relation of coordination, at least one argument must be shared and PSA is shared between two cores in this case. In this construction, the information structure is that of predicate focus (Lambrecht 1994, 2000); that is to say, the predicate and its argument LS "*comprendre ce que tu veux dire*" are all in the focus domain.[2]

Different steps are needed for the clausal subordination. In (12b), the maximal operator projection reaches up to the tense operator in the subordinate clause. Here, an overt clause linkage marker is instantiated as in Figure 3.
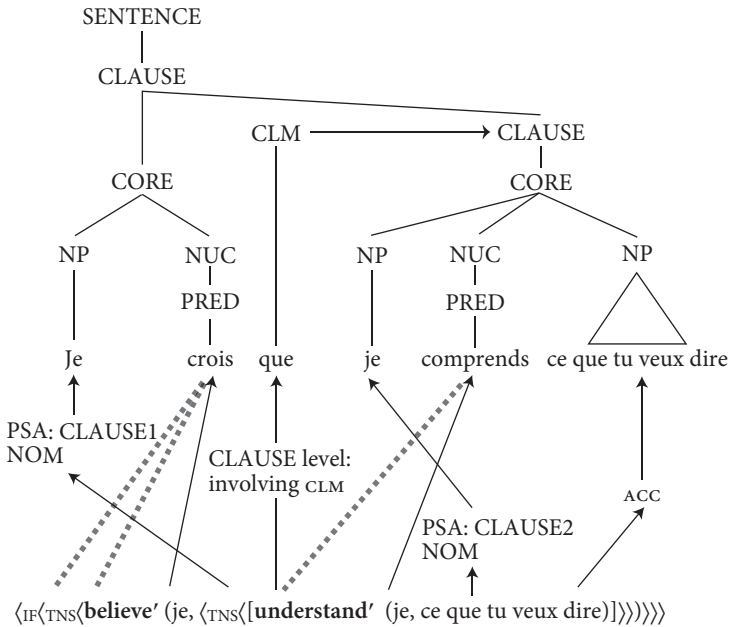
Figure 3. Linking of indicative clause.

The point is again the level of the maximal operator projection in the complement LS of *croire*. Since the complement LS has its clause level operator, an overt clause linkage marker *que* is required. The PSA in CLAUSE 2 is not controlled by the PSA in CLAUSE 1

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2. See note 7, sections 2.3.1 and 2.3.2.

and it is neither a syntactic pivot nor a pragmatic pivot. Following that, the PSA in CLAUSE 2 is instantiated as nominative and the verb in the subordinate clause inflects for the person and a suitable tense. In this case, because of the markedness of this syntactic structure with two identical PSAs, the focus domain is restricted to an argument: a narrow focus on the PSA of CLAUSE 2. The relation between the markedness of the syntactic structure and information structure will be discussed in section 2.3.1.

A crucial point is that the clause linkage marker *que* is instantiated by the clause level operator. This enables the correct projection of different syntactic structures from their logical structures. Although the lexical meaning of *croire* is common to both of two complementation patterns, the maximal operator projection determines the syntactic structure to be adopted.

2.2   Difference of mood

This section is devoted to the discussion of how to represent the difference of mood between the indicative and the subjunctive at the same level of clausal subordination. As was mentioned earlier, explanations in terms of the nexus relation or the juncture level are not sufficient for the modal opposition at the same syntactic level. For this problem, the specification of another operator is efficient to reflect the correct verb forms.

2.2.1   *LS of WANT class*

In a similar fashion to the BELIEVE class, the verbs of the WANT class appear in both the infinitival core coordination and the clausal subordination cases. The most important difference between the WANT class and the BELIEVE class is that the former requires the subjunctive mood in the clausal subordinate.

(13) a. Je veux qu'il   réussisse   au concours   d'entrée.
         I   want CLM-he succeed.SUB at examination of-entrance
         'I want that he would succeed in the entrance exam.'

     b. Elle souhaite que son mari   se   guérisse.
         she wish   CLM her husband REFL cure.SUB
         'She wishes that her husband be better.'

In example (13a), the verb of the subordinate clause *réussir* (succeed) takes the form of the subjunctive, and *guérir* (cure) in (13b) is also inflected in the subjunctive. Although the exact meaning of the subjunctive mood is a controversial topic (cf. Damourette & Pichon 1911–1936; Imbs 1953; Bybee 1985; Bybee et al. 1994, etc.), the irrealis meaning seems to be pertinent for this class of verbs in the light of non-realization of the event expressed in the subordinate clause. In other words, it is possible to specify the status operator of the WANT class as irrealis in advance. In this context, the LS of the WANT class can be given schematically as in the following formula (14).

(14)   **WANT′** (x, ⟨*IRR*[LS]⟩)

Taking the sentence in (13a) for instance, the complete description of the LS can be developed from (14) by specification of operator projections.

(15) $\langle_{\text{IF}} \langle_{\text{TNS}\,i} \langle$**want**$'$ (je, $\langle_{\text{TNS}\,i} \langle_{\text{STA}}$ *IRR* $\langle$ [BECOME **succeeded**$'$ (il, concours d'entrée)] $\rangle\rangle\rangle\rangle\rangle\rangle\rangle$

The LS in (15) defines that the maximal operator projection is limited to tense in the subordinate clause and that the status operator is specified as irrealis. More precisely, the subordinate clause can have its own tense operator, which is nevertheless always co-indexed with the main clause tense.

A series of examples confirms that the main clause tense has influence on the tense in the subordinate clause.

(16)   a.   Je veux   qu'il   vienne   à l'heure.
              I   want.PRES CLM-he come.SUB.PRES on time
              'I want that he (should) come in time.'

         b.   *je veux   qu'il   vînt   à l'heure.
              I   want.PRES CLM-he come.SUB.IMP.PST on time

         c.   Je voulais   qu'il   vienne   à l'heure.
              I   want.PST.IMP CLM-he come.SUB.PRES on time
              'I wanted that he would come in time.'

         d.   Je voulais   qu'il   vînt   à l'heure.
              I   want.PST.IMP CLM-he come.SUB.IMP.PST on time

Example (16b) shows that the imperfect past form of the subjunctive is excluded when the main verb is in the present tense. In contrast, the present form of the subjunctive is still plausible even when the tense in the main clause is shifted to the past as in (16c). In this case, it is also possible to use the imperfect past form as shown in example (16d). Although the use of the imperfect past form is almost facultative, it can appear only in accordance with the tense of the main clause.[3] That is to say, contrary to the indicative clause that can represent its independent tense, the tense in the subjunctive clause is obligatorily dependent. These facts confirm that the subordinate clause has the tense operator co-indexed with that of the main clause, and that the status operator is specified as irrealis.

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3.   The present subjunctive (*subjonctif présent*) and the imperfect past indicative (*indicatif imparfait*) are frequently used instead of the imperfect past subjunctive (*subjonctif imparfait*). This variation of verb forms seems dependent on the regularity of the conjugation rule and on the token frequency of each verb; the verb *venir* (come) has an irregular rule but is used very frequently. As a consequence, its imperfect past subjunctive form is well conserved.

Figure 4. Linking of subjunctive clause.

2.2.2   *Linking from LS to subjunctive clause*

The important difference between the subjunctive and the indicative mood does not reside in their syntactic structures, but in the specifications of the tense and status operators inside the clausal subordinate. Figure 4 shows the linking process of the clausal subordinate with the subjunctive mood.

First, the clause level operator instantiates the overt clause linkage marker *que* in the same way as in Figure 3. Next, since the status operator is set up as irrealis in advance, the verb of the subordinate clause is conjugated in the subjunctive form. Lastly, the correct tense form is to be selected because the tense operator in the subordinate clause is co-indexed with the main clause tense.

The other points are processed in the same way as in the indicative clause; the PSA in the second clause is neither a syntactic pivot nor a pragmatic pivot, so it is realized as an independent subject. The upper operators such as evidentials and illocutionary force cover the sentence entirely from outside of the subordinate clause. The focus structure is by default predicate focus when the PSAs are not identical, and the main predicate and the subordinate clause are included in the focus domain (Lambrecht 1994, 2000).[4]

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4.   The focus structure depends on the (un)markedness of the syntactic structure. See sections 2.3.1 and 2.3.2.

In cases where two PSAs are identical, the WANT class requires infinitival core coordination by priority except for some marked cases that will be discussed in 2.3.1.

In complex sentences constructed by complement taking verbs, there exists the syntactic difference between infinitival core coordination and clausal subordination on one hand, and on the other hand the modal opposition between the indicative and the subjunctive. This syntactic difference and the opposition of mood can be integrated solely in the logical structure by specifying the operator projections.

2.3   Further elaborations

Now that the principal idea of our approach in resorting to operator constraints has been presented, some applications of this approach to related issues are proposed, in particular the relevance of the information structure to the complementation patterns and the scope of external negation pertaining to the usage of the subjunctive mood after certain types of predicates.

2.3.1   *Information structure*

It has been mentioned that with the verbs of the BELIEVE class, when the subjects are identical in two clauses, it is possible to exchange the infinitival core coordination for the clausal subordination, and vice versa. However, in the case of the WANT class, this alternation is impossible except when the subordinate clause includes the mood, passive, perfective aspect, or coordination (cf. Ruwet 1991: 13–33).

(17)   a.   Je veux partir   en vacances.
            I   want leave.INF for vacation
            'I want to leave for vacation'

       b.   *Je   veux que je parte   en vacances.
            I   want CLM I leave.SUB for vacation

(18)   a.   ? Je veux que je puisse   partir   en vacances.
            I   want CLM I can.SUB leave.INF for vacation
            'I want for me to be able to leave for vacation.' (intention)

       b.   ? Je   veux que je sois   autorisé   à   partir.
            I   want CLM I AUX.PASSIVE.SUB authorize.PP to leave.INF
            'I want for me to be permitted to leave.' (intention)

       c.   ? Je veux que je sois   parti   dans dix   minutes.
            I   want CLM I AUX.PFT.SUB leave.PP in   ten   minutes
            'I want for me to have left in ten minutes.' (intention)

       d.   Je veux que tu partes   et   que je puisse rester chez moi.
            I want CLM you leave.SUB and CLM I can.SUB remain in.my.house
            'I want for you to leave and for me to remain in the house.' (intention)

In general, the same subject cannot appear in the subordinate clause after the verb *vouloir* as shown in (17b). However, examples (18a)–(18d) show that there are particular cases where two identical subjects can appear. In these constructions, the two identical grammatical subjects can be considered to designate two separate referents (cf. Ruwet 1991).

For example, in sentence (18a), two different aspects of the same referent are highlighted: a subject of volition and another subject that may be able to leave for vacation. In the example of passive (18b), the subject of the main clause is an active entity who is willing to leave and that of the subordinate clause is a passive entity who may be permitted to leave. Example (18c) represents a transition of the state of affairs; from a state of willing to leave to another future state where the process will have been accomplished.[5] Indeed the referents denoted by the two subjects in each sentence are always identical, but it is possible to consider them as different referents due to certain syntactic and semantic structures. In other words, in order to allow two identical subjects to appear, contrast is needed to dissociate the subject of the subordinate clause from that of the main clause. This contrast is most facilitated in (18d) in which two syntactically similar clauses are coordinated and the opposition between *tu* (you) and *je* (I) is accentuated; after the overt contrast between *je* in the main clause and *tu* in the first subordinate clause, *je* in the second subordinate clause is set against *je* in the main clause.[6] Among these sentences, the sentence involving the infinitival complement (17a) is an unmarked construction for the identical subjects, and examples (18a)–(18d) are marked cases.

This constructional markedness pertains to a change of focus domain in terms of information structure (Lambrecht 1994, 2000). As has been remarked earlier, the core coordination structure is adopted by priority for the case of identical subjects. Here, the focus structure is unmarked in accordance with the unmarkedness of the syntactic structure: predicate focus structure.[7] Hence, the focus is oriented to the main predicate and the coordinated core entirely. On the other hand, in the case of clausal subordination in which two subjects are realized independently as in (18a)–(18d), in spite of the identical referent, the information structure corresponds to a marked case: narrow focus on one argument. This time, the focus domain is concentrated on the PSA in the subordinate clause. This narrow focus can be confirmed by the following examples (cf. Ruwet 1991: 24, 40).

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5. Native judgments do not agree on examples (18a)–(18c). Some speakers insist that the conditional must be used in the main clause as in example (20).

6. If the order of the two coordinated subordinate clauses is alternated, (18d) becomes unacceptable. **Je veux que je reste chez moi et que tu partes.*

7. "Sentence construction expressing a pragmatically structured proposition in which the subject is a topic (hence within the presupposition) and in which the predicate expresses new information about this topic. The focus domain is the predicate phrase" (Lambrecht 2000: 615).

(19) a.   Alors, tu   pars,   ou je pars?
            so   you leave.IND or I leave.IND
            'Well, do you leave or do I leave?'

      b.   Moi, je veux que je parte.
            me, I   want that I   leave.SUB
            'For me, I want to leave.'

(20) Je voudrais   que, moi aussi, je puisse   partir.
       I   want.COND CLM me   too   I   can.SUB leave.INF
       'For me, I want to leave.'

In example (19), the act of leaving is presupposed and the issue is centered on the decision of the agent. In this case, the subject of *partir* (leave) is in the focus domain and *je* (I) is accentuated in the response of (19b). In example (20), "*moi aussi*" (me too) is inserted in order to emphasize the independency of the subject in the subordinate clause. As these sentences show, in clausal subordination with two identical subjects, the narrow focus is oriented to the PSA of the subordinate clause; to put it another way, clausal complementation with two identical PSAs comes to be plausible if the PSA in the subordinate clause is highlighted in terms of information structure. When the subjects are evidently different as in (13a) or (13b), clausal subordination is a unique option as a syntactic structure. As a consequence, the focus structure is also in accord with the unmarked type and the predicate focus structure is to be adopted.

    In the case of the BELIEVE class also, an infinitival core (21a) is slightly preferred to clausal subordination (21b) when two subjects are identical.[8] In example (21b), the subject of the subordinate clause is certainly emphasized.

(21) a.   Je crois comprendre   ce que tu veux dire.
            I   think understand.INF it   that you want say

      b.   Je crois que je comprends   ce que tu   veux dire
            I   think CLM I   understand.IND.PRES it   that you want say
            'I think that I understand what you mean.'

These sentences are both plausible. Hence, the verbs of the BELIEVE class are not obliged to devise marked constructions where the subject of the subordinate clause would be contrasted with that of the main clause as in (18a)–(18d). Consequently, there exists a difference of degree of (un)grammaticality between the WANT class and the BELIEVE class vis-à-vis the usage of two identical subjects. However, these two classes are common in that the selection of the syntactic structure pertains to the organization of the focus structure. This relation between the syntactic structure and the

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8. This preference is based on research on the FRANTEXT (corpora available on the site of *ATILF* (*Analyse et Traitement Informatique de la Langue Française*)).

information structure can be formulated in the constructional schema of each complementation pattern.

2.3.2   *Constructional schemas*

Now, it is necessary to specify the relation among three elements: the pragmatics or focus structure, the identity of PSAs, and the syntactic structure to be projected. These elements can be specified in the constructional schemas.

The constructional schema for the infinitival core coordination is provided in Table 1.

Table 1. Constructional schema for French infinitival core coordination

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Construction: French infinitival core coordination

SYNTAX:
   Juncture: core
   Nexus: coordination
      PSA: Core 1: syntactic controller = pragmatic controller
            Core 1 + n: syntactic pivot
MORPHOLOGY:
   CLM: None
SEMANTICS:
   sharing a common primary topical participant;
   $\langle_{\text{IF}}\langle_{\text{TNS}}\langle\textbf{PRED}'\,(\text{x},\,\langle_{\text{NEG}}[\text{LS}]\rangle)\rangle\rangle\rangle$
PRAGMATICS:
   Illocutionary force: unspecified
   Focus structure: predicate focus (default)

There are specifications of the juncture type and the nexus relation, which are parameterized as core and coordination respectively. There is also a specification of the role of two PSAs; PSA in core 1 is instantiated syntactically and this functions as a syntactic and pragmatic controller, whereas PSA in core 1 + n serves as a syntactic pivot because this construction is applicable only to the case of two identical PSAs. In this construction, no clause linkage marker is needed as specified in the morphology, which is determined in turn by the maximal operator projection in the logical structure of the semantics. In the pragmatics, the predicate focus structure is adopted by default, and the main predicate and the coordinated infinitival core are included in the focus domain.

Table 2 represents the constructional schema for the clausal subordination.

There are a number of differences from the infinitival core coordination. Firstly, the two PSAs are both instantiated independently. Also, the definition of the morphology specifies the clause linkage marker as *que*, which is required by the clause level operator described in the semantics. In the description of the semantics, the status operator is to be specified as realis or irrealis according to the type of the predicate, and the tense operator must be co-indexed with the main clause tense in the case of

the WANT type. It should be noted that the focus structure has two patterns; one is an unmarked case where the two PSAs are not identical, and the other is a marked one in which they are identical.

Table 2. Constructional schema for French clausal subordination

Construction: French clausal subordination
SYNTAX:
Juncture: asymmetry between core and clause
Nexus: subordination
PSA: Core 1: default
Core 1 + n: default
MORPHOLOGY:
CLM: complementizer *que*
SEMANTICS:
$\langle_{\text{IF}}\langle_{\text{TNS}}\langle\textbf{PRED}'(\text{x}, \langle_{\text{TNS}}\langle_{\text{STA}}[\text{LS}]\rangle\rangle)\rangle\rangle\rangle$
PRAGMATICS:
Illocutionary force: unspecified
Focus structure: Predicate focus (default);
Narrow focus on PSA of Core 1 + n

When the two PSAs are not identical, the constructional schema for the clausal subordination is automatically selected. If the two PSAs are identical, one of these constructional schemas must be adopted in accordance with the pragmatics. From the perspective of semantics to syntax linking, the selection of the constructional schema is motivated and determined by the pragmatics or the focus structure to be expressed in discourse. Indeed, the WANT class and the BELIEVE class are both able to appear either in an infinitival core or in a clausal subordinate complementation. However, by the logical structure and the constructional schemas developed in this section, it is possible to predict the correct complementation pattern.

2.3.3 *Transparency of external negation*

There remains one confusing problem: in general, the verbs of the BELIEVE class require the indicative mood in the subordinate clause, but when they are negated, the subjunctive mood can also appear.

(22)   a. Je crois que c'est   souhaitable.
            I   think CLM it-be.IND.PRES preferable
            'I think that it is preferable'

      b. *Je crois que cela soit   souhaitable.
           I   think CLM it   be.SUB.PRES preferable

      c. Je ne   crois pas que c'est   souhaitable.
          I NEG think NEG CLM it-be.IND.PRES preferable
          'I don't think that it is preferable.'

    d. Je ne crois pas que cela soit   souhaitable.
       I NEG think NEG CLM it   be.SUB.PRES preferable

(22a) is an affirmative sentence with the indicative mood. As (22b) shows, if the main verb *croire* is affirmative, the subjunctive mood cannot appear in the subordinate clause. When it is negated, the verb in the subordinate clause can be conjugated not only in the indicative (22c), but also in the subjunctive (22d). Evidently, it is the negation of *croire* that has influence on the status of the subordinate clause and triggers the usage of the subjunctive mood.[9]
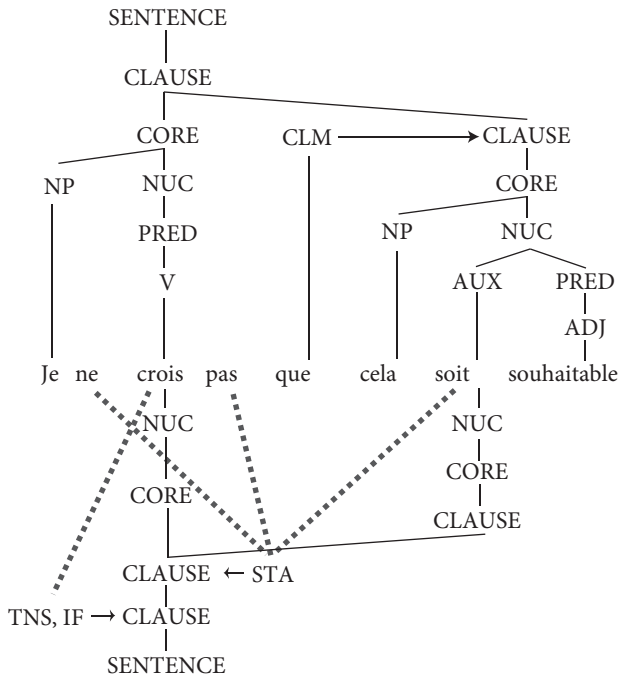
Figure 5. Projection of external negation.

In the complementation hierarchy or binding hierarchy (cf. Givón 1980; Noonan 1985; Lehmann 1988), the verbs of the BELIEVE class are categorized in the class of propositional attitude in which discourse dependency is assertive, epistemic dependency is realis, and time reference dependency is independent. In general, such predicates require the indicative mood in their subordinate clauses.

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9. Interrogatives and conditionals are also elements that trigger the use of the subjunctive. This suggests that the illocutionary force and the evidential operators are also candidates that affect the status operator in the subordinate clause.

However, the class of propositional attitude seems to be sensitive to polarity changes as in example (22); if these predicates are negated in the main clause, the epistemic dependency of the subordinate event may become irrealis. These dependency parameters are not always fixed, and the class of propositional attitude is transparent to negation. That is to say, negation in the main clause may range over the subordinate clause. When the subordinate clause is in the scope of the main clause negation, the status operator of the subordinate clause comes to be specified as irrealis.

This phenomenon is illustrated in Figure 5. The status operator, which instantiates the negation marker and functions as external negation in the main clause, has influence on the status of the subordinate clause at the same time.

Certain types of predicates are sensitive to epistemic dependency and the external negation in the main clause directly affects the status operator of the subordinate clause. However, this variation of mood is essentially optional and dependent on the speaker's cognition or intention vis-à-vis the status of the subordinate event, because examples (22c) and (22d) are both grammatical.

2.3.4   *Propositions for other complement taking predicates*

The approach proposed in this paper is to treat different syntactic structures and various verb forms in a unifying way by specifying the operator projections in the logical structure. This section shows applications of our approach to other complement taking predicates such as utterance (*dire* (say)), commentative (*regretter* (regret)), knowledge (*se souvenir* (remember)), and fearing (*craindre* (fear)). Since these predicates in fact appear in syntactic structures similar to the WANT type and the BELIEVE type, their LS can be defined in the same way.

(23) a. Il a   dit   qu'il   avait   oublié   ses   devoirs.
         he AUX.PFT.PST say.PP CLM-he AUX.PLUP forget.PP his   homework
         'He said that he had left his homework.'

   b. $\langle_{IF} \langle \mathbf{say'} (x, \langle_{TNS} \langle [LS] \rangle \rangle) \rangle \rangle$

(24) a. Je regrette d'être   venu   avec lui.
         I regret   of-AUX.PFT come.PP with him
         'I regret having come with him.'

   b. Je regrette qu'il   soit   venu   avec nous.
         I regret   CLM-he AUX.PFT.sub come.PP with us
         'I regret that he has come with us.'

   c. $\langle_{IF} \langle \mathbf{regret'} (x, \langle_{NEG} \langle [LS] \rangle \rangle) \rangle \rangle$

   d. $\langle_{IF} \langle \mathbf{regret'} (x, \langle_{TNS} \langle_{STA} IRR \langle [LS] \rangle \rangle \rangle) \rangle \rangle$

(25) a. Je me   souviens   que cela a   été   discuté.
         I REFL remember CLM it   AUX.PFT.IND AUX.PASSIVE discuss.PP
         'I remember that it has been discussed.'

b.   Je   ne   me   souviens   pas   que   cela   ait   été
     I   NEG   REFL   remember   NEG   CLM   it   AUX.PFT.SUB   AUX.PASSIVE

discuté.
discuss.PP
'I don't remember that it has been discussed'

c. $\langle_{IF} \langle \textbf{remember}' (x, \langle_{TNS} \langle_{STA} (IRR) \langle[LS]\rangle\rangle\rangle)\rangle\rangle$

(26)   a.   Il   craint   de   le   dire   à   sa   mère.
          he   fear   of   it.ACC   say   to   his   mother
          'He is afraid of saying it to his mother'

b.   Il   craint   que   je   ne   le   dise   à   sa   mère.
     he   fear   CLM   I   NEG.EXPLETIVE   it.ACC   say.SUB   to   his   mother
     'He is afraid that I would say it to his mother'

c. $\langle_{IF} \langle \textbf{fear}' (x, \langle_{NEG} \langle[LS]\rangle\rangle)\rangle\rangle$

d. $\langle_{IF} \langle \textbf{fear}' (x, \langle_{TNS} \langle_{STA} IRR \langle[LS]\rangle\rangle\rangle)\rangle\rangle$

Verbs of utterance such as *dire* (say) in (23a) appear with the clausal subordinate with the indicative mood, and their LS can be specified as in (23b). The complement LS is covered by the tense operator in the same way as the BELIEVE class. Next, the class of commentative predicates can be followed either by the infinitival core or by the clausal subjunctive complement as shown in (24a) and (24b), respectively. It is possible to apply the LSs of the WANT class in order to obtain (24c) and (24d) respectively. The LS in (25c) can project both (25a) and (25b); similar to the BELIEVE class, verbs related to the acquisition or loss of knowledge can introduce the subjunctive mood in the subordinate clause when they are negated. Finally, sentences (26a) and (26b) have the same logical structure as the WANT class. Since the verb *craindre* (fear, be afraid) expresses a volition that is oriented to non-actualization of the subordinate event, the status operator can be set to irrealis.

These examples show that suitable syntactic structures and appropriate verb forms are predictable by the specification of the operators in the logical structure of each class.

3.   Concluding remarks

Complementation patterns are determined not only by lexical semantics, but also by operators and pragmatic factors. Our proposal is to prescribe the operator projections in the logical structure of each class of verbs and to develop the constructional schemas for the complementation patterns. As a generalization of the analyses presented in this paper, the following LSs can be provided for the BELIEVE class and the WANT class.

(27)   a. $\langle_{\text{IF}} \langle_{\text{TNS}} \langle \textbf{BELIEVE}' \, (\text{x}, \langle_{\text{NEG}} \langle [\text{LS}] \rangle \rangle \rangle \rangle \rangle$

   b. $\langle_{\text{IF}} \langle_{\text{TNS}} \langle \textbf{BELIEVE}' \, (\text{x}, \langle_{\text{TNS}} \langle [\text{LS}] \rangle \rangle \rangle \rangle \rangle$

   c. $\langle_{\text{IF}} \langle_{\text{TNS}} \langle \textbf{WANT}' \, (\text{x}, \langle_{\text{NEG}} \langle [\text{LS}] \rangle \rangle \rangle \rangle$

   d. $\langle_{\text{IF}} \langle_{\text{TNS}i} \langle \textbf{WANT}' \, (\text{x}, \langle_{\text{TNS}i} \langle_{\text{STA}} IRR \langle [\text{LS}] \rangle \rangle \rangle \rangle \rangle$

Potentially, these classes of verbs have two complementation patterns according to the identity of the PSAs and the focus structure to be adopted in discourse. The LSs in (27a) and (27c) are linked to the infinitival core coordination and they are excluded in the case of two different PSAs. Contrary to that, the LSs in (27b) and (27d) construct the subordinate clause and different PSAs are required by default.

Relevant information necessary to describe the operator constraints is considered to be language specific, so that the descriptions of logical structures or constructional schemas developed in this paper might not be applicable directly to other languages. However, the idea of approaching the complementation patterns by specification of the operators will be favorable for analyses of other languages.

Abbreviations

ACC	accusative	PFT	perfective
AUX	auxiliary	PLUP	pluperfect
CLM	clause linkage marker	PP	past participle
COND	conditional	PRES	present
IMP	imperfective	PST	past
IND	indicative	REFL	reflexive
INF	infinitive	SG	singular
NEG	negation	SUB	subjunctive

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Complementizer-gap phenomena

Syntactic or pragmatic constraints?

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Since Perlmutter (1971) the complementizer-gap effect has received much attention in linguistic research. This article investigates the solution presented in Van Valin (2005) which states that the phenomenon should be explained in pragmatic rather than syntactic terms. Using data from Swedish and several other languages I will argue that such a solution is unlikely to be correct, and that the English and Swedish facts are better explained by referring to available syntactic constructions. My conclusion is that in a cross-linguistic perspective restrictions on subject extraction must be regarded as a very heterogeneous phenomenon, and in order to explain the empirical data I will suggest a number of competing motivations related to the Accessibility Hierarchy, argument linking and syntactic templates.

1. Introduction

The complementizer-gap effect, also known as the comp-trace or *that*-trace effect, may be illustrated with the following Swedish examples, where the English translations show that the effect in these two languages is similar:

(1) *Jag tror (att) John vann US Open.*
I think (that) John won US Open
'I think (that) John won the US Open.'

(2) *Vad tror du (att) John vann?*
what think you (that) John won
'What do you think (that) John won?'

(3) *Hur tror du (att) John vann US Open?*
how think you (that) John won US Open
'How do you think (that) John won the US Open?'

(4) *Vem tror du (*att) vann US Open?*
who think you (that) won US Open
'Who do you think (*that) won the US Open?'

That is, while the complementizers *that* and *att* are optional in English and Swedish object and adjunct extractions, they are obligatorily deleted in subject extractions. In the light of the Accessibility Hierarchy (Keenan & Comrie 1977), which states that in a cross-linguistic perspective the subject is generally the easiest function to relativize on, the fact that subject extraction is more restricted than any other function in English and Swedish is quite surprising. The complementizer-gap effect has been dealt with in many theoretical frameworks and countless solutions have been proposed over the years. Most such explanations have been developed within some type of generative framework, and the aim has usually been to define a limited number of syntactic constraints which could explain restrictions on Discontinuous Dependencies or extraction in general.[1] Solutions of this type can be found in Bresnan (1977); Chomsky & Lasnik (1977); Pesetsky (1982); Grimshaw (1997); Rizzi (2000), etc. Other linguists have proposed syntactic explanations which are quite different from the solutions proposed by the above mentioned authors – such proposals can be found, for example, within the framework of Head-Driven Phrase Structure Grammar (Pollard & Sag 1994; Bouma et al. 2001). Yet another type of syntactic explanation can be found in Hawkins (2004), who provides a solution connected to efficiency of syntactic processing.

In recent years, explanations have been offered from a very different perspective. The claim of this other approach is that restrictions on extraction cannot be explained in syntactic terms, but instead such restrictions are related to whether a certain position is a *potential focus position* or not (Van Valin & LaPolla 1997; Van Valin 2005). This type of solution, introduced within the framework of Role and Reference Grammar, has recently been adopted in Construction Grammar as well (Goldberg 2006). Even though Van Valin acknowledges that "restrictions on WH-question formation and related constructions are the result primarily of complex interaction of syntactic structure and focus structure" (2005: 292), he maintains the view that complementizer-gap effects in English can be explained mainly in terms of focus structure, more specifically by claiming that in English the subject position following a complementizer is the most marked focus position.

However, although I agree with the basic ideas of Van Valin's approach, I will argue that it seems very unlikely that complementizer-gap effects of the type found in for example English and Swedish can be accounted for by referring to potential focus domains. Thus, in response to the explanation presented in Van Valin (2005), I will

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1. *Discontinuous Dependencies* is the term used e.g., in Culicover & Jackendoff (2005) in order to describe various types of *wh*-questions, relativizations and topicalizations, where a certain element occurs in a non-canonical position, in transformational theories usually described as "movement". I will use the term *extraction* for constructions where a certain element is separated from its own clause by intervening material.

argue for an essentially syntactic solution, but one that very much differs from solutions presented in traditional generative models.[2]

2. The explanation of RRG

Several linguists have argued that so-called island effects can be explained in terms of pragmatic restrictions, among them Van Valin (2005) and Goldberg (2006). The basic idea is that only elements which appear in the *potential focus domain* of the sentence can be extracted. One argument for such an approach is based on the typological distribution of island effects. Van Valin & LaPolla (1997: 616ff) show that such effects occur not only in languages with *wh*-fronting such as English, but also in languages such as Lakhota where the *wh*-element remains in its canonical position (so-called *wh*-in situ). This is a very important observation, and it provides a strong argument against a single movement-based explanation for island effects.

I believe that many island constraints can be explained by the sort of restrictions described in e.g., Van Valin (2005), but crucially I do not believe that this type of solution can explain complementizer-gap effects. Van Valin (2005: 278) makes the following claim regarding the role of potential focus domains in *wh*-initial languages such as English:

> In languages of this type, the position of the WH-word in the question is not relevant to explaining the subjacency effects, because in all questions of this kind the WH-word occurs in the precore slot, regardless of the grammaticality of the question. Rather, what is relevant is whether the potential focus domain extends into the clause in which the question word functions semantically.

I believe that this statement is quite a reasonable one, since it assures that the extracted element represents what the sentence is about (the so-called "aboutness-constraint", cf. Van Valin 2005: 285). However, in my opinion Van Valin's following claim regarding the effects of *narrow focus* is much more dubious (2005: 291):

> A WH-word is narrow focus, and in a language in which WH-words occur *in situ*, the position in the clause where the WH-word occurs must be a possible position for narrow focus. In a language like English in which the WH-word occurs in the precore slot, the corresponding requirement is that the position the WH-word is interpreted as filling in the clause must be a possible position for narrow focus.

This constraint states that the extraction site must be a potential position for *narrow focus* (i.e., a focus-domain extending over just a single constituent). *Unmarked* narrow focus in SVO languages is usually the postverbal position while in SOV languages

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it is usually the preverbal position. Van Valin argues that the crucial property of the complementizer *that* in English is that it "blocks marked narrow focus on the preverbal privileged syntactic argument position …" (2005: 292). However, in my opinion the test Van Valin uses to distinguish this position from narrow focus positions is not particularly convincing (2005: 291):

(5)   *Scully said Mulder talked to the detective. – No, Skinner.*

(6)   *Scully said that Mulder talked to the detective. – No, Skinner.*

The claim is that in (5), *Skinner* could "replace" any of the three NP arguments, while in (6) the reading where *Skinner* replaces *Mulder* is ruled out. In Van Valin's opinion this indicates that the embedded subject following a complementizer is not a narrow focus position. I would argue that at least in Swedish, there is no distinction whatsoever between the interpretations of the replies in structures similar to (5) and (6). In the light of the fact that the complementizer-gap effect is very strong in Swedish, it seems that the absence of such as distinction makes the RRG solution somewhat questionable. That is, it may well be that the interpretation of the replies in (5) and (6) are guided by issues concerning topic and focus status, but there is little that indicates that this status is affected by the occurrence or non-occurrence of a complementizer. Since one of the most crucial issues related to the complementizer-gap effect concerns precisely this difference, the RRG solution does not seem to account for the facts.

Another indication of the fact that complementizer deletion is not connected to embedded subject focusing is provided by the following Google-test, where structures containing embedded subject pronouns and embedded subject proper nouns are compared:

Table 1. Topic and focus in the embedded subject position

	han ("he")	hon ("she")	Total	%		
Jag tror Ø PRON	118000	62300	180300	49.5		
Jag tror att PRON	126000	57600	183600	50.5		
	Johan	**Peter**	**Anna**	**Maria**	**Total**	**%**
Jag tror Ø NOUN	888	630	457	227	2202	14.0
Jag tror att NOUN	3770	4610	4060	1070	13510	86.0

Considering the typically anaphoric nature of pronominal elements, it seems likely that, statistically, a larger percentage of the pronouns are topical in comparison with the proper nouns. The data in Table 1, on the other hand, indicate that complementizer deletion is much less frequent when the embedded subject is a proper noun, i.e., the exact opposite from what we would expect if such deletion leads to the possibility of embedded subject focusing.

It is also well known that in comparison with English, Swedish is more liberal in terms of extraction possibilities (see e.g., Andersson 1982; Engdahl 1982, 1985, 1997).

Consider for example the following perfectly natural extraction from an embedded NP in Swedish (Andersson 1982: 41):

(7) *Den här   tavlan   känner   jag killen   som   har   målat.*
      this here picture know   I   the guy   that has   painted
      '(??) This picture I know the guy that has painted.'

Surprisingly, however, acceptability tests show that Swedish is in fact even less accepting than English as regards complementizer-gap structures (cf. Löwenadler 2007). Note also that whereas the grammaticality of extractions such as (7) above is very much determined by semantic and contextual factors (cf. Allwood 1982; Engdahl 1997), this does not seem to be the case at all in complementizer-gap structures. These facts provide further evidence that the complementizer-gap restriction has a different origin than restrictions concerning extraction from complex NPs, adjuncts, etc.

There are also certain theoretical problems with the RRG explanation. As the effect of narrow focus is formulated, the solution implicitly makes reference to some sort of abstract syntactic structure, since the requirement is that the *position the WH-word is interpreted as filling* in the clause must be a possible position for narrow focus. But of course RRG does not acknowledge any abstract syntactic structures, rather the only abstract structure is the logical structure of the subcategorizing verb. However, this logical structure clearly does not determine whether or not an argument directly follows a complementizer, and therefore a solution along these lines is theoretically problematic as well.[3]

In summary, I believe that examples such as those above make the focus-based explanation for complementizer-gap effects essentially circular, since the main piece of evidence for the position after a complementizer not being a focus position seems to be the complementizer-gap phenomenon itself.

3. Cross-linguistic overview

The basic facts are that in embedded subject *wh*-questions, in English as well as in Swedish, complementizers such as *that* and *att* are banned, whereas in for example embedded object *wh*-questions, complementizers are optional. Note, however, that while a similar restriction appears in topicalizations and relativizations from *that*-clauses,

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3. Robert Van Valin (personal communication) suggests that the constraint could be formulated in terms of a clash between the activation status of the element in question, which is represented in Logical Structure, and the focus structure of the sentence into which it is being linked. His point is that although the presence or absence of a complementizer is not a property of Logical Structure, it constrains the possible focus structure of the sentence. However, if this is so, it is not clear to me *why* a complementizer constrains the focus structure of a construction with a fronted *wh*-element, other than as a pure stipulation.

the effect is slightly different in subject extraction from embedded interrogative and *wh*-filler clauses. Thus, consider the following Swedish sentences:

(8)   *Samma stad undrade   alla   om Putin skulle besöka.*
      same   city wondered everyone if Putin would visit
      'The same city everyone wondered whether Putin would visit.'

(9)   *Den turneringen begriper   jag inte hur han kunde vinna.*
      that tournament understand I   not how he   could win
      'That tournament I don't understand how he could win.'

(10) *Till Thomas vet   jag inte vad vi ska   köpa.*
      to   Thomas know I   not what we should buy
      'For Thomas I don't know what we should buy.'

(11) **Den killen undrade   alla   om skulle besöka Berlin.*
      that guy   wondered everyone if would visit   Berlin
      'That guy everyone wondered whether (he) would visit Berlin.'

(12) **Den jackan begriper   jag inte varför är så populär.*
      that jacket understand I   not why is so popular
      'That jacket I don't understand why (it) is so popular.'

(13) **Peter vet   jag inte vad   ska   köpa till Thomas.*
      Peter   know I   not what should buy   to Thomas
      'Peter I don't know what (he) will buy for Thomas.'

Thus, whereas object and indirect object extraction from embedded interrogative and *wh*-filler clauses, as in (8–10), are perfectly grammatical in Swedish, the subject extractions in (11–13) are completely ungrammatical and cannot be saved by complementizer deletion. On the other hand, if a resumptive pronoun is inserted in the embedded subject position in such structures, as exemplified in the English translations, the resulting sentences are again fully grammatical in Swedish. Within the generative tradition it has often been argued that the phenomenon can be connected to a "pro-drop parameter", which means that it is dependent on whether a language has a general subject requirement or not (subject versus null subject languages in the discussion below). Haiman (1990: 89–90), on the other hand, argues that the connection between obligatory subjects and the complementizer-gap phenomenon is unacceptable for two main reasons:

a.   There are languages such as Hungarian and Serbian which allow null subjects but still do not freely allow subject extraction.
b.   It leaves unexplained the grammaticality of subject extraction without a complementizer.

Similarly, Croft (2003: 80–84), states that the counterexamples found in the literature to the predictions of the pro-drop parameter show that there is no evident connection between obligatory subjects and complementizer-gap effects.

In a cross-linguistic perspective the occurrence of extraction seems to be reasonably widespread, although many languages do not employ this grammatical alternative at all; examples of the latter type are West Greenlandic (Fortescue 1984); Evenki (Nedjalkov 1997); Abkhaz (Hewitt 1979); Marathi (Pandharipande 1997) and Malayalam (Asher & Kumari 1997). A practical problem is that due to the pragmatic markedness of these constructions, acceptability tests often give varied and unclear results. For example, in Slavic languages such as Serbian and Russian it has proved difficult to determine whether extraction structures are ungrammatical or just pragmatically unusual. Addressing these facts, Comrie (1997: 180) makes the following point:

> [I]n most Slavic languages, it is hard to get reliable grammaticality judgments for the range of data that would be needed to establish constraints on extraction with the same degree of reliability as can be done for English. But the real problems to bear in mind are, first, that the difficulty in getting judgments is at least partly due to the existence of preferred alternative constructions and, second, that questionable extractions are not necessarily ruled outright ungrammatical, but rather assigned a particular stylistic, namely a low stylistic evaluation.

Accepting these problems, a short list of some languages which *do* allow extraction in at least some contexts, and where relatively clear information can be obtained regarding these issues, would look as follows:

No restrictions specifically for subjects
Spanish, Italian, Portuguese, Icelandic, Norwegian, Danish, Basque, Bani-Hassan Arabic, Maori, Hausa, Ndyuka, Slave, Maltese.

Certain restrictions specifically for subjects
English, Swedish, French, Polish, Serbian, Hungarian, Levantine Arabic, Quechua, Koromfe, Koyra Chiini.

First of all, the much discussed facts of the Germanic and Romance languages indicate that a connection between obligatory subjects and complementizer-gap effects should not be immediately ruled out. Thus, while there are subject languages such as English, Swedish, French and dialects of Dutch which show restrictions on subject extraction (see e.g., Pesetsky 1982 and Maling & Zaenen 1978), there are null subject languages such as Spanish, Italian and Portuguese where no such effects occur (Perlmutter 1971; Pesetsky 1982 and Zubizarreta 1982), as the following examples from Portuguese show (Zubizarreta 1982: 82–93):

(14) *(Ele) acredita que (ele) tenha lido esse livro.*
      (he) says   that (he) has   read that book
      'He says that he has read the book.'

(15) *Que rapazes acreditas que tenham gasto esse dinheiro?*
      which children believe.2SG that have   spent that money
      'Which children do you think spent that money?'

(16)   *Quem é que Pedro não sabia onde   trabalha?*
       who   is that Peter not know where works
       'Who is it that Pedro doesn't know where he works?'

In (14), the subject pronouns are optional in both the matrix clause and in the embedded clause, and the subject extractions (15) and (16) are perfectly grammatical despite the fact that a complementizer and a *wh*-filler are present. Furthermore, diachronic studies of English (Bergh & Seppänen 1994; Seppänen & Bergh 1996) and Swedish (Platzack 1985, 1987) show that at a time when these languages allowed null subjects, subject extraction was unrestricted as well, as in the following examples from early Swedish (Platzack 1985: 401 & 1987: 397):

(17)   *Oc rängde ower iordina fyretighi dagha oc fyretighi nätter.*
       and rained over the earth forty   days and forty   nights
       'And it rained over the earth for forty days and forty nights.'

(18)   *Och thenne Elden mena en part att   förorsakas af …*
       and this   fire   believe some   that is.caused by
       'And this fire, some believe is caused by …'

Thus, in (17) no expletive pronoun is used as subject of the verb *rängde*, and in (18) we have a typical complementizer-gap structure. On the other hand, it is clear that there are languages which do not fully conform to this pattern, such as certain dialects of Norwegian and Danish which allow complementizer-gap structures but not null subjects in general (see e.g., Engdahl 1985). I will return to these exceptions below, but perhaps an even more crucial test for the hypothesis concerns whether there are null subject languages which also show restrictions on subject extraction, a question to which I will immediately turn.

4.   Subject extraction in null subject languages

In a cross-linguistic perspective most languages allow null subjects (Dryer 2005), and among those languages the ones that allow extraction often show no particular restrictions on subject extraction. Thus, to name a few, subject extraction is allowed and no more restricted than e.g., object extraction in null subject languages such as Maori (Bauer 1993); Hausa (Newman 2000); Slave (Rice 1989); Maltese (Borg & Azzopardi-Alexander 1997) and Basque (Saltarelli 1988). However, there are also a number of languages that will be described in the following section which show such restrictions.

    In null subject languages restrictions on subject extraction obviously cannot be explained as a consequence of a general subject requirement. Thus, in order to claim that restrictions on subject extraction in subject languages are connected to the subject requirement, some other explanation or explanations must be found for null subject languages. As the basis for the discussion I will use facts from Serbian (Tijana Stajic,

p.c.), as well as from the Non-Indo-European languages Hungarian (Kenesei et al. 1998) and Quechua (Cole 1982). In these languages object extractions are perfectly grammatical with the gap strategy, but in the case of subject extractions each of the languages instead uses an alternative strategy or "escape hatch". A few such alternative strategies, or situations where subject extraction is often possible, are the following:

a.   the whole embedded clause is fronted
b.   the extracted subject has a non-standard subject case or shifts to a different case
c.   the matrix subject and the extracted subject have distinct person/gender

Consider the following examples:

Imbabura Quechua (Cole 1982: 20):

(19) *Pi-taj   ya-ngui   wagra-ta randi-shka-ta?
       who-INTERROG   think-2   cow-ACC   bought-NOMZR-ACC
       'Who do you think bought a cow?'

(20)   Pi   wagra-ta randi-shka-ta-taj   ya-ngui?
       who cow-ACC   buy-NOMZR-ACC-INTERROG   think-2
       'Who do you think bought a cow?'

Hungarian (Kenesei et al. 1998: 7):

(21) *Péter ki   akar,   hogy elsőnek érjen   ide?
       Peter who.NOM   want.3SG that first   reach.SBJ.3SG here
       'Who does Peter wish would arrive here first?'

(22)   Péter kit   akar,   hogy elsőnek érjen   ide?
       Peter who.ACC   want.3SG that first   reach.SBJ.3SG here
       'Who does Peter wish would arrive here first?'

Serbian (Tijana Stajic, p.c.):

(23) *Ko je   Bogdan rekao   da   je   pojeo   kolac?
       who AUX.3   Bogdan say.PST   that AUX.3   eat.PST   the cake
       'Who did Bogdan say ate the cake?'

(24)   Ko   si   rekao   da   je   pojeo   kolac?
       who AUX.2   say.PST   that AUX.3   eat.PST   the cake
       'Who did you say ate the cake?'

In Imbabura Quechua, subject extractions are ungrammatical, as in (19), and the only way to question an embedded subject is to prepose the whole embedded clause (20).[4] In Hungarian, subject extractions are ungrammatical unless the extracted subject

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4.   In Quechua, questioning embedded functions other than subjects have the form of either clause fronting or fronting of the *wh*-element alone (Cole 1982). Since the *wh*-element is separated from its clause only in the latter case, the former (which is used in subject questioning) does not represent extraction at all, but rather *wh*-in situ.

shifts to accusative case, as in (22). Importantly, complementizer deletion or insertion of resumptive pronouns do not help at all (in Imbabura Quechua there is no complementizer other than the nominalizing suffix, but subject extractions are still ungrammatical). As I will argue below, the nature of the escape hatches in these languages suggests that the problem is somewhat different from what is the case in languages such as English and Swedish. In particular, the difference in grammaticality between the Serbian examples (23) and (24) indicates that the problem might concern problems of argument linking between the embedded verb and a certain NP in the upper clause (the facts seem to be exactly parallel for many speakers of Polish, cf. Rothstein 1993).

As a first observation, consider the structure of "minimal" complex constructions[5] in these languages:

> non-extraction : $[_S$ (NP$_{Subj}$) V [S]]
> wh-question, topicalization: $[_S$ NP/WH (NP$_{Subj}$) V [S]]

While the subject NPs are not syntactically necessary in these structures due to the possibility of null subjects, they are always present in the argument structure of the matrix verbs. The result is that in the minimal form of subject extraction, the extracted element is hierarchically separated from its own clause across a verb with a distinct subject in its argument structure. In this sense, one might say that the subject competes with another argument in the matrix clause. However, such competition normally does not occur when other functions are extracted, since usually there is no non-subject argument in the matrix clause in complex sentences.

This means that if such factors are in any way responsible for why certain structures are conventionalized while others are not, it is not surprising that subject extraction in certain cases may be restricted. Furthermore, since there may be only one Privileged Syntactic Argument (PSA) in each clause, there is a potential problem in case of subject extraction since there are two elements competing for the special status of controller of pivots, verb agreement, etc.[6]

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5. Minimal extraction refers to relativization, focusing or topicalization from the embedded clause in structures of the type [subject-verb-complement clause]. This is the "simplest" and presumably the most common type of extraction, and the one usually exemplified when extractions are discussed in the literature. Hawkins (2004: 177–180), for example, uses similar minimal structures to determine the Filler-Gap Domains which he claims can explain the Accessibility Hierarchy.

6. It is not clear what the effect would be in an ergative language, but in any case there is a possibly related effect in one ergative language, namely Basque. Thus, while subject and direct object extraction is unproblematic in this language, many speakers accept extraction of indirect objects only if there is not already an overt indirect object NP in the matrix clause (Saltarelli 1988: 16).

In languages such as Serbian, Hungarian and Quechua, where functional roles to a great extent are determined by case and agreement and less by rigid word order, it is perhaps not so surprising that the occurrence of two competing subjects in the matrix clause leads to problematic linking with their respective argument structure. The alternative strategies exemplified above may be seen as different methods to simplify such linking, since presumably embedded clause fronting and accusative shift both clarify to which argument structure the competing subjects belong. For example, the fact that an extracted subject in Hungarian receives accusative case can possibly be seen as a reflex indicating that this argument should not be interpreted as the subject of the matrix clause, or simply as a way to avoid competing PSAs (cf. Van Valin 2005: 259). Furthermore, the alternative strategies used in languages such as Swedish, i.e., complementizer deletion and insertion of resumptive pronouns, do not help at all in these languages. Similarly, arguing that there is a complementizer-gap effect in Russian, Pesetsky (1982: 318) points out that genitive subjects can be extracted, while nominative subjects cannot. It is possible that this effect has the same origin as the accusative shift in Hungarian, indicating that in a relatively free word order language, subject extraction may be restricted for other reasons than in English and Swedish.

Another issue concerns the controller properties of PSAs, i.e., the fact that an omitted embedded subject is normally linked by the matrix subject (Van Valin 2005: 94ff). It turns out that at least some null subject languages have restrictions on the coreference pattern between a matrix 3rd person subject and an embedded subject 3rd person affix, so that either they must be co-indexed (as in Serbian (25), Tijana Stajic, p.c.) or they cannot be co-indexed (as in Maʾdi (26), Blackings & Fabb 2003: 445):

(25) *Rekao je da je pojeo kolac.*
say.PST AUX.3 that AUX.3 eat.PST the cake
'He$_i$ said that he$_i$ ate the cake.'
'*He$_i$ said that he$_j$ ate the cake.'

(26) *ō-fō ámā ō-dī èbī ádjínī*
3-say that 3-cook fish yesterday
'*He$_i$ said that he$_i$ cooked fish yesterday.'
'He$_i$ said that he$_j$ cooked fish yesterday.'

Obviously, when a non-subject is fronted such coreference patterns are unaffected, but when a subject is fronted the situation is different. There are two potential problems: either the embedded subject affix must be co-indexed with the true matrix subject, thus blocking co-indexation between the extracted element and the embedded subject affix, or the subject affix must be co-indexed with a referent outside the sentence, also blocking such coreference. In any case, it is the property of a subject to govern co-indexation with an argument in the embedded clause that distinguishes it from other functional roles and which may lead to specific restrictions on subject fronting, as in the case of Maʾdi where embedded subjects, unlike embedded objects, must be questioned in situ (Blackings & Fabb 2003: 625–626).

An interesting parallel can be seen in the asymmetric behavior of passives and anti-passives. In a cross-linguistic perspective it turns out that in languages with passivization the actor is usually treated as a peripheral adjunct, while in languages with anti-passivization the undergoer is often completely unaffected (Van Valin 2005: 117). As an explanation for this distinction Van Valin argues as follows:

> Actor arguments are powerful syntactically and typically possess many controller and pivot properties, while undergoers typically do not. Hence, leaving an undergoer as a direct core argument, regardless of whether it is a macrorole or not, is unlikely to lead to confusions regarding the agreement controller, reflexive antecedent or pivot in certain constructions. On the other hand, having the actor remain a direct core argument leads to potential ambiguity with respect to reflexive control, control of missing arguments in complex constructions, etc. Treating an actor as a peripheral adjunct indicates clearly that it has lost the controller and pivot properties which accrue to the undergoer in the passive construction.

In my opinion, this explanation has a lot in common with the explanation I believe is relevant for restrictions on subject extraction in case- and agreement-based languages. The point is that, when a subject is extracted, there are suddenly two actors in the matrix clause which compete for control of the missing actor argument in the embedded clause. On the other hand, when non-actors are extracted there is no such competition, since the extracted argument does not interfere with the PSA properties of the matrix subject.

5. Subject extraction in subject languages

Summarizing the discussion so far, there seem to be a number of indications supporting the view that the restrictions on subject extraction seen in Germanic and Romance languages are of a somewhat different type than those found in Slavic and Non-Indo-European languages such as Hungarian and Quechua. However, in order to support the hypothesis that restrictions in Germanic and Romance are actually connected to the subject requirement, one would like to find languages in other families which show a similar correlation. First of all, it must be said that there is at least one language outside Europe which behaves like Norwegian, i.e., it has obligatory subjects but still shows no complementizer-gap effects. This language is Ndyuka (Creole, Suriname) which allows complementizer-gap structures and also makes use of expletive pronouns in subject position (Huttar & Huttar 1994). Consequently, like Norwegian, this language shows that if there is a connection between complementizer-gap phenomena and obligatory subjects it is not a deterministic correlation. However, studying the limited information available about extractions in non-European subject languages, it turns out that some very interesting data can be obtained.

In Koromfe (Gur, Burkina Faso), as in English and Swedish, expletive pronouns are obligatory in a number of contexts where there are no semantic subject arguments, as shown by the insertion of *gu* in (27). Furthermore, as shown in (28), the same element is here used as an obligatory resumptive pronoun in subject extractions, while no resumptive elements are needed in object extractions (Rennison 1997: 68, 22):

(27) *gu jãŋ   de jã   nɛ ke   sã   de bɛllaa.*
      it appear he mother for that tomorrow he come.PROG
      'It seems to his mother that he will come back tomorrow.'

(28) *ase   de bole ke   gu lebam   kãŋa?*
      what$_i$ he said that it$_i$ build.GERUND be hard
      'What did he say is difficult to build?'

Pronominals in Koromfe are usually described as being prefixed to the verb, but note that such pronominal affixes appear only if there is no other NP in the clause. That is, they are clearly not agreement markers but true subject pronouns. A similar situation is found in the unrelated West-African language Koyra Chiini (Songhay, Mali), where subjects are obligatory in all clauses with inflectable verbs (Heath 1998: 125). Heath provides the following examples showing that although there are no clear cases of expletive pronouns, even weather expressions such as (29) and (30) obligatorily contain a referential subject NP (1998: 366):

(29) *baana di   kar.*
      rain   DEF strike
      'It's raining.'

(30) *ñeleku   dam.*
      lightning be.done
      'It's thundering.'

Equally, as in Koromfe, whereas an extracted object leaves a gap in the subordinate clause in case of extraction (31), an extracted subject leaves an obligatory resumptive pronoun (1998: 201):

(31) *woo či maŋoro di   kaa ay baba har ay   ma   ŋaa.*
      DEM be mango DEF REL 1SG father say 1SGS SUBJU eat
      'This is the mango that my father told me to eat.'

(32) *boro   di kaa ay har a   ma   batu ey   dooti…*
      person$_i$ DEF REL 1SGS say 3SGS$_i$ SUBJU await 1SGO there
      'a person whom I told to (lit. 'said that he') wait for me there …'

Thus, in the subject extraction in (32) the resumptive element *a* must appear in order for the sentence to be grammatical. Note that this reflex is exactly parallel to English and Swedish subject extractions from clauses with obligatory complementizers (*if*, *whether*,

etc.) The main difference is that in these African languages subject extractions evidently cannot be saved by complementizer deletion in case of extraction from *that*-clauses. This, however, is in fact a possible escape hatch in versions of Arabic that require obligatory subjects in subordinate clauses and which also show restrictions on subject extraction of a type similar to English and Swedish, as argued in Kenstowicz (1989).

There are several conclusions to be drawn from an investigation of the typological data. First of all, the "pro-drop parameter", as it is stated in most generative analyses, does not seem to hold. That is, even though there may be a tendency for such a connection, as a model for explaining how speakers acquire languages with such ease in spite of limited input, the correlation hardly exists (cf. also the data in Gilligan 1987). Thus, we have null subject languages such as Italian, Portuguese, Maori, Hausa and Slave which allow complementizer-gap structures but we have languages with obligatory pronouns which also allow such structures, e.g., Ndyuka, Norwegian and Danish. In my opinion, however, the most important conclusion to draw is that restrictions on subject extraction may be of other types than those commonly referred to as complementizer-gap effects.

A particularly clear pattern can be seen if one compares the Swedish data with data from Serbian. As we have seen, restrictions on subject extraction in Serbian (as well as in Polish) are affected by whether the extracted subject interferes with the matrix subject or not, possibly related to whether there is potential ambiguity as regards argument linking. However, if one would assume that a similar explanation is valid in a language such as Swedish, the following facts would be very difficult to explain:

(33)   *Vem trodde   McEnroe skulle   vinna   turneringen?*
        who thought McEnroe would win   the tournament
        'Who thought McEnroe would win the tournament?'
        'Who did McEnroe think would win the tournament?'

(34)   *Vem trodde   att   McEnroe skulle   vinna   turneringen?*
        who thought that McEnroe would win   the tournament
        'Who thought that McEnroe would win the tournament?'

(35)   **Vem trodde   McEnroe att   skulle   vinna   turneringen?*
        who thought McEnroe that would win   the tournament
        'Who did McEnroe think that would win the tournament?'

What is surprising here is that although an overt complementizer can be used in (34) to resolve the ambiguity shown in (33), a similar use of a complementizer to render the alternative (extracted) meaning is instead completely ungrammatical (35). In my opinion, the only reasonable conclusion to draw is that the obligatory deletion of the complementizer in structures such as (35) cannot be explained by referring to the sort of argument linking problems that seem to be responsible for the restrictions in some Slavic languages.

As we have seen, the alternative subject extraction strategies in a number of languages show that restrictions on subject extraction seem to be quite a heterogeneous

phenomenon. Thus, languages such as Hungarian, Quechua, Polish and Serbian do not seem to react to the restriction in the same way as e.g., English, Swedish, Koromfe and Koyra Chiini. While there may be many factors involved in determining the exact nature of these phenomena, I would like to suggest that there is at least one important difference between these two groups of languages. This difference concerns whether they are typically case- and agreement-based with relatively free word order, or con-figurational with relatively rigid word order. Intuitively, it seems reasonable that in the former case the restrictions concern assignment of the correct functional role to the displaced element, whereas in the latter case the restrictions concern violations of fixed structural configurations.

Taking this view, it is fairly obvious why insertion of a resumptive pronoun satis-fies the subject requirement in subject languages, as in the case of subject extraction in Koromfe, Koyra Chiini and from Swedish embedded interrogative and *wh*-filler clauses. On the other hand, one must also explain why subject extractions are allowed in languages such as English and Swedish if the complementizer is deleted. A much more detailed discussion of these issues can be found in Löwenadler (2007), but the basic idea is that there is a generalized abstract syntactic construction for finite clauses in subject languages, which contains a subject and finiteness (a "fully specified" cat-egory, construction or template). The difference in acceptability between extractions with and without complementizers in English and Swedish can be traced to the com-peting motivations of generalization and economy. The gap strategy is motivated by principles of economy, more specifically to avoid having to add redundant material, for example in the form of resumptive pronouns (as in the theory of Hawkins 2004). As long as the resulting clausal complements of verbs and complementizers are still fully specified, this strategy may be generalized to different types of extractions (restricted at a particular cut-off point in the Accessibility Hierarchy of Keenan & Comrie 1977). If the clausal complements are not fully specified, a conflicting situation arises: either a new non-fully specified finite complement is allowed, or the gap generalization must be abandoned. By allowing verbs to combine with a local non-fully specified finite comple-ment an important generalization can be maintained, namely the one specifying that complementizers such as *that* and *if* always combine with fully specified complements. Importantly, if instead these complementizers were allowed to combine with non-fully specified complements the generalization as regards verbal combinatorial restrictions would not be maintained anyway, since lacking the obligatory subject, the resulting complement [Comp V_{Fin}] is still not fully specified. That is, it is more economical to release verbs from the local requirement of fully specified clausal complements than to release *both* verbs and complementizers from such a requirement.

Considering the issue from an RRG perspective, a reasonable approach would be to connect the complementizer-gap effect to a discrepancy between available tem-plates in the syntactic inventory, and the specification of the relevant subject extraction constructional schema (for a discussion of the role of constructional schemas in RRG, cf. Van Valin 2005: 131–135). In general, a template without an NP argument cannot

function as an independent core in English, due to the language-specific requirement that all cores in the language have a minimum syntactic valence of one (Van Valin 2005: 130). However, dependent cores may sometimes lack PSA arguments in cases of coordination or cosubordination,[7] where one PSA argument is shared by several cores (2005: 203). Furthermore, Van Valin (2005: 130) argues that, in English, the occurrence of an element in the precore slot reduces the number of syntactic arguments in the core by one, and that this language-specific property may override the restriction that all independent cores in the language have a minimum syntactic valence of one. In the approach presented here, the complementizer-gap effect is a result of the fact that *wh*-questions, topicalizations, and relativizations distort the templates defined in the language for canonical structures. The point is that the occurrence of an element in the precore slot may freely reduce the number of core arguments only if the resulting template is part of the syntactic inventory. In the specific case of subject extraction, however, the result is a construction which features a part that is not licensed by the syntactic templates of English.[8] This means that the constructional schema relevant for subject extractions cannot make use of the available syntactic templates, but must specify a non-general, idiosyncratic template. The complementizer-gap effect in English and Swedish appears as a result of the efficiency considerations described above. Since the relevant constructional schema must specify idiosyncratic templates, the structures with and without a complementizer are not automatically licensed, as in the case of other extractions. Thus, it is more economical to allow just one idiosyncratic syntactic template, [Core Core$_{reduced}$], in the conventionalized constructional schema, than having to allow the template [Core (PRCS) Core$_{reduced}$] as well as the template [PRCS Core$_{reduced}$].[9] In other words, in order for the structure *John I* [$_X$ *know* [$_Y$ *that died*]] to be grammatical, two idiosyncratic templates (X and Y) would have to be specified in the subject extraction constructional schema. By obligatorily deleting *that* in such structures only one idiosyncratic template, of the form [Core Core$_{reduced}$], has to be specified (allowing the constituent [*know died*] in the example above).

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7.   Van Valin (2005: 201) states that in cosubordination "the linked units are dependent upon the matrix unit for expression of one or more of the operators". An example is a sentence such as *Kim must go to try to wash the car*, where three cores are linked.

8.   In this solution, the fact that subjectless clauses are allowed after the relativizer *that* (as well as Swedish *som*) is accounted for by stating that relativizers in languages such as English and Swedish are much more flexible elements than what is often assumed. The immediate result is that *that* introducing relative clauses may occupy different positions depending on what is required to satisfy the available syntactic templates. For arguments supporting this claim, see a detailed discussion in Löwenadler (2007).

9.   [Core$_{reduced}$] is here taken to indicate an independent core template lacking a Privileged Syntactic Argument.

The result is that the constructional schema only allows for a structure without the complementizer. Note, however, that presumably this template is only part of the constructional schema used for subject extraction, and thus not part of the general templates in the syntactic inventory of English.

Finally, note that the explanation presented here implies that complementizers and *wh*-fillers make use of the same template and may occupy the same position, as in the Simpler Syntax model of Culicover & Jackendoff (2005: 145). This means that in English and Swedish, but not necessarily in all other languages, speakers have formed a generalized position used by complementizers and *wh*-fillers. Thus, unlike in the traditional analysis in RRG, the position reserved for clause-markers is used by coordinating conjunctions but not by subordinating conjunctions, which occupy the precore slot. In my opinion, the fact that subordinating conjunctions have combinatorial restrictions, while coordinating conjunctions do not, supports such an analysis. Furthermore, the suggestion here implies that *wh*-fillers are more flexible as regards position than is usually assumed in RRG so that, in English, a subject *wh*-filler may occupy a core-internal subject position if this is necessary to fill the relevant templates.

If one assumes that complementizer deletion and resumptive pronoun insertion are consequences of a general subject requirement, one would have to explain why there are languages such as dialects of Norwegian and Danish where no such effects appear. One way to explain these conflicting facts would be to acknowledge that there are two active conflicting generalizations. One such generalization states that extracted elements are not repeated in the canonical position (an economy-constraint), while the other one states that elements occupying the comp (or Precore) position combine with fully specified categories (containing subjects and finiteness features). In a language such as Swedish the second generalization has overridden the first one, whereas in certain dialects of Norwegian it is the other way around. What makes complementizer-gap phenomena interesting is that in languages such as English and Swedish there is no apparent functional explanation for their occurrence, such as restrictions on focus positions, processing-difficulties, ambiguities in interpretation, etc. That is, at first sight it might be difficult to see in what way complementizer-gap phenomena are functionally motivated. On the other hand, the languages or dialects which allow certain complementizer-gap structures, such as some Norwegian dialects, are the ones that actually *are* functionally motivated and thus perfectly natural. Thus, the fact that not all languages behave like English and Swedish is completely expected, given that functional considerations are relevant in languages. However, in order to explain why complementizer-gap phenomena turn up in *some* languages, we need to find a constraint which pulls in the other direction, i.e., away from the simple generalizations that the fronted element leaves a gap in its canonical position, and that a complementizer may mark the complement of the matrix verb. I believe that this other constraint is strictly syntactic in nature and concerns the availability of syntactic templates in a particular language.

6. Conclusions

Naturally, if a connection between obligatory subjects and complementizer-gap effects exists, we need some distinct way to explain restrictions on subject extraction in languages which allow null subjects, such as Hungarian and Imbabura Quechua. The peculiarities of languages such as English and Swedish show that the effect in these languages is very much determined by the choice of preceding element, e.g., whether it is a verb, a complementizer or a relativizer. This suggests some sort of local structural restriction which seems quite different from what we see in languages such as Hungarian, Imbabura Quechua and Serbian, where the restriction is unaffected by such changes. In these languages, on the other hand, the restriction is affected by the choice of case-marking of the extracted element, as well as by properties of the matrix subject.

I believe that the true cross-linguistic generalization concerning restrictions on subject extraction is to be found at a more abstract level than what is often assumed. Thus, in order to explain why subject extraction turns out to be problematic in a number of unrelated languages we need to acknowledge that the subject as the PSA has a number of properties which distinguish it from other arguments. Since a PSA is usually the only argument in minimal simple clauses and the only matrix argument in minimal complex clauses, two such relevant properties are the following:

a. The subject is the only argument which may be conventionalized as obligatory.
b. In minimal extraction the subject is the only argument whose functional role in the embedded clause cannot be carried over to the matrix clause without competing with the functional role of an argument of the matrix clause.

Considering the differences found between the restrictions on subject extraction in the investigated languages, I believe that (a) above is the cause of the restriction in subject languages such as English, Swedish, French, Koromfe and Koyra Chiini, where complementizers must be deleted or resumptive pronouns must be inserted. On the other hand, (b) above is the most likely cause of the phenomenon in languages such as Serbian, Polish, Hungarian and Quechua, where the alternative strategies used remove potential functional ambiguity. To explain the cross-linguistic data, I will suggest the following functionally determined constraints, which interact as competing motivations. Importantly, all these constraints are determined by considerations of economy or processing efficiency:

In favor of unrestricted subject extraction (filled box in Figure 1)

a. The primary extraction strategy in a language is generalized to functions to the left of a particular cut-off point in the Accessibility Hierarchy (SU > DO > IO > OBL > GEN).[10]

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10. The Accessibility Hierarchy is of course not an explanation in itself. Rather, the explanation is related to its motivation, which may be related to processing efficiency (Hawkins 2004) and/or pragmatic factors related to topicality (Fox 1987).

In favor of restricted subject extraction (unfilled boxes in Figure 1)

b. Avoid unmotivated use of idiosyncratic syntactic templates.
c. Avoid several controller (PSA) arguments in the same clause.
d. Avoid using the same case for two different arguments within a clause, and avoid using the same person/gender for two competing NPs controlling verb agreement.
e. Avoid extracting an argument across an intervening, hierarchically higher, clausal constituent containing an identical competing argument, i.e., an argument with the same functional role.

Argument relations determined mainly by word order ⟷ Argument relations determined mainly by case and agreement

Avoid unmotivated use of idiosyncratic syntactic templates	Primary extraction strategy generalized up to cut-off point in the Accessibility Hierarchy	Within clauses, avoid competing controller arguments
		Avoid extracting an argument across a clause containing a functionally identical argument
		Within clauses, avoid arguments with competing case (pers/gen)

Complementizer deletion
Resumptive pronouns ⟷ Subclause preposing
Case shift
Matrix subject sensitivity

Figure 1. Competing motivations relevant to subject extraction.

Figure 1 describes the way these constraints are related to each other, and how different types of languages are affected by them (where the first row represents *language type*, the second *competing motivations*, and the third the *structural consequence*):

Although the constraints are relevant in all languages, the constraint overriding principles thus tend to differ between languages. As indicated in Figure 1, presumably this is to some degree determined by whether the language assigns argument functions mainly by word order or by case and agreement. However, which constraints are most active in a particular language should in principle be revealed by the alternative escape hatch strategy used in extractions.

There is little reason to assume that the factors responsible for the typologically valid Accessibility Hierarchy do not apply in embedded clauses as well. Therefore, a reasonable assumption is that in line with the hierarchy, there is an implicational universal stating that the subject is the easiest element to extract from an embedded clause.

Any language which follows this implicational universal behaves precisely as expected, thus subject languages such as Norwegian, Danish and Ndyuka, as well as null subject languages such as Spanish, Maori, Slave, Basque and Maltese do not require much additional explanation. On the other hand, in order to explain why certain languages do not follow this hierarchy, other (functionally determined) constraints must be found. By studying the "alternative" grammatical constructions in these divergent languages, one may discover which constraints are involved in each particular language.

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Wari' Intentional State Constructions

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Wari', the last viable language of the Chapakuran family of Brazil and Bolivia, manifests a typologically and theoretically interesting construction for expressing intentional states. I refer to this construction as the Intentional State Construction. The special interest of this construction is that it simultaneously manifests properties of both words and clauses, yet seems difficult to subsume under common definitions of Complex Predicates, mixed categories, or within theories of syntax based strictly on endocentricity. It is argued that these constructions are handled straightfowardly by Role and Reference Grammar (Van Valin & LaPolla 1997), in which they are dominated by a non-projecting node (NUC) heading an exocentric unit, Clause.

1. Introduction[1]

In this paper, I want to explore a type of complex construction in the Chapakuran language, Wari', spoken in Western Brazil. I refer to this as the Intentional State Construction (ISC). The special theoretical interest of the Wari' ISC is that its predicator simultaneously manifests properties of both words and clauses (more neutrally, phrases) and thus provides insights into the relationship between syntax and morphology. The previous analysis of Wari' ISCs in EK (1997, 39ff henceforth EK) and Everett (1998) fails to account for ISCs because it is based on a simple "verbalization" or type-shifting

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analysis. This turns out to offer no account for the hybrid nature of Wari' ISCs.[2] This is because, as we see below, though Wari' ISC predicators closely parallel verbs in some of their behavior, they are like clauses in other aspects of their behavior. If they were just zero-derived verbs, as per EK's analysis, we would predict that their behavior should completely parallel the behavior of verbs. But this is false. Wari' ISCs not only bear on an interesting descriptive issue of an endangered Amazonian language, their analysis offers support for the theory of phrase structure proposed in RRG.

This paper is organized as follows. First, I survey the basic surface syntax of Wari'. The next section examines in detail the empirical focus of this paper – the Wari' Intentional State Construction. In this section both the functional and the formal properties of ISCs in Wari' are considered. In section 4 I provide an analysis of Wari' ISCs within Role and Reference Grammar (RRG). I argue that RRG accounts for Wari' ISCs by generating their predicators directly under the independently necessary category of Nucleus. The conclusion discusses implications of my analysis for linguistic theory and for the role of morphology overall in the grammar of Wari', i.e., why Wari' has such an impoverished morphological system, so uncommon for American Indian languages. I argue that this follows from the theory of ISCs developed in the body of the paper. A summary of the paper's major conclusions ends the text.

The abbreviations used in the glosses of this paper are: *1P* "first person plural", *3s* "third person singular", etc.; *RP/P* "realis past/present tense"; *IRR* "irrealis"; *PASS* "passive"; *N* "neuter gender"; *PINCL* "plural inclusive"; *PEXCL* "plural exclusive"; *EMPH* "emphatic"; *PROX: HEARER* "proximate to hearer"; *M* "masculine gender"; *RF* "realis future"; *REM* "remote"; *REFL* "reflexive"; *PROX* "proximate"; *PREP* "preposition"; *F* "feminine" (the genders and tenses are combined in glosses, e.g., *N*: *RP/P* = "neuter gender, realis past & present tense"). VIC, verbal inflectional clitic, and INFL, clausal inflection, are terms used throughout EK (1997). They refer to the clitics that follow the verb and sentence-initial modal particles and WH words, respectively. The VIC will usually manifest tense, mood, voice, and person. The INFL element agrees in gender and number with the modal or WH word and also manifests tense.

The IPA values for Wari' orthographic symbols are straightforward, except in a few cases. In the following, the IPA symbol is given in //'s and the corresponding orthographic symbol (orthography developed by New Tribes missionaries) in single quotes (see EK (1997, 395–406) for details). /p/ 'p', /t/ 't', /tB/ 'tp', /k/ 'c, qu [as in Portuguese, DLE]', /kʷ/ 'cw', /ʔ/ ''', /tɓ/ 'x', /h/ 'h', /hʷ/ 'hw', /m/ 'm', /mʔ/ 'm', /n/ 'n', /nʔ/ 'n', /ɾ/ 'r', /w/ w', /y/ 'j', /a/ 'a', /e/ 'e', /i/ 'i', /o/ 'o', /ø/ 'ö', /y/ 'u'.

2.   That analysis, discussed in more detail in Everett (1998), is roughly just the addition of V-brackets to a sentence used as an ISC predicator: (i) $[_{S}...] \rightarrow [_{V}[_{S}...]]$. By this analysis, a sentence can be used as a verb just in case it undergoes this derivation, which would be marked by stress (i.e., the S would subsequently be stressed as a V, not an S).

2.   An overview of Wari' syntax and the Intentional State Construction

2.1   Inflection

Tense, voice, person, number, and gender are all marked in Wari' clauses and are manifested in two distinct clausal positions. In verb-initial sentences, all four of these categories appear on a *Verbal Inflectional Clitic*, VIC, immediately following the verb. This is illustrated in (1)–(2) below, as well as (3)–(5).

(1)   Quep <u>na</u>   -in xirim te   pane   ta.
      do   3s:RP/P -3N house father:1s REM:PAST EMPH
      'My father made a house long ago.'

(2)   <u>To*mi*'</u> <u>ta*in*</u>ᵢ   [*ca*   *mi*'   *ne*]ᵢ. ta'-*in*
      speak 1s:RF-3N n:RP/P give (die) POSS:1s
      'I will tell you [about my death].' (lit. '… about my giving')

However, it is subject to the constraint that it must occur after the first constituent in the sentence, which offers interesting insights into Wari' phrase structure, as we see below. When the verb is not sentence-initial, the tense must follow the first constituent preceding the verb, as in (6)–(8) below.

The VIC agrees with both the subject and object. Example (2) illustrates that the VIC also agrees (neuter gender) with embedded sentences, when these are verbal arguments (shown by cosubscripting). It also illustrates the normal postverbal position for an embedded clause. Example (2) also shows that each word of an embedded sentence is stressed separately. (Stress is indicated by italics. The acoustic correlate of stress in these examples is loudness. See Turner (2006) for a fuller documentation and analysis of stress and intonation in Wari'.) Each word of the subordinate clause has relatively equal length. This latter fact is important because it provides us with a diagnostic for identifying the predicate distributionally, apart from meaning. That is, the material immediately preceding the VIC is stressed like a simple word. Further, the stress preceding the VIC is the default primary stress of the sentence as a whole. This in turn suggests a default form of predicate stress (Van Valin & La Polla (1997, 206ff), independently confirmed for Wari' by Turner (2006, 16ff).

2.2   Constituent order

Wari' is a VOS language. The verb always precedes the objects, which in turn precede the subject. However, the VOS ordering is manifested in somewhat different ways by two basic types of root sentence. The two types of sentence are simple V-initial sentences and sentences which begin with a word or phrase indicating mode or illocutionary force – what EK (p43) label COMP(lementizer) sentences and sentences in which the verb/predicator is the initial constituent. Examples (3) and (4) show verb-initial sentences while (6)–(9) illustrate sentences with one of the small set of preverbal

modal markers.[3] In both types of sentence, tense is marked in the second position of the sentence, i.e., immediately to the right of the first constituent. As stated, voice and agreement features appear together on a postverbal clitic (VIC) in V-initial and ISC-predicator clauses. Tense generally also appears on the VIC when the VIC is in sentence-second position. In what follows, we first look at VICs in verb-initial sentences, then in sentences which are not verb-initial. The VIC is underscored.

Verb-initial sentences[4]

(3) Ten   <u>ta</u>   wao'.
     weave   passive:3s   type of basket
     'Baskets are woven.'

(4) Mi'   <u>non   -on</u>   con   hwam hwijima' mon tarama'.
     give 3p:rp/p -3pm   prep:3sm   fish   children collective man
     'The men gave the children fish.'

Example (4) illustrates that Wari' has properties of a primary object language (Dryer 1986; Guerrero & Van Valin 2004): with a three-argument verb, the recipient is the object and the theme is an oblique object; a literal translation of (4) would be "the men gave the children with the fish".

Let me explain in more detail why I am here referring to inflectional morphemes (*tain, ta,* and *nonon,* in (2)–(4), respectively) as clitics rather than affixes.[5] EK (1997, section 2) analyse these as clitics rather than affixes for several reasons. First, they regularly bear stress on their final syllable, as does the verb. Therefore, if they were treated as verbal suffixes, then this would imply that all verbs must bear two stresses, one on the agreement-tense morphology and another on the last syllable of the verb stem. Yet, multiple word stresses are otherwise unattested in Wari'. Second, the VICs do not undergo Vowel Harmony with the verb, though affixes normally do undergo Vowel Harmony with their host morpheme. Third, VICs can attach to categories larger than words, as shown in this paper. That is, they attach to both ISC predicators, which have the form of sentences, as well as verbs; this shows that VICs are not lexically restricted to a particular morphological level of host, unusual behavior for affixes, but common behavior for clitics (see Everett (1996), among many others). Fourth, they do not

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3.   EK use the term "preverbal modal/mood markers" for the words in question because they are found preceding the verb to signal non-indicative or negative sentences. The words themselves do not necessarily belong to a special lexical class of modals.

4.   One might legitimately ask what I consider the syntactic arguments to be in Wari' when lexically required arguments are not expressed as full NPs. This is important because in Wari', like most American Indian languages, full NPs are relatively rare in discourse. When they are absent, following RRG (see VVLP, page 34ff), I analyze the agreement markers on the VICs to be the arguments. That is, I do not hypothesize the existence of null nominals, e.g., Chomskyan "empty categories".

5.   VICs mark the person, number, and gender subjects and objects, in different combinations. VICs are discussed in detail in EK, section 2.1.3.6.

interact morphophonemically in any other way typical of affixes with any word adjacent to them.[6] In summary, they manifest behavior normal for clitic-groups.

Strings of verbs are analyzed as compounds (EK, 379ff) Wari' verb morphology is notable for its very productive use of compounding. I offer an example of this here, because the phenomenon turns out to be important for the central claim of this paper, i.e., that there are deep parallels between verbs and ISC predicators. The VIC follows the last member of the compound. Stress is placed on the last syllable of the compound, shown in (5) by italicizing the stressed syllable *wi*:

(5) Pan' corom mama' pin   'a*wi*   nana
     fall:s enter go:P   completely completely 3P:RP/P
     'They all fell into the water.'

Let us now consider another type of Wari' sentence – sentences with preverbal material. When the preverbal position is filled, as in (6)–(9) below and many others, it is immediately followed by a different clitic (labelled Infl by EK, 8ff.), marking tense and agreement with the gender of the item in sentence-initial position, rather than with subject or object per se.[7] Example (7b) shows that in an interrogative sentence, more than one word may precede tense).

(6) Ma'   co   tomi' na?[8]
     that:PROX:HEARER M/F:RP/P speak 3S:RP/P
     'Who is speaking?'

(7) a. Ma'   co   tomi' ca?
        that:PROX:HEARER M/F:RP/P speak 3SM
        'Of whom is he speaking?'

    b. Ma'   carawa ca pa'   caca mon   tarama'?
        that:PROX:HEARER animal N:RP/P kill 3PM collective man
        'What thing/animal did the men kill?'

Again, example (7) shows that tense is the second syntactic constituent, rather than merely the second word, in the clause, because it follows [*ma' carawa*], rather

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6. Other phonological evidence includes Vowel Harmony. Vowel Harmony is identified by EK (1997, 377ff) as an exclusively word-internal process, as illustrated in (i)–(iii):

    (i)   *cotere'* (co-te-'iri)   →   [kot**e**reʔ] 'our father'
    (ii) *coturut* (co-te-'urut)   →   [kotʏrʏ^t]
    (iii) *cote* (co-te) + *hwe*   →   [ko**te** hʷe], *[kote**h**ʷe]

7. Wari' has three genders: masculine, feminine, and neuter. As shown in examples in the text, nonreferential words and phrases, such as "why", subordinate clauses, and "not" trigger neuter agreement.

8. Example (4) is interesting because it illustrates that questioning the subject of the sentence requires tense in second position, to the immediate right of the question word, and also immediately to the right of the verb. WH-questions of subjects require that tense be expressed twice in the sentence. This, as (6)–(9) show, is not true of any other questioned constituent.

than simply following *ma'*. This is significant, because in verb or ISC-initial sentences, tense either follows the verb or ISC predicator, never the verb + object(s), this offers some support for the RRG contention that VP is not a syntactic constituent. Otherwise, we lose the simple generalization that tense follows the first constituent.

(8) Ma'   *ca*   para 'aca ca pije ma'?
     that:PROX:HEARER N:RP/P why cry 3SM child that:PROX:HEARER
     'Why is that child crying?'

(9) 'om   *ca*   mao   ca.
     not:exist   N:RP/P   go:SG   3SM
     'He did not go.'

As we see in the above examples, following the first constituent and the tense marker, the verb is the next constituent, followed in cases where the verb is non-initial (except subject questions), by a tenseless agreement VIC. That is, when the Verb is initial in the sentence then the VIC is tensed. Otherwise, except when it follows ISC predicators or in clauses where the subject noun phrase is questioned, it is tenseless. As we will see in the next section, the fact that the VIC following an ISC predicator is obligatorily tensed suggests that this predicator is behaving like the main verb, rather than like a "fronted" or otherwise "dislocated" constituent.

3.   Intentional State Constructions

3.1   The function of Intentional State Constructions

Many Amazonian languages report on others' thoughts, character, reactions, and other results of intentional states by means of quotatives, i.e., literally putting words in people's mouths. Wari' also uses quotatives for these purposes. But in Wari' the range of uses is much larger than I have seen for other Amazonian languages (with the possible exception of Kwazá, as argued convincingly by van der Voort (2002)[9]). Most subtypes of Wari' ISCs seem to derive from quotatives, the basic form of which is illustrated in (10).

(10) Ma'   co   mao na   -in$_i$ Guajará$_i$ (Brazilian city)
      that:PROX:HEARER M/F:RP/P go:SG 3S:RP/P -3N Guajará

      na$_j$ -nam$_k$ 'oro   narima$_k$' taramaxicon$_j$.
      3S:RP/P   -3PF   collective woman   chief
      ''Who went to Guajará?' (said) the chief to the women.'

_____

9.   Subsequent to EK, van der Voort (2002), based on research from 1995–1998, published a very interesting article on quotatives in Kwazá, an unrelated language but one also spoken in the state of Rondonia, Brazil. Kwazá quotatives share many properties with Wari' ISCs, suggesting that this interesting construction may be an areal characteristic or that there was some previous (there is none now) contact between Wari' and Kwazá speakers.

However, unlike in most languages, perhaps, in Wari' the verb "say" is missing entirely.[10] I consider this quotative use of ISCs to be their basic meaning because (i) it is the most frequent; (ii) many other types of ISCs can be interpreted as quotes, at least figuratively; (iii) it manifests the basic structure that some of the others appear to use as a baseline for deviation.

There are some significant differences between ISC types and subtypes. I only cover some of these here. The reader is therefore urged to consult EK (1997, 39–158) for details. What EK refer to as "verbalized sentences" are sentences in which the predicator is manifested by one of a large set of derived predicator types. The predicator of such sentences can often, but by no means always, be interpreted as embedded speech. There are two groups of verbalized sentences in the analysis of EK, which I also assume here. The first includes direct speech, future tense constructions, supposition, and purpose. The distinguishing character of this group is that their derived predicators have the form of a quotation. The second group includes conditional, desiderative, refusal, sequential, and comparative sentences. These differ from the first group in that either the embedded portion would not be a well-formed sentence on its own, or the form of the construction as a whole is not that of a quotative. Some sample sentences and proposed structures for them are given in (10), given above, and (11)–(13). In what follows, I use the node "predicator" as a neutral term for lumping together verbs and ISC predicators. This will be relabeled as NUCLEUS following our introduction to RRG in section 4. Also, the grammatical relations (subject, object, oblique object) in the tree diagrams are informal labels and will be changed in the RRG trees in section 4.

(11)

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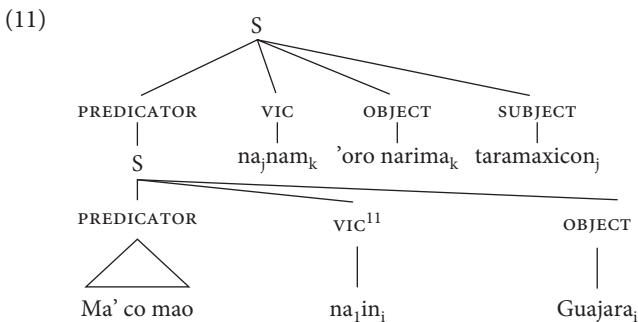
10. Some English dialects have quotatives without a overt quotative verb, e.g., "to say": "I mean, he's like "Don't even go there", so I am like "Fine, forget it, then". Arguably, though, the word "like" plays a function similar to a quotative verb".

11. Vic is not a technical term of RRG and would label a tree in "official" RRG format. However, I use this term for now to better enable the reader to follow the discussion.

In (11) we see an embedded PREDICATOR, *Ma' co mao* "who go", which is followed by the agreement-tense clitic complex, *nain*, where *na* agrees with an understood masculine subject (not part of the structure) and **in** agrees with *Guajara*. The literal meaning of this most embedded clause is "Who went to Guajara", where Guajara is the object of the verb *mao*. This is in turn embedded in a larger structure (lacking a verb), "he-to-them (fem) Chief women". It means literally "Who went to Guajara (said) Chief to women". Though a verb of saying is necessary to the English translation, it is not necessary in the Wari' clause (more on this below). Example (12) shows a simpler ISC construction. This one is used to communicate future tense (see the next section) but has the form, roughly, of a quotative.

(12)   Cao' xi'   carawa nana   hwijima'.
       eat   1PINCL:RF   animal 3P:RP/P children
       'The children will eat food.' (lit: '"We will eat food", the children (say).')

(13)

PREDICATOR — VIC — SUBJECT

PREDICATOR
│
S
├── PRED ─── cao'
├── VIC ──── xi'
└── OBJECT ─ carawa

VIC
│
nana_i

SUBJECT
│
hwijama'_i
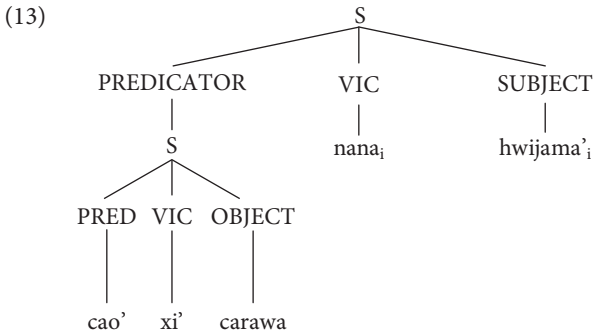
The crucial observation with regard to VICs and phrase structure from this discussion is that VICs are obligatory and can attach only to the verb or to the ISC predicator. Although tense placement alone merely shows that ISC predicators are constituents, VIC placement shows something more – the VIC only attaches to the predicator – either the verb or the ISC predicator, showing an especially close functional and formal relationship between the two. Capturing this relationship is the focus of this paper. VICs, unlike tense, are not second position clitics (see EK (312ff) for extensive discussion), as seen in examples like (7b), where the VIC, *ca* "3SM", is the fifth (or fourth, depending on the analysis of the particular structure) constituent of the clause, immediately following the (compound) verb, *para 'aca* "why cry". Example (10) shows the basic form of a quotative.

3.2   The form of Wari' ISCs

3.2.1   *Overview of Wari' ISCs*

When the properties of ISCs are examined in detail, it turns out that they share two very different types of properties. First, they pattern as if they were single words, as

discussed throughout this section but especially in subsection 3.2.3. But, second, they also manifest properties of phrasal syntax. For the types of ISC examined so far, I will lay out the structure of each type as a simple additive formula; for new types introduced in the discussion, I will put the type and formula in a footnote. Reference is made in parentheses to the constituents of the ISC predicator iff there are special restrictions on its form. Otherwise it can have the form of any independent clause. The sentence in (10) is an example of a *Direct Speech* ISC; the function and formula are given in (14).

(14) a. Function: The function of the Direct Speech ISC is to express directly cited material.

  b. Structure = ISC predicator + Tensed VIC + Optional arguments

The example in (12) is a Future Tense ISC; its function and formula are given in (15).

(15) a. Function: The function of the Future Tense ISC is to express an individual's intention to carry out a future action. This ISC type conveys a greater sense of the knowledge of the reportee's motivation than does a simple morphological future. It is more commonly used than the morphologically simpler future tense markers in Wari' (see EK, 318ff).

  b. Structure = ISC predicator (verb + first singular or first plural inclusive realis future VIC + optional object or adjunct) + realis past/present or realis future VIC + optional arguments

Note that the Future Tense ISC predicator's embedded predicator must contain a first person VIC. This is a restriction peculiar to the Future Tense ISC.

3.2.2 *Compounding of Wari' ISCs*

Interestingly, ISCs can be embedded in or combined with other ISCs and verbs. This is a very important observation because multiple embeddings are otherwise prohibited in the language, even with the verb "to tell/say", illustrated in (16a) and (17). Sentence (16a) is ungrammatical because it has two embedded clauses, whereas (16b) is fine:

(16) a. *[$_S$Tomi nana$_i$ [$_S$ 'i' 'iri' mapac$_S$]
    speak 3P:RP/P tear 1PINCL:RP/P corn

    [$_S$ 'ep xi' capam'$_S$] 'oro narima'$_{iS}$].
    grind:corn 1PINCL cornbread coll woman

    'The women said 'we shucked corn' (and/so that) 'we will make cornbread'.'

  b. [$_S$ Tomi' nana$_i$ [$_S$ 'i' 'iri' mapac $_S$] 'oro narima' $_S$]
    speak 3P:RP/P tear 1PINCL:RP/P corn coll woman
    'The women said 'we shucked corn'.'

(17)
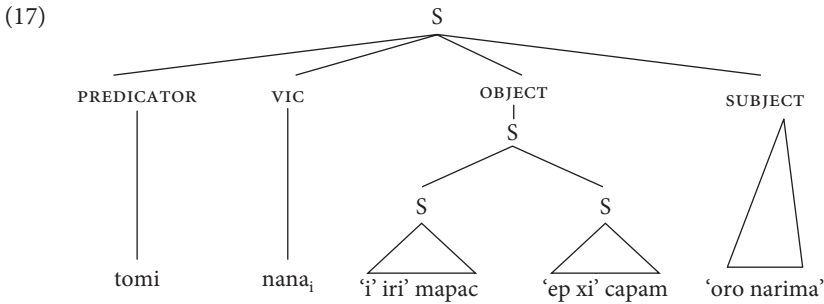
Example (16a) has two Ss embedded (see (17)) and so is ungrammatical. (16b) is fine, however, since it has only one level of embedding. This is quite different from what we find with multiple ISC embeddings, since the latter are grammatical and very common, just as compounding of verbal predicators is common. This is exemplified in (5) above and (18) below:

(18) [PRED [PRED [PRED Pan' PRED] [PRED   'am   ta' PRED] PRED] tara xa' PRED]
      fall:S   be:LOST:S 1S:RF 3S:RF   younger:brother:1s

      ma' PRED]   'ina
      that:PROX:HEARER 1S:RP/P

      'I (say) my younger brother was going to get lost.' (lit. 'I (say) my younger brother will probably (say), 'I will get lost".)

The tree structure of the example in (18) is given in (19):

(19)
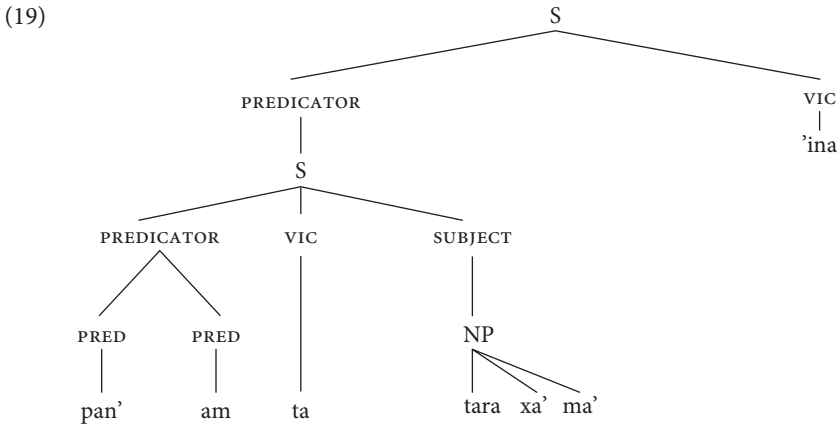
An additional example of ISC predicators and compounding is given in (59), an example of Direct Speech and Sequential[12] ISCs.

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12. Function: These are used to indicate immediate temporal sequence or progression. Structure = ISC predicator (verb + *ac* "travel" or *mao* "go" + tenseless/reflexive VIC + (optional)

(20)   Pi'am to   xi'   -in ca'   'e'   'ac   cacama na
       sleep be:at:PL 1PINCL:RF -3N this:n EMPH travel 3PF   3S:RP/P
       "We will sleep here then', they (said)." (Literally:'It was (said) 'We will sleep
       here then.'")

(21)
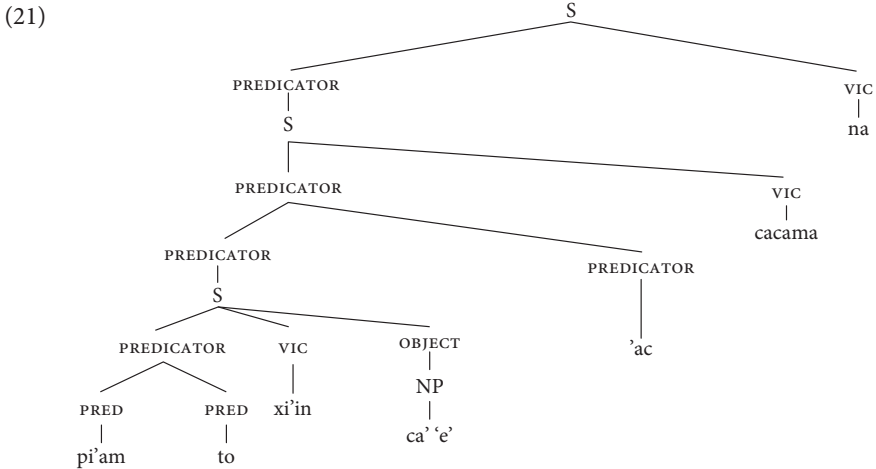
As these examples show, in spite of otherwise prohibiting embedding, recursion of (both subordinative and iterative) ISC structures are common in Wari'. This asymmetry in the distribution of embedded clauses, based on their function as argument clauses vs. predicator (ISC) clauses needs to be accounted for. The proposal of section 5 below is that predicators in Wari' may combine or be subordinated, according to certain constraints of RRG.

3.2.3 *Mixed properties*
Let us turn now to consider in more detail the mixed properties of these constructions, beginning with their word-like properties. These are summarized in (22):

(22)   Word-like features of ISC predicators:

   a.   The predicator occurs in the clausal position otherwise occupied exclusively by the verb.

   b.   Only the last syllable of the predicator carries stress, as though it were a single word (see (25) below).

   c.   The final syllable of the ISC predicator bears default primary sentence stress, just as the verb does in other sentence types.

   d.   The predicator of an ISC may undergo predicational modification like a verb.

Object NP + (optional) postverbal modifier *ma'* "that: proximate: hearer") + third singular tense VIC + (optional) matrix argument and adjunct NPs.

   e.   The predicator can undergo compounding just like any other verb.

   f.   There is no other potential predicator/verb in the matrix clause other than the ISC predicator, i.e., it seems to be *the* matrix predicator.

   g.   ISC predicators are the only examples of multiple clausal embeddings in the language, but combine in the same position as the verb combines with other verbs (clause-initial position). And ISC predicators also combine with other verbs, just as all verbs do.[13]

Let's take each of these up in more detail. First, (22a), Wari' ISC predicators behave like words with respect to sentence constituent order. As all the examples in this paper illustrate, Wari' sentences may begin with either a mood marker (i.e., a sentence-initial, preverbal word which indicates interrogation, negation, or other non-positive or non-indicative mood), a verb, or an ISC predicator. The only material that may precede the verb or the ISC predicator is a "mood marker". The second constituent of the clause is always tense. When a verb is in initial position, the tense is marked on the postverbal VIC, again indicating perhaps that VP is not a constituent, as per RRG. But when a mood-marker is in initial position, then tense may appear on its own or in conjunction with a preverbal agreement morpheme which indicates the gender of the sentence-initial mood marker (e.g., neuter for "why" or "not", masculine for "who" masculine or feminine for "who" feminine, see examples (6)–(9) above). If we treat ISCs as though they occupied the same structural position as the verb, the initial statement of Wari' constituent order in (23) could be simplified to that in (24):

(23)   Wari' constituent order:

   a.   Wari' sentences begin with a verb, an ISC predicator, or a preverbal mood marker;

   b.   The VIC always follows the verb or the ISC predicator in the Wari' sentence.

   c.   Tense is always placed in second position in the sentence.

(24)   Wari' constituent order, simplified:
   a.   Wari' sentences begin with a predicator or a mood marker;
   b.   VICs follow the predicator.
   c.   Tense is always placed in second position in the sentence.

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13.   A possible lack of correspondence between verbs and ISC predicators is that I have no evidence of causativization with ISC predicators. But this is not a problem for my account for a couple of reasons. First, as the discussion preceding (77) below indicates, preverbal modification of ISC predicators mimics the formal expression of causativization in the language. So, the absence of causative interpretations in our data could be an accidental gap or the absence could be due to a semantic constraint unrelated to clause structure per se. Second, I am not predicting complete parallelism between verbs and ISCs in any case. EK predict that. I predict by the account here only a partial parallel, since the ISC predicators are not verbs. I am not claiming that ISC predicators *are* verbs. They and verbs are both dominated by a "predicator node".

Wari' ISC predicators are stressed like single words, (22d) and (22e).[14] The Wari' stress rule is given in (25), taken from (EK (1997, 416)). Stressed syllables are indicated by italics, in (26)–(29):

(25)   'Within the sentence, the final syllables of major lexical categories are stressed. Primary stress in the sentence normally falls on the final syllable of the verb, with final-syllable stress on other lexical categories interpreted as secondary stress.'

Stress in matrix clauses is illustrated below, with stressable constituents – words and ISC predicators – in brackets.

(26)   [*Quep*] [na   -*in*] [xi*rim*] [*te*]   [pa*ne*]   [*ta*].
       do   3s:RP/P -3N   house   father:1s REM:PAST EMPH
       'My father made a house long ago.'

(27)   [*Ten*]   [*ta*]   [*wao'*].
       weave   PASS:3s   type of basket
       'Baskets are woven.'

(28)   [*Mi'*] [non   -*on*] [*con*]   [*hwam*] [hwiji*ma'*] [*mon*] [tara*ma'*].
       give   3P:RP/P -3PM   PREP:3SM   fish   children   coll   man
       'The men gave the children fish.'

(29)   [Hwara' 'opa   ta*ra* ma']¹⁵   [*hun*]   [pan*xi* -*ta'*]?¹⁶
       big(SG) strength-1s 3s:RF that:PROX:HEARER hwe-on 2P:RP/P-3SM child -1s
       'Do you think my son is strong?' (lit:'Do you (think) of my son, 'He is probably strong'?')

Looking at stress placement in non-ISC subordinate clauses, we see that stress in subordinate clauses is placed on the last syllable of every grammatical word, just as in matrix clauses (but the first member of a compound word, as **'on** "whistle", in (31), is also not stressed).[17] See also (2).

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14.   A previous reader of this paper suggests that stress in Wari' might refer to X' (i.e., categories intermediate between words, X^0, and maximal phrases, X^{Max}, in the X'-system). However, that would be an ad hoc move since the category X' is neither the target of the stress rule for any other category, nor is X' otherwise needed to my knowledge in the grammar of Wari'. See section 5 for further discussion of X' theory in light of my findings here. Indeed more recent work, such as that of Carnie discussed in this paper, has sought to eliminate X' entirely from the theory.

15.   *ma'* is one of a small set of stressless particles, so is not stressed by rule (68).

16.   *Supposition* ISC: Function (EK, 63ff) – Supposition ISCs are used to express mistaken speculation or expectation of the speaker. Structure = ISC predicator (verb + third singular or third plural realis future VIC + object OR subject + postverbal modifier *ma'*) + realis past/present VIC + (optional) arguments.

17.   Wari' stress has not been fully studied in relation to intonation, focus structure, its phonetics, or other areas of the grammar. However, the basic rule given in the text accurately predicts the basic placement of loudness in the examples.

(30) [$_s$ Querec *wet*   na   -*in* [$_s$ *ca* ma*qui' ne* capija -*con* Co*wo'*].
       see   take:care:of 3s:RP/P -3N [RP/P come   3N mouth -3SM M:name
       'He paid (close) attention to where Cowo's voice was coming from.'

(31) [$_s$ 'On *'ac   ca   na*   [$_{NP}$ wa*ri'* [$_s$ *co   'om   pa'   quem*]$_s$]$_{NP}$]$_s$.
       whistle travel 3SM 3s:RP/P person   M/F:RP/P not:exist kill ref
       'Then a person whistled who did not kill.'

So ISC predicators, because they bear only a single stress, are not stressed like other subordinate clauses. Accordingly, in ISC predicators, the individual words are dramatically shortened. In addition to individual constituent stress, Wari' also has a primary sentence stress, (22c) (Turner 2006). This primary stress is always placed on the final syllable of the verb or the ISC predicator. If the ISC predicator is analyzed as the verb, or if the verb and the ISC predicator can otherwise be collapsed into a single category, e.g., predicator (or NUCLEUS, see section 4), then primary stress placement can be stated without a disjunction.

Another word-like characteristic of Wari' ISC predicators relevant here is pre- and postverbal modification, a type of verb-compounding, (22d). As EK state (p. 139), "The notion of simple adverbial modification is expressed by verb compounding. What we call pre- and postverbal modifiers (PVMs) immediately precede or follow a verb root, producing a compound verb." The distinguishing characteristic of verbal modifiers is their inability to occur as simple, noncompounded verbs. This turns out to be quite important for my analysis because PVMs are otherwise strictly limited to verbs and may not co-occur in other circumstances with nonword-level categories. The reader is referred to EK (139ff) for more details on verbal modification in Wari'. An example of postverbal modification is given in (29) above. It is important to remember that pre and postverbal modifiers never appear as independent verbs and that they only appear in compounds. Thus when they occur with ISCs, I argue that the ISC predicator must be seen as a non-phrasal element, the left member of a morphological compound, (22e).

Another important fact about ISC constructions is that they have no verb, (22f) and (22g). Unless we understand the content of the intentional state as the predicator of the sentence, ISCs lack predication, an unlikely conclusion. In this sense, ISC predicators behave like verbs, the major motivation for the type-shifting analysis of them in EK as "verbalized sentences".

Let us now consider sentence-like characteristics of ISC predicators, summarized in (32):

(32)   Sentence-like characteristics of Wari' ISC predicators

   a.   Group One ISC predicators have the structure of fully productive clauses or sentences, manifesting internal WH-questions, focus structures, and tree-structures typical of clauses and sentences.

   b.   All ISC predictors are subject to constraints on reference ((81) and (86)) relative to the main clause which would otherwise violate the "anaphoric island constraint" (Postal 1969).

The properties in (32) have not been accounted for by any previous analysis. The simultaneous sets of word and sentence properties are why the analysis proposed in EK is inadequate. Since EK analyses Wari' ISCs as verbs deriving from sentences, they should have only properties of words, not phrases. The EK analysis fails to predict their *mixed* properties.

Consider first (32a), i.e., that these predicators have the internal syntax of fully productive clauses. That is, Group One ISCs are well-formed clauses on their own. This means that they are not modified syntactically to "fit" into the embedded predicator position. Property (32b) indicates that their sentential properties are not inert, i.e., they have not been type-shifted, nominalized, verbalized, etc. They are constrained to interact referentially with constituents of the main clause.

To see this, consider first the restriction in (33):

(33) **Asymmetrical binding constraint**: an NP in the ISC (i.e., embedded) predicator can*not* be referenced on the matrix VIC (or, indeed, in any way in the matrix clause), but a matrix NP can be referenced on the ISC VIC.

This constraint is significant because, although an NP in an ISC cannot be referenced on the matrix VIC, an NP in the matrix clause of an ISC may be referenced by either or both the matrix and embedded VICs. This binding constraint is asymmetrical in the sense that a higher nominal or affix cannot bind a lower NP (this formulation skips some technical details, but none that are crucial for the present exposition).[18] It is important, again, to recognize that this constraint is based on the referentiality of the NP in the embedded clause. Examples are:

(34) [Ten   ta'   wi] ma?
      weave 1SG:RF   mat 2SG.RP/P
      'Are you going to weave a mat?' (lit: "I will weave a mat' you (say).'

(35) a. *[Ten   ta'   wi] ma   -in?
          weave 1SG:RF mat 2SG.RP/P -3N
          'Are you going to weave a mat?' (lit: "I will weave a mat' you (say).'

      b. [Ten   ta']   ma   -in?
          weave 1SG:RF   2SG.RP/P -3N
          'Are you going to weave something?' (lit: "I will weave somthing' you (say) with regard to it.'

(36) [Cao' xi'   carawa] nana   hwijima'.
      eat   1PL.:INCL.:RF animal   3PL.:RP/P children
      'The children will eat the food.' (lit: "We will eat the food.' the children (say) of it.')

_____

18. This is clearly reminiscent of the "Binding C" constraint of much work in generative syntax, supporting that constraint.

(37) a. *[Cao'   xi'   carawa] nana   -in hwijima'.
        eat   1PL.:INCL.:RF animal 3PL.:RP/P -3N children
        'The children will eat the food.' (lit: "We will eat the food.' the children
        (say) of it.')

    b. ?[Cao'   xi']]   nana   -in hwijima'.
        eat   1PL.:INCL.:RF 3PL.:RP/P -3N children
        'The children will eat.' (lit: "We will eat something.' the children (say) with
        respect to it.')

As (35b) and (37b) show, the matrix clause does allow its VIC to reference an
unspecified embedded object, in the sense of "with regard to", though such examples
seem strained (native speakers accept them only if they can think of a sensible context
and must think hard to do so). But matrix clauses may never have object agreement for
an overt NP embedded object. Such examples indicate that nominals within ISC pred-
icators are referential, not merely inert components of idioms, "desentential verbs", etc.
By way of comparison, consider the English example *Bush doesn't like anti-Bushites*.
This example is fine, as we expect, because the embedded example of *Bush* is part of
a word and thus cannot bind out of its containing word, which would violate Postal's
(1969) *Anaphoric Island Constraint*, in (41) below. The contrast between matrix and
subordinate VICs would be unexpected, again, if the lower VIC were merely part of
a word. Such constraints show that internal constituents of the embedded ISC predi-
cator are referentially visible to the matrix clause.

    There is additional referentiality evidence for clausal status of ISC predicators, in
the form of a second constraint, (38):

(38) **Obligatory Clitic Agreement Constraint**: If a third-person matrix object is
     referenced on the matrix VIC then it is also referenced on the embedded VIC
     (relevant portions of the clause are in italics, with cosubscripting in the repeated
     examples below):

(39) To' ta   -on_i ma   -on_i wom_i?
     hit 1SG.:RF -3SG.M. 2SG:RP/P -3SG.M. cotton
     'Are you going to wash clothes?' (lit: "I will hit them', you (say) of   clothes?')

(40) a. *To' ta   ma   -on   wom?
        hit 1SG.:RF 2SG:RP/P- 3SG.M. cotton
        'Are you going to wash clothes?' (lit: "I will hit', you (say) of clothes?')

    b. ?To' ta-on_i ma wom_i?
        hit 1SG.:RF 2SG:RP/P cotton
        'Are you going to wash clothes?' (lit: "I will hit', you (say) of clothes?')[19]

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19. I include this example here, where the matrix object is referenced exclusively on the em-
bedded VIC, because it is predicted to be grammatical (this is because matrix object agreement
is generally optional). So it is possible, though rare, to have agreement in the lower clause only.
It is not possible, however, to have agreement in the matrix clause only.

The referentiality constraints in (33) and (38) demonstrate that Wari' ISC predicators have characteristics of sentences, in addition to their word-like properties. If the Wari' examples in (39) and (40) in fact involved coreference between a free word and a part of a word (i.e., analyzing the ISC predicator as merely a word), the ungrammaticality would be unexpected. As we see in (41) below, this is so because the Anaphoric Island Constraint prohibits binding into a word. Before we consider some remaining aspects of ISCs, let us put these referential facts into context.

If ISC predicators were nothing more than "desentential verbs", as proposed in EK and Everett (1998), their referentiality would violate Postal's (1969) "anaphoric island" constraint in (41):

(41)   **Anaphoric Island Constraint** (AIC): "... certain types of linguistic form become what I shall call *anaphoric islands*, where such an entity is a sentence part which cannot contain an anaphoric element whose *antecedent* lies outside the part in question and which cannot contain the antecedent structure for anaphoric elements lying outside."   [emphasis Postal's, DLE]

As an example of what Postal goes on to call "outward anaphora" (Postal 1969: 206), consider the pair in (42) (Postal, 213):

(42)   a.   Followers of McCarthy$_i$ are now puzzled by his$_i$ intentions.
         b.   *McCarthy$_i$ites are now puzzled by his$_i$ intentions.

Postal observes that "inbound anaphora" is also prohibited:

(43)   *The grolf wanted to visit Max. (Where 'grolf' means 'one who has written the biography of ___', Postal (1969, 208).

Example (43) is bad because *Max* is prohibited from binding into the word *grolf* thus leaving *grolf* with an open variable. This rules out in general words which must have a component of their meaning determined by binding.[20] The mixed properties of Wari' ISCs force us to conclude that they differ significantly from better-known cases of complex predicators. For example, these are not merely periphrastic forms (e.g., Everett (2005) and Ackerman & Stump (forthcoming)) because (i) there is no intersection of features, nor distributed exponence, as might be expected if these were but another example of "periphrastic morphology" and (ii) there is no paradigm-like semantic "drift" or specialization (see Everett (2005) for just this type of "drift" in Wari' periphrastic pronouns). On the other hand, they do not fit the normal understanding of complex predicators because they are non-compositional in that the meaning of "to think/to say" is not present in any of their parts or any combination of those parts, it "emerges" from the structure as a whole. Moreover, they do not fit the understanding of complex predicators developed in Ackerman & Webelhuth (1998) [AW] because they violate the constraint of "morphological integrity" which prohibits syntactic word formation and which AW claim to be inviolable.

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20.   Wari' anaphora is discussed in EK (180–191). In general reflexive and reciprocal relations are expressed by special forms of the Verbal Inflection Clitics. Otherwise, the type of anaphora described for ISC predicators is the same as for any other embedded clause.

We see then, that Wari' ISC predicators are quite unusual. I now want to propose an analysis of them in terms of Role and Reference Grammar, in which their behavior is easily understood, as it turns out. We return in section 5 to consider the implications of this analysis for other theories.

4. RRG analysis

The principal claim of my RRG analysis of Wari' ISCs is that the Wari' NUC may dominate a clause. So consider the representation of a Wari' sentence like (10) in the structural analysis in (44):

(44)

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21. The VIC *nanam* is not connected upwards in the tree because, again, in RRG purely grammatical morphemes e.g., agreement, tense, voice, etc. are only connected downwards into the operator structure.

This analysis thus implies that Wari' is not, properly speaking, a VOS language, but, rather, is a nucleus-initial language, or, even better, NUA (Nucleus, Undergoer, Actor, to use RRG terminology). This proposal in fact takes us some way towards an account of the Wari' facts. Consider first the fact that VICs must immediately follow either the verb or the ISC predicator, but nothing else. We can express this by (45), referring to NUC instead of Verb:

(45)   **Wari' Inflectional Clitic Placement:** Wari' inflectional clitics follow the NUC.

Because Wari' sentences are (under the RRG analysis) NUC-initial, rather than V-initial, we immediately account for points (22a), (22e), and (22f) above.

For example, (22a) (the embedded sentence occurs in the verb position of the matrix clause) is accounted for because both the verb and the ISC predicator are in the NUC position, not in a "verb position" per se. (22e) (there is no other potential predicator/verb in the matrix clause) follows because a sentence does not need a *verb*, but, rather, a NUC. And (22f) (the inflectional material must follow the embedded sentence) follows automatically from the statement of inflectional clitic placement in (45).[22]

These results, providing a nearly complete analysis of the word-like characteristics of Wari' ISC predicators, free us from the problematic consequences of the claim made by EK (6ff; 39ff) that the embedded sentence predicator of an ISC has undergone a process of "verbalization". By the analysis here, ISCs do not involve syntactic inputs to the morphological component, since the embedded sentential predicator of the ISC is not claimed to be a word, but a NUC.

To sum up, RRG requires a NUC node for all clauses. This node is not re-quired to dominate any particular syntactic category, nor is it restricted exclusively to word-level units. This means that NUC independently allows for, one might even say predicts, exactly the kind of sentential NUC phenomena observed in Wari'. Since the Wari' embedded sentential predicators are not claimed to be words in the RRG analysis, their phrasal properties require no additional comment and are completely expected. These embedded sentential NUCs are in fact clauses, in spite of the node under which they are embedded (i.e., their level of "juncture" in RRG terms). Their apparent word-like properties are just their NUC properties. Intuitively, the idea that the NUC of a set of constructions like the Wari' ISCs, all closely related to direct speech quotatives, as we above, is unremarkable, at least from an RRG perspective. After all, the predication of a quotative, what the sen-tence is about, is the quote itself, i.e., the content of the utterance or thought cited. The advantage of the RRG analysis is that it, in effect, lets us have our cake and eat it too, by accounting for the conjunction of word and phrasal properties in Wari'

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22.   Recall once again that VICs are *not* second-position clitics. They exclusively follow verbs and ISC predicators, i.e., clausal NUC-position.

ISC predicators without needing to claim that these are mixed categories at all, in spite of initial appearances.

Let's conclude this section by offering an account of stress placement, semantics, and compounding/postverbal modification in ISC predicators. Recall that the structures I am proposing for Wari' ISCs is like that in (46):

(46)

```
                          CLAUSE
                            |
                          CORE
         ┌──────────────────┬──────────────┬──────────┐
       NUC                 VIC            NP          NP
        |
     CLAUSE              na –nam      'oro narima'   aramaxicon
   ┌────────┐
Ma' co mao na –in Guajará
```
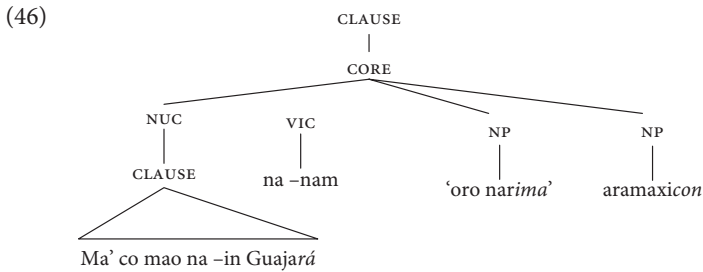
Since RRG independently requires a node with exactly the properties necessary to account for Wari' ISC clausal predicators, this strongly supports the RRG insight that the clause is exocentric and built around a semantic predicator mapped to the syntactic NUC node. There is no need for more complicated structures under the RRG account. With this simple structural proposal, we are prepared to consider how the single word stress, postverbal modification, compounding, postverbal modification, and the semantics of ISC predicators are derived in RRG.

Consider stress placement first. The normal rule of stress in Wari' is given in (25) above, repeated here as (47) (see also Turner (2006)):

(47)   'Within the sentence, the final syllables of major lexical categories are stressed. Primary stress in the sentence normally falls on the final syllable of the verb, with final-syllable stress on other lexical categories interpreted as secondary stress.'

Rule (47) will account for Wari' ISC predicator stress if we substitute NUC for verb, and then prohibit more than one level of stress per Core constituent. To see this, consider how an example like (46) is stressed – the ISC Nucleus will be stressed on the last syllable (where italics = stress) Primary stress placement on NUC comes with no cost in an RRG analysis. This is because in RRG primary sentence stress on NUC is the default case, since Predicate Focus is the default focus (the new information of the clause is given in the predicate) and, therefore, it is common crosslinguistically for NUC to bear primary stress. Since the NUC is a single constituent, regardless of the complexity of the material that it dominates, the stress pattern of Wari' ISCs is exactly the pattern that would be independently expected in RRG.

In RRG, semantic interpretation derives from Linking Rules that connect lexical, syntactic, pragmatic, and other components of RRG clausal structure. Wari' ISC predicators can be interpreted in RRG by adding a linking rule such as (48):

(48)   In an ISC interpret the NUC as the content of a quote or intentional state of the subject.[23]

Now let us turn to the relationship between compounding and multiple embeddings in Wari'. This relationship is a crucial link in the argument that ISC predicators are NUCS and it strongly underscores their similarity to verbs. The multiple embedded predicators discussed above are, as mentioned, unusual in Wari', because multiple occurrences of embedding in a single sentence do not otherwise occur in the language. That is, so-called complement clauses do not themselves allow embedding.[24] Therefore, there is no Wari' equivalent to the English sentence in (49), even when the overt Wari' verb "to say/to tell" is used, as we saw in (7) above:

(49)   John believes that Bill thinks that John thinks that someone else likes him.

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23.   In a more complete RRG analysis of Wari', this rule would be part of a "constructional schema", along the lines of: (thanks to Robert VanValin for suggesting this schema)

Construction: Wari' intentional state constructions

SYNTAX
    Juncture: Nuclear
    Nexus: Subordination
    Construction type: Embedding
    $[_{SENT} [_{CL} [_{CORE} [_{NUC} ([_{SENT}) [_{CL} [_{CORE} [_{NUC}...]...]...]())]...]...]]$
    Unit template(s): Default
    PSA (Privileged Syntactic Argument): None
    Linking: Default

 MORPHOLOGY
    None. No lexical verb in matrix core.

SEMANTICS
    Purposive, cognition, propositional attitude, indirect discourse or direct discourse

PRAGMATICS
    Illocutionary force: Independent in main and embedded clauses in direct discourse; otherwise only in main clause.
    Focus structure: No restrictions

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24.   A reader makes the very reasonable comment that according to my analysis ISC predicator clauses should be found in embedded sentences, just as verbs can be embedded, if my proposed parallelism between verbs and ISC predicators goes through in every instance. This reader is correct that I do in fact predict this. But I have found no examples of it. The problem, I believe, is that embedded clauses outside of ISC predicators are just extremely rare generally in Wari'. There are very, very few examples of non-ISC embedded clauses in Barbara Kern's extensive text collection. So while I do indeed predict that ISC predicators should be found in embedded clauses, as verbs are, I am unable to provide any examples of this at present.

The RRG analysis is able to explain these facts straightforwardly. RRG breaks down what other theories label "embedding" into a range of NEXUS and JUNCTURE types. JUNCTURE refers to the units involved in complex sentence constructions (what kinds of constituents are embedded), while NEXUS refers to the relationships among the units joined in complex constructions (see VVLP, 441ff for further details). Consider in this regard the (simplified) RRG structural analysis of the multiply embedded sentence in (50):

(50) Pa' pa' 'ac   xucucun   na   pain   ca'
      kill kill travel REFL:3PM 3S:RP/P PREP:3N INFL:N:RP/P

      querec xixi'   cwere -xi'   na   caca quem.[25]
      see   1PINCL:IRR body -1PINCL consent 3PM REF

'Then they hit (lit:kill) each other because they want to see the body.' (lit: '(Then) it (is that) they hit (kill) each other because they (say), 'We should see the body consenting.'")

(51)
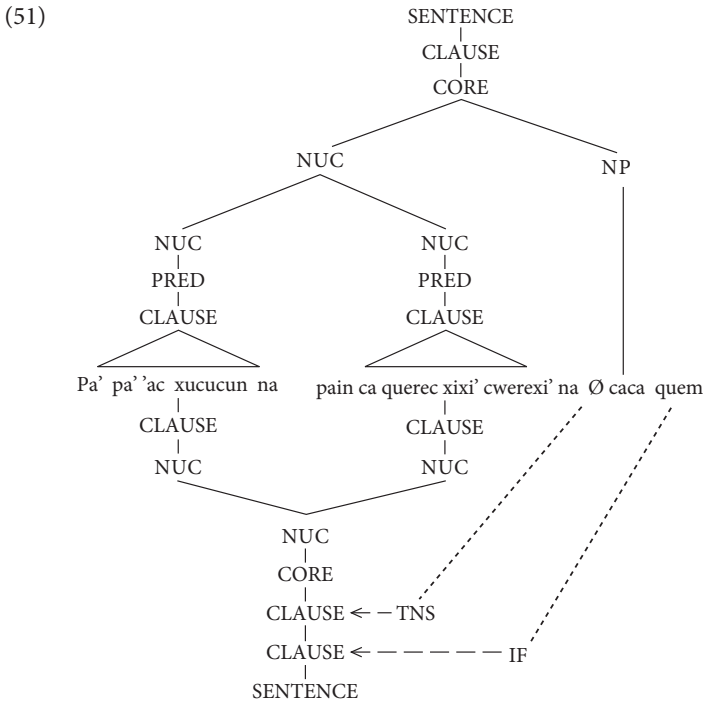
This type of clausal relation is termed Nuclear Cosubordination in RRG (Nuclear because there is a single NUC in the CORE, and Cosubordination, rather than Co-ordination, because the main NUC is composed of multiple NUCs). It is particularly

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25. The VIC **caca** is tenseless here, indeed the entire matrix clause is tenseless, because it is reflexive/reciprocal. See the tables of VICs in footnote 6 above.

interesting to observe that Wari' manifests Nuclear Cosubordination independent of ISC constructions, as shown in the compounding example in (5) above (see EK, 379ff):

The conclusion we are forced to is that although Wari' otherwise lacks more than one level of embedding of clausal complements, it can nevertheless accommodate multiple clauses in ISC predicator position, where these are analyzed by RRG as Nuclear Cosubordination, i.e., a form of compounding.

Before concluding this section, it only remains to say how this analysis handles Tense placement. As stated several times above, tense follows the first verb, modal word, or question word in the clause. This can now be understood by simply constraining tense to follow the first clause-level constituent, i.e., a modal word or NUC (EK, 43ff).

5. Alternative analyses

5.1 Covert verb of saying

One possible counteranalysis to the RRG analysis above would be to explore the hypothesis that Wari' ISCs *do* have a verb "to say", but that it is not "spelled out" in the phonology.[26] Then what I have been calling the ISC predicators are really nothing more than embedded clauses and there are no particular consequences for the theory of syntax other than that in some languages some epistemic verbs may go unpronounced. This simple alternative fails immediately, however. There are at least three important reasons to reject it, all of which we have seen above. First, complement clauses do not otherwise occur in sentence-initial position. Rather, they occur in the position of the argument they represent (Subject, Object, etc.). Second, when complement clauses occur they trigger agreement on the VIC.

But the most serious (and obvious) objection to this counterproposal is that it simply does not account for any of the verb-like characteristics of ISC predicators. Therefore, we must reject the "covert verb" analysis.

5.2 Predicator theory and morphological integrity

AW develop a theory of the concept of *predicate* that is able to account for the robust cross-linguistic observation that a single semantic (or *functional* in LFG terms) predicator may be realized as more than one word in many languages (e.g., English verb + particle predicators in **look up**, **take away**, etc.). Prima facie this seems similar to the situation presented by Wari'. In essence, AW allow for one-to-many mapping from lexical or semantic structure to syntactic structure (in their LFG-based analysis, this is *f-structure* to *c-structure*), but never in the reverse direction. They do this by teasing

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26.   In fact, as I have presented this research in various fora, this is the most common counterproposal I receive.

apart some closely related, yet distinct, strands of the LIH. Their breakdown is given in (52)–(54):

(52) 'Lexical Adicity: The adicity of a lexical item is lexically fully determined and cannot be altered by items of the syntactic context in which it appears.' AW (15ff)

(53) 'Morphological Integrity: Syntactic mechanisms neither make reference to the daughters of morphological words nor can they create new morphological words in constituent structure.' AW (18)

(54) 'Morphological Expression: Lexical entries are uniformly expressed as single synthetic (syntactically atomic) word forms.' AW (19ff)

Lexical Adicity can be ignored as irrelevant to our present concerns. *Morphological Expression* is argued by AW (19ff) to be violable, so that a single lexical item may occasionally be expressed as multiple, even noncontiguous, words. However, and this is crucial to our current discussion, AW (18ff) make it very clear that *Morphological Integrity* is **in**violable, that is, that syntax will never have access to the internal structure of words, since words and syntax are radically separate domains. The inviolability of Morphological Integrity is the core of their proposal.

The sentential properties of ISCs therefore require AW to analyze them as phrases, not words, since otherwise Morphological Integrity would be violated (as in the internal syntax and referential constraints of ISC predicators given above). But if this is so, then the word-like properties of Wari' ISC predicators listed in (22) above simply have no obvious analysis in AW's framework. The only way in which AW's analysis can account for these properties is if Morphological Integrity (MI) is reinterpreted as a violable constraint. And in light of these facts there seems to be no advantage to insist that it is inviolable, rather than, say, "highly ranked" (as in the Optimality Theoretic sense). Therefore, the AW theory can account for the Wari' facts, but only if its central proposal is weakened.

5.3 X-bar theoretic approach

The Wari' ISC predicators, as analyzed in section 4 at least, seem to present a problem for X' Theory since (i) they are exocentric (all X' categories are endocentric by definition) and (ii) the ISC predicators don't seem to fit any of the available X' levels (i.e., X^0, X', or X^{max}). We could not simply treat them as X'-level categories (as one reader of this paper suggested), i.e., intermediate between words (X^0) and phrases (X^{max}) because this would not account for the mixed properties that they manifest. And it would violate the requirement of X' Theory that the head of the Sentence must be a 0-level category in the X-bar system, which would in turn undermine the X-bar concept that all phrases are endocentric.

Nevertheless, there may be a way to salvage an X'-theoretic account of the Wari' facts. Carnie (1995, 2000) discusses superficially similar facts in Irish, arguing that the X^0 vs. X^{max} distinction, i.e., the very distinction between words and phrases, is epiphenomenal and has no primitive status in the Minimalist Program. Carnie's work is based on a study of Irish copular clauses and it is directly relevant to our discussion here. In my discussion of his proposals, I will refer exclusively to Carnie (2000), since that is the most current and concise version.

Carnie's thesis is that X-bar theory is redundant in the best case and wrong in the worst. As he puts it (p. 60), "... any given p-marker may bear properties of both traditional "phrases" and "heads" ... What limits the behavior of p-markers are other properties of the human language computational system ..., not a structural definition or stipulation of the p-marker's status as a phrase or a head." The inspiration for Carnie's proposal comes from Chomsky's (1995) claim that clitics behave both like phrases, X^{max}s) and heads, X^0s.

Carnie's evidence comes from Modern Irish constructions like those in (55)–(56) below (Carnie's (17a–c)):

(55) Is   baincéir (é)   an panda.[27]
      COMP banker (AGR) the panda
      'The panda is a banker.'

(56) Is   dochtúir capall   (é)   Cathal.
      COMP doctor   horses-GEN (AGR) Cathal.
      'Cathal is a doctor of horses'.

Carnie's analysis of these sentences is represented in (57), his (21) (p. 69):

(57)
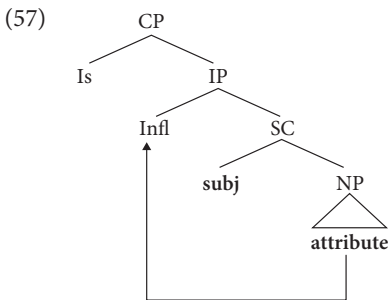
Carnie argues that the attribute has moved to what can otherwise only be considered an X^0, or head, position. He concludes that (p. 94) "... whether a p-marker is a "phrase" or a "word" is externally determined by the other principles of the grammar and is not primitive." However, Carnie recognizes that the Minimalist Program alone is unable to account for all of the Irish facts and so he draws upon Distributed

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27. As Carnie (p. 67, footnote 19, observes, "The presence of the agreement morpheme is dialect dependent, being found mainly in the central Conamara dialect."

Morphology (DM) in order to explain the otherwise anomalous fact that the Irish copular clauses that concern him are not stressed as single words, in spite of his analysis of them as X^0s. As he states (p. 99), "In particular, I claim ... that morphological items are inserted after the syntax via a principle of Late Insertion. The fact that these X^0s are surfacing with phrasal morphology is simply due to the fact that the vocabulary of Irish morphemes contains no single morpheme or affixal elements equivalent to the Complex X^0." He also observes, p. 96, "The nominal predicate also exhibits P-behaviors: It has phrasal phonology (as shown by stress and lack of compounding morphology). It has "phrasal" word order ..."

This means that, according to DM, word-level morphology and word-level phonology are blocked from applying to the "raised attribute" of (111) as a whole and may apply only to its component parts, since only they are "vocabulary items" in the DM sense. In spite of the apparent success of Carnie's analysis for Irish, however, a similar approach to the Wari' facts does not seem to work. This is so because this analysis (i) has no obvious means of predicting the non-compositionality of the meanings of Wari' ISCs (namely, where the meaning of "to say" comes from) and (ii) it seems unable to predict Wari' fact in which a multiword ISC predicator is stressed like a single word. On the other hand, my RRG analysis accounts easily for the Irish facts discussed by Carnie, by generating them under NUC, obviating the need for movement. Since the stress rule of Irish apparently always targets words, not NUCs, nothing further need be said. I conclude, therefore, that in spite of Carnie's very useful suggestions, the RRG analysis is superior.

Before concluding, I would like to consider a set of facts from English that are similar to both the Wari' and Irish facts discussed above. These are discussed in detail in Lieber (1992). I show that my RRG analysis of Wari' extends straightforwardly to the English examples, just as it did for the Irish facts.

5.4   Lieber (1992)

Lieber (1992) cites examples like those in (58)–(61) as evidence that phrasal syntax and word syntax are essentially the same distributionally. If these are indeed productive examples of English morphosyntax then Lieber's facts, like the Wari' examples, would represent a severe problem for theories of morphosyntax based mainly on X'-theory. This is so because the only way in which the phrases below can occur in the positions in which they occur, according to Lieber, is if the morphological component can accept syntactic phrases as input. Alternatively, taking Carnie's view, they can be accommodated if the X' vs. X^{max} distinction is discarded.

(58)   The *Charles and Di syndrome* is no longer relevant. (NP modifying a noun)

(59)   I don't like this new concept of the *running away with my time advertising*. (participial phrase modifying a noun)

(60)　　The *God is dead philosophers* are mostly dead. (periphrastic adjective + noun modifying a noun)

(61)　　My grandson likes to give me *the who's the boss now, silly old grandpa wink* frequently. (clause modifying a noun)

The standard answer to Lieber's data, especially for theories which defend the view that words cannot be formed by the syntax e.g., inter alia, AW, Bresnan & Mchombo (1995, 192) and Spencer (1998, 414–417), is that that such examples are only possible when they have been lexicalized, that is, when they are idioms. The proposal that phrases in the position of words are always/can be idioms is interesting in the present context. Could the Wari' examples we have been discussing also be idioms? The answer is quick for Wari': given the properties they display, they clearly are not idioms. But perhaps the English examples are? I think not. The English examples also seem completely productive to me. If one were to insist that lexicalization is the key to the English facts raised by Lieber (or the Wari' facts), then this would be a lexicalization so immediate and instantaneous (to account for the productivity of the phenomena) as to render the very concept less than useful in this context.

Therefore, Lieber's examples do seem to present a serious challenge to various formal theories of the lexicon-morphosyntax interface, just as the Irish and Wari' facts. These English examples are not quite as unusual (if they are productive and not idioms) as the Wari' facts, however, because they are, like Carnie's Irish examples, not stressed as a single unit, but rather stressed on each individual word (though there is need for more in-depth prosodic studies in each of these cases). The RRG analysis of Wari' developed here applies without modification to Lieber's examples, by allowing phrases to appear under the NUC of the Adjective Phrase in English (except that, for English, NUC stress is not allowed to supersede word stress in English and Irish as it is in Wari'. Therefore, there will be multiple stresses on the Adjective NUC in English).

6.　Conclusion

6.1　General

This paper provides an analysis for a number of intriguing traits of Wari' Intentional State Construction predicators. It accounts for the fact that these predicators have both properties of words and phrases, via the RRG constructs of NUC(leus) and Linking Rules, as well as an analysis of stress based on violable constraints. The paper argues that Wari' ISC predicators require an extension of the class of predicators recognized by Ackerman & Webelhuth (1998), an extension based on reinterpreting their Morphological Integrity Hypothesis as a violable, rather than inviolable constraint, as in AW. This analysis extends to facts of Irish and English without problem, though

previous analyses of the related facts in these languages (Carnie (2000) and Lieber (1992), respectively) do not extend to Wari', suggesting that the RRG analysis proposed here is superior to these previous X'-theoretic analyses.

I have not shown in this paper that verbs and ISC predicators are completely parallel. For example, as a reader observes, I have not show examples of ISC predicates embedded in complement clauses. I suggested earlier, however, that this may either be an accidental gap or a principled gap, both possibilities potentially due to the rarity of embedding outside of ISCs generally in Wari'. Whatever the reason for the gap (accidental, semantic, or syntactic in some way that I have not predicted), there are very strong parallels between verbs and ISC predicators that the present analysis explains very well and that no other proposal I am aware of can account for as well. Interestingly there is one more interesting prediction that the present analysis makes that other analyses do not, discussed in the next section, though this is somewhat internal to the theory of Everett (1996).

6.2   Lack of inflection in Wari' morphology

I want to suggest in concluding this paper that an additional insight into Wari' morphology is provided by the way in which the analysis above relates to the following considerations.

EK observe in various places, but especially in their discussion of derivational morphology (355ff) that it is curious that Wari' should have such a rich derivational morphology (at least as they analyse it, all of which is found in what they call zero-derivation), yet almost no inflectional morphology. That is, the inflectional material, e.g., tense, voice, person, number, mood, etc. is all found on clitics, not affixed to roots or stems. This asymmetrical distribution of derivational vs. inflectional phenomena in the language disappears under the present analysis. The language has one derivational process (compounding) and allows inflection only on inalienably possessed nouns and its single preposition (with room for discussion about one or two other potential cases of inflection). The RRG solution to the asymmetry between inflection and derivation in Wari' is to eliminate it. It also explains why inflection is so rare in Wari'. Inflection would be limited to nouns in my analysis of Wari' because, as we saw, inflection in Wari' follows the NUC. However, although either V or NUC is an appropriate semantic host for inflection, only V is an appropriate morphological host. This is because morphological inflection in general attaches only to words, according to the theory of affixation vs. cliticization developed in Everett (1996), wherein affixes are morphological complements and clitics are word adjuncts. Since NUC is not a word, any inflectional material which follows it would be in clitic form, rather than affix form, i.e., according to Everett (1996) it can only be an adjunct to NUC, since NUC is not a morphological category. Wari' turns out, then, to have almost no morphological processes. This symmetry and simplification of our view of Wari' word-formation (cf. also Everett (1998)) is thus an interesting potential argument for the RRG analysis of Wari' ISCs.

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Neurolinguistic and computational aspects of RRG

Unmarked transitivity

A processing constraint on linking

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Recent experimental evidence suggests that a prototypical concept of transitive events ("unmarked transitivity"), which has proven a useful descriptive notion in language typological research, also plays a crucial role during real time language comprehension. In this chapter, we review neurocognitive evidence for unmarked transitivity from both a neuroanatomical (spatial) and neurophysiological (temporal) perspective. We further show how unmarked transitivity, which we characterise as the default realisation of a more general requirement for argument distinctness, can be integrated into a comprehensive model of cross-linguistic language comprehension. Finally, we discuss possible consequences of the comprehension findings for theoretical characterisations of language architecture, with a particular focus on Role and Reference Grammar.

1. Introduction

The ability to recognise, understand and express transitive events (i.e., events based on a relation between two participants) is one of the most fundamental characteristics of human cognition. Language is no exception in this regard, as it provides various means of expressing this underlying cognitive concept. From the perspective of language typological research, one very influential approach to the modelling of transitivity has been to attempt to define a *prototypical* transitive construction, thereby allowing for a precise characterisation of deviations from this prototype. One very well known definition in this regard is that of "unmarked transitivity":

> In the transitive construction, there is an information flow that involves two entities, the A [Agent] and the P [Patient] … the most natural kind of transitive construction in one where the A is high in animacy and definiteness, and the P is lower in animacy and definiteness; and any deviation from this pattern leads to a more marked construction. (Comrie 1989: 128)

This principle, which was formulated with reference to DeLancey (1981), explains a number of cross-linguistic phenomena in a unified way, e.g., differential object marking (1) or word order freezing (2).

(1)   Differential object marking in Hindi (Mohanan 1994: 80)

  a.   *ilaa-ne haar   ut^haayaa*
       Ila-ERG necklace lift-PERF
       'Ila lifted a/the necklace'

  b.   *ilaa-ne haar-ko   ut^haayaa*
       Ila-ERG necklace-ACC lift-PERF
       'Ila lifted the/*a necklace'

(2)   Word order freezing in Fore (Scott 1978: 115–116), cited from Bisang (2006a)

  a.   *yaga: wá   a-egú-i-e.*
       pig   man 3SP-hit -3SA-INDIC
       'The man kills the pig.' [not: 'The pig kills the man.']

  b.   *mási wá   á-ga-i-e.*
       boy   man 3SP-see-3SA-INDIC
       'The boy sees the man.' [not: 'The man sees the boy.']

Example (1) illustrates the use of case marking to index a divergence from unmarked transitivity: when an object is definite (or animate), it is marked with *-ko*. In example (2), by contrast, word order becomes fixed in the absence of unmarked transitivity. In (2a), both relative orderings of subject and object are permitted as the animacy hierarchy unambiguously determines interpretation. When both arguments are at the same level in the hierarchy (as in 2b), only a subject-before-object order is possible. (Both restrictions can be overcome by marking the actor with ergative case).

In essence, the formulation of unmarked transitivity was based on findings from language production (i.e., observations regarding which utterances occur in a particular language and which do not). If, however, we follow DeLancey in accepting this phenomenon as stemming from more general properties of "human cognitive and perceptual structure" (DeLancey 1981: 654), it should be expected to manifest itself at all levels of language-based communication. In this chapter, we explore this hypothesis with respect to real time language comprehension. Specifically, we will provide neurocognitive evidence for the application of unmarked transitivity in comprehension from both a spatial (neuroanatomical) and a temporal (neurophysiological) perspective. We will further show how a processing principle of this kind can be incorporated into a cross-linguistic model of language comprehension, and will argue that it can be traced back to a more general requirement that arguments should be distinct from one another. Finally, we will discuss how the processing findings on unmarked transitivity may serve to constrain theories of grammar, with a particular focus on Role and Reference Grammar (RRG).

2.   Relevant properties of language comprehension

Before turning to possible effects of unmarked transitivity in language comprehension, we will begin by discussing some basic properties of the comprehension architecture in order to provide the relevant background information for the more specific discussion to follow. In the first part of this section, we will sketch out some general issues that should be kept in mind when considering comprehension data. Subsequently, we will move onto more specific principles related to the phenomenon in question. These will be illustrated on the basis of a cross-linguistic neurocognitive model on the processing of core constituents (arguments and verbs).

2.1   General issues in language comprehension

Language comprehension can be characterised as the process of mapping a linguistic form (speech, text or gestures) onto its corresponding meaning in real time. One of the most fundamental – and also most fascinating – properties of this process is that it takes place *incrementally*, i.e., such that each new incoming word is integrated into the current representation and interpreted as fully as possible as soon as it is encountered. Crucially, incremental interpretation takes place even in the face of incomplete information. Consider the sentence fragment in example (3), from beim Graben et al. (2000).

(3)   *Welche Studentin*   *besuchten* …
       [which student]_{NOM/ACC.SG}   visited_{PL} …

The initial wh-phrase in (3) is ambiguous between nominative and accusative case marking and therefore also ambiguous with respect to grammatical function (or possible PSA status in RRG terms) and semantic macrorole (Actor or Undergoer). In spite of these numerous potential options, however, the processing system adopts an analysis in which the wh-phrase is taken to be the argument that agrees with the finite verb (i.e., the subject or PSA). This processing choice is evidenced by the increased processing costs that can be observed at the position of the adjacent plural verb *besuchten* in (3) in comparison to a singular verb in the same position, i.e., when the "subject-first preference" is disconfirmed. This tendency to analyse an initial ambiguous argument as the subject of the sentence is a robust processing strategy that has been observed in a number of (European) languages (e.g., Italian: de Vincenzi 1991; Dutch: Frazier & Flores d'Arcais 1989; and German: Schriefers et al. 1995).

All available evidence suggests that *incremental interpretation* is a very basic property of the human language comprehension architecture (e.g., Crocker 1994; Stabler 1994) in the sense that it can be observed at all levels of comprehension and even under circumstances of massive ambiguity. Thus, it appears to hold even in consistently head-final languages such as Japanese, in which – in addition to ambiguities regarding case, grammatical function and macrorole as described above – it may not

even be clear to which of several potential clauses an argument belongs. Evidence that the processing system nonetheless does *not* delay interpretation until disambiguating information is encountered was provided by Kamide & Mitchell (1999) using sentences such as (4).

(4)   *Kyooju-ga   gakusee-ni   toshokansisho-ga kasita mezurasii*
      professor-NOM student-DAT   librarian-NOM   lent   unusual

   komonjo-o   miseta.
   ancient.manuscript-ACC   showed

   'The professor showed [the student] the unusual ancient manuscript which the librarian had lent [the student].'

In (4), the dative NP *gakusee-ni* could either be an argument of the main clause (in which case the professor showed the manuscript to the student) or of the relative clause (in which case the librarian lent the manuscript to the student). By comparing globally ambiguous sentences like (4) with sentences disambiguating towards one of the two possible readings (by way of including either main clause or relative clause verbs which did not take a dative argument), Kamide & Mitchell (1999) were able to show that the matrix argument reading is, in fact, preferred. This observation provides strong converging support for the assumption of incremental interpretation.

As is apparent from the discussion of examples (3) and (4), the endeavour to maximise interpretation at each point within a sentence can only be upheld if the processing system is able to select an interpretation from several available candidates.[1] While it is thus generally uncontroversial that the system engages in *ambiguity resolution* during online comprehension, the precise mechanisms leading to a preference for one reading over the other for a particular phenomenon are often subject to much debate. For example, the subject-preference has been attributed to a preference for minimal filler-gap distances (Frazier 1987), for minimal dependencies (in the sense of an initial object triggering the expectation for a subject but not vice versa; Gibson 1998) or simply to a higher frequency of occurrence (Vosse & Kempen 2000) to name just a few of the available explanations.

Finally, given the need for ambiguity resolution during online comprehension, it follows that the processing system may sometimes commit to an analysis that turns out to be incorrect at some later point in the sentence. For example, an ambiguous initial argument may turn out to be an object rather than the subject (as in example 3).

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1.   Note that this does not necessarily imply that the processing system pursues only a single reading to the exclusion of all others ("serial processing"). Preferences of this type may also come about in an architecture in which several readings are maintained in parallel, but with different weightings ("ranked parallel processing"). For an introduction to these more fine-grained architectural issues, see Mitchell (1994).

In this case, the system must initiate a *reanalysis* in order to attempt to come up with the correct reading as quickly and efficiently as possible. Depending on the type of information needing to be revised, reanalyses range from imperceptible to massively disruptive in real time communication (see, for example, Sturt & Crocker 1996).

2.2 Cross-linguistic issues in core argument processing: The extended Argument Dependency Model

Having described some very basic properties of language comprehension at the sentence level, let us now turn to more specific aspects of the processing architecture that might be related to unmarked transitivity. To this end, we will introduce a cross-linguistic model of sentence comprehension that is particularly concerned with the processing of core constituents (arguments and verbs), the extended Argument Dependency Model (eADM; Bornkessel & Schlesewsky 2006). Because of this focus, the eADM appears to provide an optimal point of departure for an empirical examination of unmarked transitivity.

The eADM postulates that the comprehension of sentence constituents is subdivided into three main stages (for a similar assumption, see Friederici 2002). Within the first stage of processing, the current input element is integrated into a phrase structure template on the basis of its word category. As templates only encode category information, no relations between sentence constituents (in the sense of agreement or semantic role assignments) are established at this time. Rather, relational processing is the main focus of the second processing stage. Here, the processing system assigns both formal (e.g., agreement) and interpretive relations (e.g., assignment of the generalised semantic roles Actor and Undergoer; linking of arguments onto the logical structure of the verb). Notably, this stage of relational processing only draws upon a restricted set of cross-linguistically motivated information types (e.g., morphological case, animacy). Finally, in stage 3, the representations created in phase 2 are integrated with all other available sources of information (e.g., discourse context, world knowledge), the well-formedness of the utterance is assessed and revision/repair processes are initiated if required. For a more detailed discussion of the complete model architecture, see Bornkessel & Schlesewsky (2006).

For present purposes, the second stage of comprehension within the eADM is of particular interest because this is the stage that is primarily responsible for argument and verb interpretation. Furthermore, as the notion of unmarked transitivity is closely tied to the properties of the arguments in a transitive relation, we will focus specifically upon the mechanisms of incremental argument interpretation. Within the eADM, argument interpretation is driven by two main factors: a general "least effort" principle termed Minimality and the application of a set of interpretively relevant "prominence hierarchies". The Minimality principle, which is thought to apply at all levels of the processing architecture, is given in (5).

(5)   *Minimality* (Bornkessel & Schlesewsky 2006: 790)

> In the absence of explicit information to the contrary, the human language comprehension system assigns minimal structures. This entails that only required dependencies and relations are created.

With regard to argument interpretation, Minimality leads to a preference for minimal relations, i.e., for semantic intransitivity (for discussion, see Wolff et al. in press). Thus, when an argument is encountered and there is no evidence to the contrary (such as accusative case marking), the processing system will assume that it is the sole argument of an intransitive relation. Empirical evidence for this assumption stems, for example, from the observation of increased processing costs at the position of an accusative argument following an initial nominative in German and Japanese (Bornkessel et al. 2004; Wolff et al. in press). This seemingly counterintuitive finding of higher processing demands in a canonically ordered sentence follows straightforwardly from the assumption of an initial preference for intransitivity, which needs to be revised when a second argument is encountered. For a detailed discussion of Minimality during incremental sentence comprehension, see Bornkessel-Schlesewsky & Schlesewsky (in press).

Of course, there are many situations in which Minimality cannot be upheld and a transitive reading must be assumed. This is the case, for example, when the first argument that is encountered by the processing system is marked with accusative case, thus unambiguously signalling a transitive relation (except, perhaps, in languages with split-intransitivity). Under these circumstances, the primary aim of the processing system is to establish a hierarchical relation between the arguments (argument A > argument B). A hierarchical representation of this type serves to guarantee for incremental interpretation even in verb-final structures because it essentially amounts to a minimal interpretation of the relation between the arguments. Thus, the default interpretation of A > B corresponds to something like "A acts on B", i.e., to an interpretation in which A is a prototypical Actor and B is a prototypical Undergoer. However, alternative interpretations of the same hierarchy (e.g., "A experiences B" or "A possesses B") are also possible (see Primus 1999). Furthermore, we follow Primus (1999) in assuming that the hierarchical relation between the generalised roles results from semantic dependencies, i.e., an Undergoer is dependent on an Actor but not vice versa because an affected event participant implies the presence of a causing/controlling participant (see Schlesewsky & Bornkessel 2004). Crucially, the establishment of argument hierarchies of this type is completely independent of phrase structure information (i.e., of the representations assigned during stage 1 of processing), but is based on a set of hierarchically ordered, relational information types referred to as *prominence hierarchies*. These hierarchies are defined on the basis of language-comparative research in the sense that they have been implicated as important sources of cross-linguistic similarities and differences with respect to a wide range of morphosyntactic phenomena (e.g., Comrie 1989; Croft 2003). There are essentially two types of prominence hierarchies, namely those encoding interpretively relevant information (6) and those encoding formal information (7).

(6)   Interpretive prominence hierarchies
    a.   +animate > −animate
    b.   +specific/+definite > −specific/−definite
    c.   +nominative > −nominative (in nominative-accusative languages)
    d.   arg1 > arg2
        [i.e., the first argument is more prominent than the second argument]

(7)   Formal prominence hierarchy
    a.   +agrt > −agrt
    [i.e., the argument that agrees with the verb is more prominent than arguments
    that don't agree with the verb]

The prominence hierarchies in (6) serve to establish an interpretive dependency between two arguments in which one argument outranks the other. Crucially, the relative importance of the different hierarchies is language-specific, i.e., linear order (6d) is the primary determinant of interpretation in a language like English, whereas case marking (6c) is the primary determinant of interpretation in a language like German, Russian or Hindi. Nonetheless, all of these languages have in common that animacy and definiteness/specificity only serve to modulate the distance of the arguments with respect to one another, but cannot override the hierarchical ranking itself.[2] However, this state of affairs is by no means universal, as the situation in Fore exemplifies (see the examples in 2). Here, the animacy hierarchy is dominant in establishing the dependency relation between arguments, i.e., in the default case, the argument lower on the animacy hierarchy is interpreted as dependent on the argument that is higher on the animacy hierarchy. To force an interpretation against the animacy hierarchy, additional morphological marking is required (namely ergative case marking on the lower-ranking argument); word order, by contrast, does not play a role. Word order does, however, come into the picture in the construal of a relation between two arguments that are equally prominent on the animacy hierarchy. Under these circumstances, the first argument is interpreted as more prominent than the second. Finally, word order can again be overridden by case marking (ergative marking on the higher-ranking argument) even with two equally animate or inanimate arguments. This relatively complex picture aptly illustrates the role of the different prominence hierarchies in determining interpretation. Strikingly, findings from online comprehension suggest that prominence hierarchies are operative during language processing even when they do not determine morphosyntactic behaviour in a given language (e.g., animacy in German or English). A language's overt reliance upon a particular hierarchy or set of

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2.   For example, *The cricket ball hit the boy* is an instance of a marked transitive construction (in the sense of Comrie 1989), i.e., a construction with a suboptimal Actor and a suboptimal Undergoer. Crucially, however, the conflict between the animacy hierarchy and the linear order hierarchy can never be resolved in favour of the animacy hierarchy in this language. Thus, animacy only serves to specify whether the hierarchical relation between the arguments is marked or unmarked, but cannot determine the hierarchy in and of itself.

hierarchies might therefore be viewed as a grammaticalisation of a certain set of processing preferences (see also Hawkins 2004).

From the discussion above, it should be clear that the eADM conceptualises the role of prominence information during argument interpretation as subserving two basic functions. On the one hand, the application of prominence hierarchies serves to establish a hierarchical dependency between two arguments. On the other, it can further specify the precise nature of this hierarchy: if all hierarchies are aligned, the higher-ranking argument is interpreted as an ideal Actor and the lower-ranking argument is interpreted as an ideal Undergoer (in the sense of unmarked transitivity). By contrast, if several hierarchies are in conflict, the hierarchy between the arguments is marked (and the likelihood of an interpretation in terms of the ideal basic predicate CONTROL(x,y) is reduced).

When the processing system subsequently encounters the verb, the prominence-based argument hierarchy is mapped onto the information specified in the verb's lexical entry. Within the eADM, this lexical representation is conceptualised as a decomposed semantic form (like RRG's "logical structure", LS), which encodes both the hierarchy of the arguments with respect to one another and their relative distance from one another on the hierarchy. Notably, the degree of match between the argument hierarchy established on the basis of prominence information and the argument hierarchy called for by the verb determines how costly this "linking" step will be. For example, when prominence-based information signals an ideal transitive relation, but the verb calls for a deviation from this ideal structure (e.g., in an experiencer construction), increased linking costs will arise. Conversely, when the prominence information encoded by the arguments suggests that unmarked transitivity is not upheld, but the verb specifies that the arguments are maximally distinct, linking is also more difficult. Linking is easiest (least costly), when the prominence hierarchy matches the verb-specific information.

In the following section, we will present empirical evidence in favour of this view.

3.   Empirical evidence for prominence dependencies, distinctness and unmarked transitivity during online comprehension

3.1   The spatial perspective

Processing effects related to unmarked transitivity have been observed most directly in functional neuroimaging studies, which serve to identify brain regions involved in different aspects of language comprehension. On the one hand, deviations from an unmarked word order (i.e., from an order in which the more prominent argument linearly precedes the less prominent argument) manifest themselves in increased activation in the pars opercularis of the left inferior frontal gyrus (see Figure 1; Bornkessel et al. 2005; Grewe et al. 2005; Grewe et al. 2006). On the other hand, deviations from maximal distinctness (i.e., from unmarked transitivity) have been shown to correlate with

activation in a very different part of the brain, namely in the posterior portion of the left superior temporal sulcus (pSTS, see Figure 1; Grewe et al. 2007). Thus, sentences such as (8b) engender increased activation in this region in comparison to sentences such as (8a) and this activation increase is fully independent of argument order (i.e., variants of 8a/b with the accusative argument preceding the nominative patterned exactly like their subject-initial counterparts with respect to activation in the pSTS). Note that the "unmarked transitivity" effect observed by Grewe et al. (2007) is not likely a lexical phenomenon, as comparisons of animate vs. inanimate nouns at the word (or picture) level have been shown to lead to activation differences in regions other than the left pSTS (e.g., Caramazza & Mahon 2005).

(8) a. *Wahrscheinlich hat der Mann   den Garten   gepflegt.*
         probably   has [the man]$_{NOM}$ [the garden]$_{ACC}$ cared-for
         'The man probably cared for the garden.'

     b. *Wahrscheinlich hat der Mann   den Direktor   gepflegt.*
         probably   has [the man]NOM [the director]ACC cared-for
         'The man probably cared for the director.'
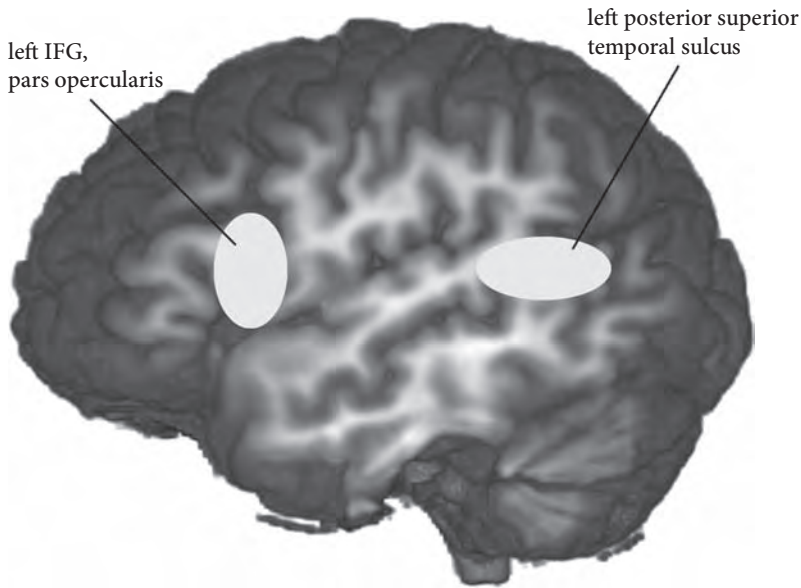
Figure 1. This figure shows the left hemisphere of the human brain and provides a schematic depiction of the brain regions involved in the processing of argument linearisation (pars opercularis of the left inferior frontal gyrus, IFG) and unmarked transitivity (left posterior superior temporal sulcus, pSTS), respectively. The pars opercularis of the left IFG shows increased activation when the less prominent of two arguments linearly precedes the more prominent argument. By contrast, increased activation is observed in the left pSTS when a sentence diverges from unmarked transitivity, irrespectively of the linear order of the arguments.

Several additional findings attest to the robustness of the association between the left pSTS and deviations from unmarked transitivity. Firstly, Grewe et al. (2006) reported a similar effect for passivised ditransitive constructions such as (9).

(9)   a.   *Dann wurde dem Arzt   der Mantel   gestohlen.*
           then   was   [the doctor]$_{DAT}$ [the coat]$_{NOM}$ stolen
           'Then the coat was stolen from the doctor.'
           (~ 'Then the doctor had his coat stolen.')

      b.   *Dann wurde dem Arzt   der Polizist   vorgestellt.*
           then   was   [the doctor]$_{DAT}$ [the policeman]$_{NOM}$ introduced
           'Then the policeman was introduced to the doctor.'

In the sentences in (9), the dative argument *dem Arzt* ("the doctor") outranks the nominative (Undergoer) arguments *der Mantel* ("the coat")/*der Polizist* ("the policeman") on the thematic hierarchy. Thus, in terms of the eADM, the nominative argument is dependent on the dative argument in these constructions. The comparison between (9b) and (9a) again yielded increased activation in the left pSTS for (9b) that was independent of word order. This finding suggests that the unmarked transitivity effect observed in this region is independent of particular case configurations. Thus, it shows (a) that the effect is not the result of associations between individual cases and corresponding animacy statuses, e.g., nominative arguments need not always be the highest-ranking and most highly animate argument in a transitive relation, and (b) that it is not restricted to sentences with a prototypical actor-undergoer relation, as it can also be observed in relations involving a dative-marked argument.

In a further neuroimaging study, Chen et al. (2006) observed increased left posterior superior temporal activation for English sentences containing object relative clauses when the head noun was animate and the subject within the relative clause was inanimate (i.e., for 10b vs. 10a).[3]

(10)   a.   The wood that the man chopped heated the cabin.
       b.   The golfer that the lightening struck survived the incident.

This finding indicates that deviations from unmarked transitivity in the neuroanatomical sense are not only observable for animacy manipulations of the lower-ranking argument in a transitive relation. Rather, as should be expected, the phenomenon extends to sentences in which there is an inverted mapping between the animacy

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3.   Note that Chen et al. (2006) also observed increased activation for (10b) vs. (10a) in several other cortical regions. However, in contrast to German, English is not suited to disentangling a number of potential influences in the processing of the constructions under consideration (e.g., linear order vs. unmarked transitivity at the purely relational level). However, on the basis of experiments from German that manipulated these dimensions separately (Bornkessel et al. 2005; Grewe et al. 2005, 2006, 2007), we conclude that the posterior superior temporal activation reported by Chen et al. likely resulted from a deviation from unmarked transitivity.

hierarchy and the argument dependencies in a transitive relation (i.e., when the higher-ranking argument is inanimate and the lower-ranking argument is animate).

Finally, there is also some evidence to suggest that unmarked transitivity effects can be observed in the pSTS via manipulations of definiteness/specificity. Thus, Bornkessel-Schlesewsky et al. (submitted) observed increased activation in the ascending ramus of the left STS for German sentences with an indefinite/non-specific subject (e.g., *Autorinnen*, "authors") and a definite/specific object (a proper noun) in comparison to sentences with a definite/specific subject and an indefinite/non-specific object. As in the Grewe et al. (2006, 2007) studies, this activation was independent of argument order.

In summary, the pSTS appears to be sensitive to a generalised notion of "unmarked transitivity" in which the higher-ranking argument of the transitive relation should outrank the lower-ranking argument on all applicable prominence hierarchies. Deviations from unmarked transitivity result in increased activation in this region independently of linear argument order and of macrorole status of the arguments (i.e., of macrorole transitivity).

3.2   The temporal perspective

While the neuroanatomical findings discussed in the previous section attest to the application of a notion like unmarked transitivity during language comprehension, they cannot distinguish between an account in which unmarked transitivity is applied during a final evaluative stage of processing and one in which this principle is actively used to guide real time sentence comprehension. This indistinguishability results from the low temporal resolution of functional imaging methods, which rely upon a delayed haemodynamic response (i.e., increased blood flow to an active region in the brain). In this section, we will therefore present neurophysiological findings which attest to the relevance of prominence information, distinctness and unmarked transitivity in incremental interpretation. All of the experiments to be discussed in the following used the event-related brain potentials (ERP) methodology, which measures changes in the electrical activity of the brain and is therefore suited to revealing the exact timecourse of information processing. For a brief introduction to the ERP method, see Appendix 1.

One of the earliest results on the interplay between case and animacy information during incremental interpretation stems from the examination of German sentences such as (11) (Frisch & Schlesewsky 2001; Roehm et al. 2004).

(11)   *Peter fragt sich, …*
        Peter asks himself …

    a.   *… welchen Arzt*   *der Jäger*   *gelobt*   *hat.*
            … [which doctor]$_{ACC}$ [the hunter]$_{NOM}$ praised   has
            '… which doctor the hunter praised.'

b.   *… welchen Arzt*   *der Zweig*   *gestreift*   *hat.*
      … [which doctor]$_{ACC}$ [the twig]$_{NOM}$ brushed   has
      '… which doctor the twig brushed.'

While both of the embedded wh-questions in (11) begin with an animate accusative, they differ in that the following nominative argument is animate in (11a) and inanimate in (11b). At the position of the nominative argument (critical sentence positions are underlined here and in the following), sentences such as (11b) gave rise to increased processing cost in comparison to (11a). This effect was observable in the form of a so-called "N400", a central negativity between approximately 200 and 500 ms post onset of the NP (Roehm et al. 2004) (see Figure 2A). Crucially, this result cannot simply be attributed to problems associated with the processing of an inanimate nominative, as no comparable effect was observed for inanimate vs. animate clause-initial nominative arguments (Ott 2004). Rather, the most plausible explanation for the animacy effect in sentences like (11) appears to be the following. When the first argument is encountered, it is interpreted as an Undergoer on the basis of its accusative case marking. Given the semantic dependency between Undergoers and Actors (Primus 1999), the comprehension system uses the information that it has processed an Undergoer to predict an ideal Actor argument. In accordance with Unmarked Transitivity, this argument should therefore outrank the Undergoer on the animacy hierarchy. When this is not the case, a prominence mismatch arises, which is reflected in the N400.

The German findings thus suggest that the application of Unmarked Transitivity during online comprehension (a) involves a predictive component, and (b) is inherently
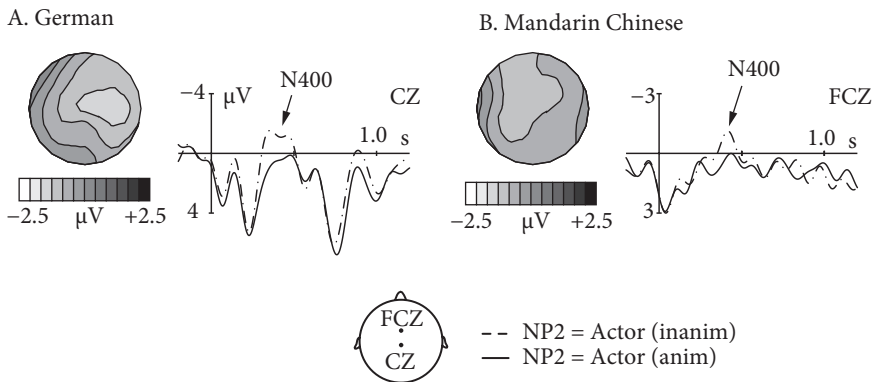
Figure 2. Grand average event-related brain potentials at the position of inanimate (dash-dotted line) vs. animate (solid line) Actor arguments following an Undergoer argument in German (panel A) and Mandarin Chinese (panel B). The data are taken from Roehm et al. (2004) and Philipp et al. (2008), respectively. In each case, the onset of the critical argument is signalled by the vertical bar and negativity is plotted upwards. The topographical maps depict the scalp distribution of the N400 effect at its maximum (inanimate NP – animate NP). Note that the study on German employed visual stimulus presentation, while the stimuli in the experiment on Mandarin Chinese were presented auditorily.

relational in nature (i.e., increased processing costs due to prominence mismatches are only observable when more than one argument has already been processed). Converging support for the cross-linguistic applicability of this type of processing mechanism stem from Mandarin Chinese. Thus, Philipp et al. (2008) observed an N400 at the position of an inanimate Actor argument following an initial Undergoer argument in sentences such as (12).

(12) a. 王子　　被　挑战者　　刺死　　了。
          wáng zǐ bèi tiǎo zhàn zhě cì sǐ   le
          Prince   bèi contender stab   PERF
          'The prince was stabbed by the contender.'

      b. 王子　　被　绳子　　　勒死　　了。
          wáng zǐ bèi shéng zi lēi sǐ   le
          Prince   bèi cord   strangle PERF
          'The prince was strangled by the cord.'

The examples in (12) illustrate the so-called *bèi*-construction in Mandarin Chinese, which is often described as a passive-like construction.[4] Crucially for present purposes, the coverb *bèi* unambiguously identifies the first argument as an Undergoer, thus leading to an analogous comprehension situation to that in the German examples in (11). Just as in German, the processing of an unambiguous Actor argument that is lower on the animacy hierarchy than the preceding Undergoer argument gave rise to an N400 effect in Mandarin Chinese (Philipp et al. 2008) (see Figure 2B). Note that, using further experimental conditions, Phillip et al. also contrasted animate and inanimate initial NPs and found no difference in terms of ERPs. This observation therefore again shows that the effect in question does not result from simple animacy differences at the single argument level but that it must rather be analysed as a correlate of relational argument processing.

Finally, findings from Turkish reveal the influence of argument distinctness on linking processes at the position of the verb in verb-final structures. Consider the following sentence types, which Demiral et al. (submitted) examined in an ERP study.

(13) a. *Dün   kız adamı   destekledi.*
          Yesterday girl man-ACC support-PST-3.SG
          'Yesterday the girl supported the man.'

      b. *Dün   firma   adamı   destekledi.*
          Yesterday company man-ACC support-PST-3.SG
          'Yesterday the company supported the man.'

---

4.   Note, however that the *bèi*-construction also differs from "European-style" passive constructions in that it is traditionally associated with an adversative reading, i.e., a reading in which the first NP (the Undergoer) is negatively affected by the event described (e.g., Bisang 2006b; Chappell 1986).

    c.   *Dün   kız adamı   cezbetti.*
          Yesterday girl man-ACC please-PST-3.SG
          'Yesterday the girl pleased the man.'

    d.   *Dün   firma adamı   cezbetti.*
          Yesterday company man-ACC please-PST-3.SG
          'Yesterday the company pleased the man.'

The first crucial manipulation in the sentences in (13) is one of verb type, i.e., the clause-final verb is either an active verb (e.g., "to support", 13a/b) or an object-experiencer verb (e.g., "to please", 13c/d). In comparison to the active verbs, the experiencer verbs lead to a reduction in (verb-specific) argument distinctness. As described in the section on the eADM, this manipulation should affect argument linking in the sense that it should result in increased linking costs when the prominence information computed preverbally does not match the verb-specific prominence hierarchy. In this way, sentences in which preverbal prominence information signals a deviation from unmarked transitivity should render sentences with object-experiencer verbs easier to process, while at the same time leading to higher processing difficulty for active verbs. The comparison between sentence-final active and object-experiencer verbs can therefore be used as a diagnostic tool for the application of different types of information in the (preverbal) computation of prominence hierarchies in Turkish. The experiment reported by Demiral et al. (submitted) manipulated two information types relevant to prominence computation, namely animacy (i.e., the nominative argument was either animate, 13a/c, or inanimate, 13b/d) and word order (i.e., sentences either had a subject-before-object order, as in 13, or an object-before-subject order).

    At the position of the clause-final verb, Demiral et al. (submitted) observed N400 effects for object-initial sentences with active verbs and for subject-initial sentences with object-experiencer verbs (see Figure 3). Crucially, however, both of these effects were only observable in the sentences with two animate arguments, i.e., in sentences with an inanimate nominative and an animate accusative, no N400 differences were observed between the two verb types. This result indicates that unmarked transitivity may be overridden when verb-specific information serves to render the arguments unambiguously distinct even in the absence of an unmarked transitive structure. For all of the verbs used by Demiral et al., animate objects are strongly preferred – since this is clearly a general requirement for object-experiencer verbs, it was also applied as a selection criterion for the active verbs. Thus, for all verbs used in the experiment, sentences with an animate and an inanimate argument allow for an unambiguous linking of arguments to positions in the LS. When this is the case, linking costs don't differ between the verb classes.

    By contrast, when argument distinctness is not upheld by animacy differences, the degree of match between the prominence information processed before the verb and the verb-specific linking requirements determines the degree of processing cost. Thus, object-initial sentences gave rise to increased processing difficulty for active vs. experiencer verbs, whereas subject-initial sentences engendered higher processing costs

A. Subject-before-Object   B. Object-before-Subject

Two animate arguments

−2.5 *μ*V +2.5   −2.5 *μ*V +2.5

N400   FCZ   N400   FCZ

Inanimate NOM and animate ACC

FCZ   FCZ

-- OBJ–EXP Verb
— ACTIVE Verb
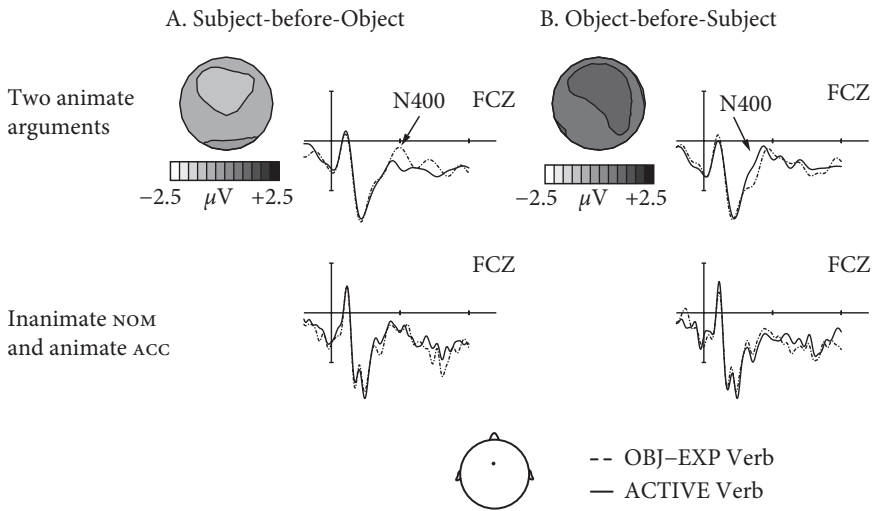
Figure 3. Grand average event-related brain potentials at the position of clause-final object-experiencer (dash-dotted line) vs. active (solid line) verbs in Turkish. The data are taken from Demiral et al. (submitted). The differences between the two verb types are depicted for sentences with a subject-initial word order in the left-hand panel and for sentences with an object-initial word order in the right-hand panel. The top panel contrasts sentences with two animate arguments, whereas the the bottom panel shows that no comparable effect was observed in the sentences with an inanimate nominative and an animate accusative argument. The onset of the critical verb is signalled by the vertical bar and negativity is plotted upwards. The topographical maps depict the scalp distribution of the N400 effect at its maximum (object-experiencer verb – active verb).

for object-experiencer vs. active verbs. This result supports the idea that an object-initial order signals a deviation from maximal argument distinctness (as it increases the prominence of the Undergoer): when this coincides with the verb-specific linking requirements, processing costs are reduced, but when there is a mismatch, processing costs increase. Conversely, subject-initial orders appear to confirm the system's expectation for maximal distinctness, thereby leading to increased processing difficulty for object-experiencer as opposed to active verbs.

In summary, electrophysiological findings from several languages provide converging support for the application of unmarked transitivity during online comprehension. This principle is applied predictively as a default mechanism to guarantee the distinctness of arguments. When unmarked transitivity cannot be upheld (i.e., when different prominence hierarchies are in conflict), a central negativity between approximately 300 and 500 ms (N400) is observed. Finally, N400 effects are also engendered at the position of the (clause-final) verb when the prominence information processed preverbally does not directly map onto the linking requirements of the verb. However, increased linking demands of this type can be overridden when verb-specific

information (e.g., regarding the animacy status of its arguments) unambiguously leads to distinctness of the arguments. Hence, unmarked transitivity appears to be the default realisation of a more general processing principle which states that arguments should be distinct from one another.

4.   Consequences for language architecture

In addition to the many cross-linguistic observations of transitivity phenomena, findings from the domain of language processing provide robust evidence for the application of unmarked transitivity as a default manifestation of a more general "distinctness" requirement for arguments. Thus, if one takes seriously the notion that theories of grammar should be "psychologically adequate" (Dik 1991), the potential consequences of this observation for linguistic theory appear well worth exploring. In accordance with the aims and scope of this volume, we will discuss this issue with a particular focus on RRG.[5]

First and foremost, cross-linguistic findings on language comprehension provide strong evidence that all information types related to the interpretation of an argument should be represented independently of phrase structure information. Similar observations hold for the assignment of morphological case marking and the establishment of formal relations like agreement. For a detailed motivation of this claim on the basis of findings from German, see Schlesewsky & Bornkessel (2004) and Bornkessel and Schlesewsky (2006). If comprehension data are viewed as potentially informative for theoretical models of language architecture, an important consequence of these observations is therefore that all relational argument properties (semantic/thematic roles, case, agreement) should not be determined with reference to (a) particular position(s) in the phrase structure, but rather assigned in a structure-independent manner. Consequently phrase structure representations should essentially only encode word/phrasal categories. This requirement is clearly fulfilled by RRG: the constituent projection encodes only category information, while all of the other information types under discussion are dealt with as part of the linking algorithm.

Keeping this fundamental separation between category information and relational information in mind, let us now turn to the transitivity phenomena discussed in the preceding sections. What might be the status of unmarked transitivity/prominence hierarchies within the grammar? It appears relatively clear that these phenomena would need to be addressed as part of the linking component. As the theory already explicitly allows for language-specific constraints on linking via properties such as animacy, a more general implementation of prominence phenomena within the linking stage

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5.   For a theoretical treatment of transitivity phenomena within the framework of Optimality Theory, see Aissen (2003).

would seem to be a relatively natural extension. Thus, (a language-specific ranking of) prominence hierarchies could be used to constrain linking in the default case, with more specific (i.e., verb-specific) information overriding when available.

In principle, the overall architecture of RRG therefore appears to allow for a relatively natural integration of prominence-based phenomena such as unmarked transitivity. However, the potential implementation of a prominence component of this kind also raises a number of questions. Firstly, it is not clear how prominence information should be represented. Whereas, in its syntax-to-semantics linking algorithm RRG allows for linking to be guided by predicate-independent representations, there is currently no integration of universal hierarchies that may apply to a greater or lesser degree in a particular language. Thus, the question arises of how this information might relate to the language-specific linking requirements based on properties such as animacy that are already included within the theory.

Secondly, if prominence hierarchies are to play an important role in the linking process, what is their relation to semantic macroroles, which are core components of RRG's linking algorithm? In particular, it is presently not clear whether prominence information generally serves to influence Actor/Undergoer/Non-Macrorole assignments in the sense of RRG. While this must certainly be the case for some information types (e.g., morphological case), an extension to other properties (e.g., animacy) appears somewhat more problematic, especially in languages in which they do not give rise to "hard" grammatical constraints. Nonetheless, the potential link between macroroles and prominence is at least intuitively appealing: for example, just as dative is regarded as the default non-macrorole case in RRG, it is also the default case used to mark divergence from maximal distinctness (i.e., from unmarked transitivity). The question of whether prominence information might be incorporated into RRG as a potential influence on macrorole assignments thus essentially amounts to the question of whether macroroles could feasibly be afforded a predicate-independent component within the theory. A detailed discussion of this issue is beyond the scope of this chapter.

A somewhat more conservative perspective on the status of prominence hierarchies within RRG might characterise them as processing constraints on linking. Thus, these information types could be viewed as providing the system with default linking options – or, more precisely, with default macrorole assignment options – to be employed under circumstances of incomplete information. Such circumstances arise, for example, when assignments need to be undertaken in absence of the predicate or when the predicate does not provide any strong constraints on the type of arguments that it requires. In these cases, unmarked transitivity – as defined via a convergence of all prominence hierarchies – serves to render the arguments distinct from one another, thereby unambiguously determining macrorole assignments. This endeavour of the system to maximise distinctness of the arguments during processing appears to stem from a more general cognitive requirement to minimise interference among competing representations (see Lewis et al. 2006; McElree 2006). As representations that are more similar to one another are associated with a higher degree of interference,

distinctness (unmarked transitivity) appears to provide an optimal means of reducing cognitive processing load during linking. However, when more specific information – i.e., information deriving from the grammar proper – contradicts the default assignments required by unmarked transitivity, these can be overridden as distinctness is then guaranteed by other means.

Nonetheless, the most parsimonious implementation of such a processing-based view of unmarked transitivity would presumably also require some kind of grammatical representation of the different prominence hierarchies within the universal component of the linking algorithm. Which of these hierarchies determine linking in an individual language would then be specified within the language-specific linking component. In essence, this proposal would simply require a systematisation of the prominence-based linking restrictions that are already assumed as language-specific constraints on macrorole assignments within RRG (Van Valin 2005). Importantly, representing all prominence hierarchies within the universal aspect of the linking component would render them accessible to the processing system. In this way, prominence information could be employed as a linking-default even when it places no grammatical constraints on linking in the language in question.

5. Appendix 1: A brief introduction to event-related brain potentials (ERPs)

Event-related brain potentials (ERPs) are small changes in the spontaneous electrical activity of the brain, which occur in response to sensory or cognitive stimuli and which may be measured non-invasively by means of electrodes applied to the scalp. ERPs provide a very high temporal resolution, which is particularly useful as a means of tracking real time language processing. Furthermore, ERP patterns ("components") can be characterised along a number of different dimensions, thus providing a qualitative measure of the different processes involved in language comprehension. These dimensions are: polarity (negative vs. positive), topography (at which electrode sites an effect is visible), latency (the time at which the effect is visible relative to the onset of a critical stimulus), and amplitude (the "strength" of an effect). While a number of language-related ERP components have been identified (cf., for example, Friederici 2002), we will not introduce these here for the sake of brevity. For a more detailed description of the ERP methodology and how it has been applied to psycholinguistic domains of investigation, the reader is referred to the recent overview presented by Kutas et al. (2006).

The ERP methodology only provides relative measures, i.e., an effect always results from the comparison of a critical condition with a minimally differing control condition. For example, at the position of socks in *He spread the warm bread with socks* in comparison to the position of *butter* in *He spread the warm bread with butter*, a

ONGOING EEG

one sec

AUDITORY EVENT-RELATED POTENTIAL

−6 μV

N400

ELAN

AUDITORY
STIMULUS
(S)

P600

P200

+6 μV   200   400   600   800   1000   ms

STIMULUS   Time
ONSET
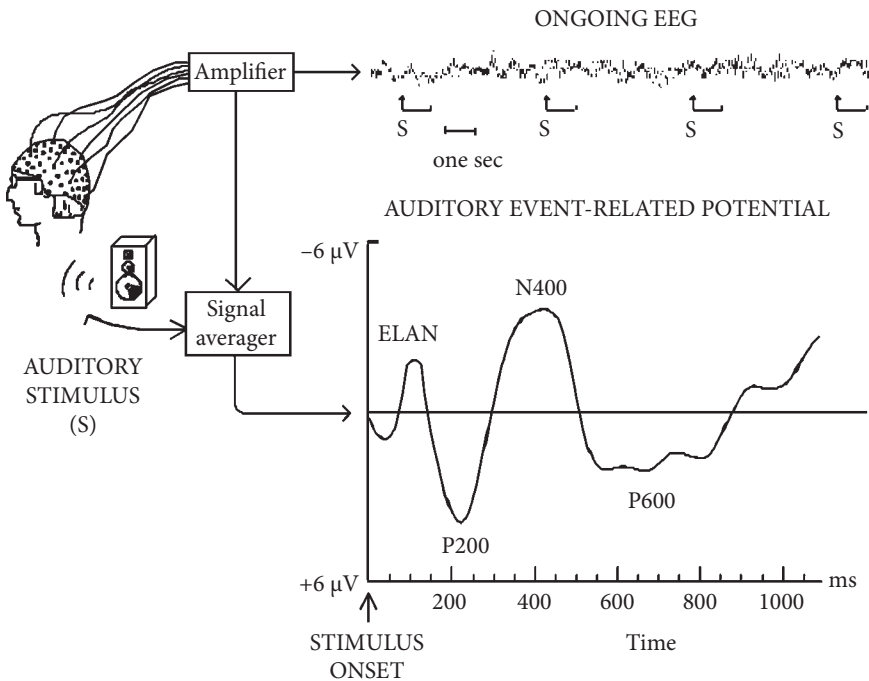
Figure 4. Schematic depiction of the setup of an ERP experiment on language processing (adapted from Rugg & Coles 1995). The ongoing EEG is recorded while participants read or listen to linguistic stimuli. Critical stimulus-related activity is isolated from the background electrical activity of the brain by means of an averaging procedure, which applies to a set of stimuli (typically 30–40) of the same type. The resulting event-related brain potential, which is shown in the bottom right-hand corner of the figure, consists of a series of negative and positive potential changes. Note that, by convention, negativity is plotted upwards. The x-axis depicts time (in miliseconds or seconds) from critical stimulus onset (which occurs at the vertical bar), while the y-axis depicts voltage in microvolts. ERP components are typically named according to their polarity (N for negativity vs. P for positivity) and latency (an N400, for example, is a negativity with a peak latency of approximately 400 ms relative to critical stimulus onset). ERP comparisons are always relative, meaning that negativities or positivities in a critical condition can only be interpreted relative to a control condition and not in absolute terms (i.e., relative to the zero-line).

negativity with a central distribution and a maximum at 400 ms post critical word onset (N400) is observable (Kutas & Hillyard 1980). Thus, in the experiment presented here, we always compare the response to a critical condition with that to a control condition at a particular (critical) position in the sentence. A schematic illustration of the ERP methodology is shown in Figure 4.

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Parsing for Role and Reference Grammar

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Parsing of human languages is a well studied subject, but most algorithms will handle either fixed word order languages or free word order languages. In this paper we describe extensions to a chart parser in order to enable varying degrees of word order flexibility and parsing via templates instead of rules. We have chosen to use templates instead of rules because this enables more information to be captured, which in turn will make it easier to extract the meaning from the sentence. The grammatical paradigm used in this paper is Role and Reference Grammar, but we expect the methods to be useful for other grammatical paradigms.

1.   Introduction

Role and Reference Grammar (RRG) (Van Valin & LaPolla 1997) (Van Valin 2005) is a promising theory for extracting the meaning from sentences from a computational viewpoint for several reasons. Because it posits multiple projections, the various aspects of a sentence can be dealt with separately. For example words that modify other words are removed from the constituent projection and placed in an operator projection, which shows how these words modify the meanings of the words in the constituent projection. As a result, only the main constituents of a sentence have to be parsed, simplifying the parsing process. RRG has a strong link with semantics and the grammatical constructs are designed to be both cross-linguistically valid and to make the meaning relatively easy to extract. The grammatical constructs are based on templates rather than rules. This means that more information can be encoded into the grammatical construct which in turn makes the meaning easier to extract.

However, there are aspects of RRG which make it harder to implement. It is much harder to parse with templates than with rules, and RRG templates are particularly hard because lines are allowed to cross and the parse trees are not simply made up of parents and children, but nodes can have modifiers (such as PERIPHERY) attached to them. In addition, although RRG says nothing explicit about word order constraints, they are implicit in the templates in that the theory contains examples from many languages which include fixed and free word order, and varieties in between.

Existing parsing techniques are not suited to solve all these problems without modification. Most parsing algorithms such as those based on HPSG and probabilistic

context free grammar are based on rules. Although templates can easily be reduced to rules, a lot of information is lost. The other main problem is the word order flexibility. The two most popular parsing grammars are HPSG (Hou & Cercone 2001; Kešelj 2001; Wahlster 2000) and dependency grammar (Covington 2003). HPSG is good for fixed word order, but poor for free word order, and dependency grammar is good for free word order, can do fixed word order, but it is difficult to enforce other constraints. Which of these methods is chosen depends on the language: dependency grammar is popular for free word order languages such as Czech (Holan 2002) and Korean (Chung & Rim 2003; Chung & Rim 2004), while HPSG is the method of choice for many other languages. However some languages, such as Japanese have had work done using both methods (Ito et al. 2001; Kanayama et al. 2002) (Wahlster 2000). Other methods exist, which match the spirit behind RRG more closely. For example, Grootjen (Grootjen 2001) classifies words into 3 classes: predication, modification, and qualification and relates these words in a bottom up fashion. It works quite well on English headline titles, but has not been tested on more complex sentences. Galicia Haro et al. (Galicia-Haro et al. 2001) combine dependency and constituency resources. It is based on a standard context free grammar, government patterns, and a semantic network which provides the relationship between words. However, it still suffers from the problems of rules and varying degrees of word order flexibility.

In this paper a new parsing method is described. This method is based on a chart parser, which is an old but effective parsing algorithm, which can be modified to handle the unification used in HPSG (Jurafsky & Martin 2000). The chart parser has been modified to handle both templates and varying degrees of word order flexibility and is used to parse the main constituents once the modifying words have been taken away. Modifying words are removed via a relatively simple process that finds related words using information about the grammar of the language stored in a file.

2.   Outline of the parsing algorithm

The parsing algorithm consists of several stages.

1.   Use Toolbox (available from SIL: http://www.sil.org/computing/toolbox) to tag the sentences. Toolbox is a semi-interactive tagging program. It was chosen because the user can define their own tags and because it is easy to ensure all tags are correct (Toolbox asks the user if there is more than one possibility for a word).
2.   Strip the operators. This part removes all words that modify other words. It is based on a correct tagging of head and modifying words. Which modifying tags belong to which head words are specified in a file. The end result of this stage is a simplified sentence.
3.   Parse the simplified sentence using templates. This is done by collapsing the templates to rules, parsing using a chart parser and then rebuilding the trees at the

end. The chart parser has been modified to handle varying degrees of word order flexibility.

4.   Draw the resulting parse tree.

3.   Stripping the operators

Before a sentence is parsed, its words are divided into predicates and operators and the operators are attached to their predicates. Predicates are words that are modified by operators. So for example adjectives are operators for nouns. In many languages, operators do not always occur immediately next to their predicates. For this reason, the scope of the search for the operators for a particular word may include the whole of the clause. However, this is not always the case. For example, in English the modifying words for nouns always occur immediately before the noun.

In order to provide some information about where operators may occur for any given language, the predicates and their associated operators are specified in a grammar file. Examples of such a file for English and Dyirbal are given in figure 1.

This file also specifies the strategy for locating operators. There are four search types:

> BEFORE CONTIGUOUS
> AFTER CONTIGUOUS
> BEFORE NON_CONTIGUOUS
> AFTER NON_CONTIGUOUS

Up to two of these types will be needed depending on whether or not the operators occur before or after their predicate and whether they are next to (CONTIGUOUS) or separated (NON_CONTIGUOUS) from their predicate. For example operators for English nouns occur immediately before the noun so the search strategy is BEFORE CONTIGOUS; for French where adjectives can occur before or after the noun, two search strategies are required: BEFORE CONTIGUOUS and AFTER CONTIGUOUS. For languages with free word order, such as Dyirbal, where operators can occur anywhere in the sentence, the search strategy is BEFORE NON_CONTIGUOUS and AFTER NON_CONTIGUOUS.

The algorithm for attaching operators to predicates is as follows. The sentence is searched from left to right. When a predicate tag is found the search strategy for this tag is employed to locate any operators. If the search strategy is BEFORE CON-TIGUOUS then the search looks back from the predicate and attaches all words with appropriate operator tags to the predicate. The search stops when a word with a tag that is not in the list of operator tags is found. If the search is NON_CONTIGUOUS then the search continues until the start of the clause is reached. Note that as operators are attached to their predicates, they are removed from the sentence. An example of removing operators from an English sentence is shown below.

```
#
# OPGrammar file for English
#

@IGNORE 3S PL

@PREDICATE N PN
@OPERATORS DET QNT ADJ NUM
@SKIP CONJ
@INSERTHEAD CONJ DET NUM :
ADJ
@TYPE BEFORE CONTIGUOUS

@PREDICATE V V1 V2 V3 V12 V23
@OPERATORS AUX PAST CONT
NEG
@TYPE BEFORE NON_CONTIGUOUS
@TYPE AFTER CONTIGUOUS

@NEXT_PASS

@PREDICATE AUX
@OPERATORS PAST NOT
@TYPE AFTER CONTIGUOUS
```

```
#
# OPGrammar file for Dyirbal
#

@IGNORE G.1 G.2

@PREDICATE N
@OPERATORS DEIC
@DEFAULT CASE C.ABS
@TYPE BEFORE NON_CONTIGUOUS
@TYPE AFTER NON_CONTIGUOUS
@TYPE AGREEMENT CASE

@PREDICATE V V1 V2 V3 V12 V23
@OPERATORS TNS
@TYPE AFTER CONTIGUOUS
```

Figure 1. Grammar files for English and Dyirbal.
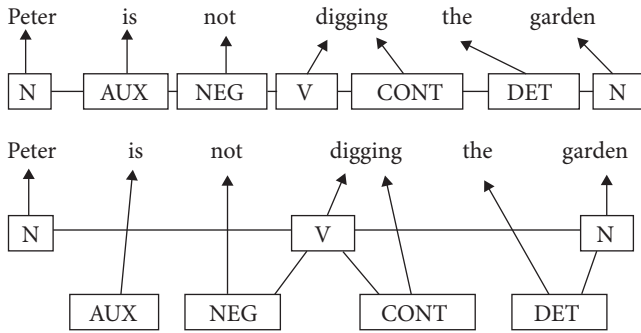
Notice that when the operator removal process is complete only the tags N V N are left in the sentence. This is clearly much easier to parse than the original list of tags.

An example for Dyirbal is shown below. The sentence means "The man (yaraŋu) saw the woman (dyugumbil).

Balan	dyugumbil	buran	baŋgul	yaraŋu.
ba-la-n	dyugumbil	bura-n	ba-ŋgu-l	yara-ŋgu
DEIC-C.ABS-G.2	N	V2-TNS	DEIC-C.ERG-G.1	N-C.ERG
Deic-ABS-G.2	woman	see-TNS	deic-ERG-G.1	man-ERG
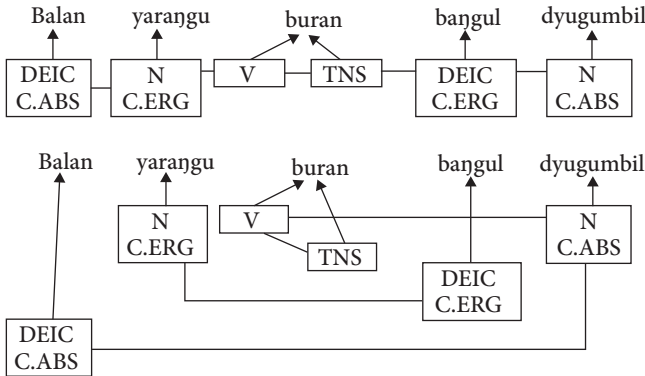
Notice how the nouns are matched up according to their cases. This is done with the additional search type AGREEMENT CASE. In Dyirbal absolute case is the default case and is often not marked. This means that the absolutive case has to inferred for "dugumbil". This is achieved with the additional line

"@DEFAULT CASE C.ABS".

Noun phrases can be quite complicated. A couple of extra search routines have been added to handle things like a "red and yellow tulip" or "two red and three yellow

tulips". In the first instance the conjunction "and" is used to join two adjectives. Normally "and" would mark the end of the noun phrase because it is often used to join two clauses. This source of confusion is solved by the addition of

@SKIP CONJ

This line means that if you find CONJ between two identical tags from the list of operator tags then, skip over CONJ, and include it in the list of operators. An example of the use of this feature is shown below.

I found a red and yellow tulip

| PRO | V | PAST | DET | ADJ | CONJ | ADJ | N |

I found a red and yellow tulip

| PRO | V | | | | | | N |
| PAST | | DET | ADJ | CONJ | ADJ |
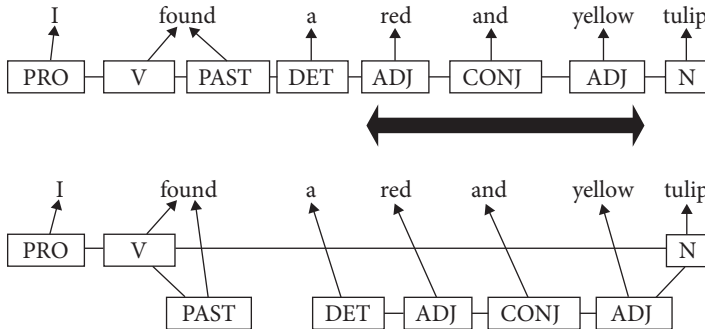
In the second case, "two red and three yellow tulips", there is a noun missing. This will not parse correctly unless the missing noun is added. The addition of the search routine @INSERTHEAD solves this problem:

@ INSERTHEAD CONJ DET NUM: ADJ

This means that if you find a CONJ preceded by a DET or a NUM and followed by an ADJ then insert a predicate tag before the ADJ. The predicate tag is given by the one currently under investigation. Note that this follows the search direction, which is from right to left in this example:

I found two red and three yellow tulips

| PRO | V | PAST | NUM | ADJ | CONJ | NUM | ADJ | N |

I found two red Ø and three yellow tulips

| PRO | V | | | N | CONJ | | | N |
| PAST | NUM | ADJ | | NUM | ADJ |
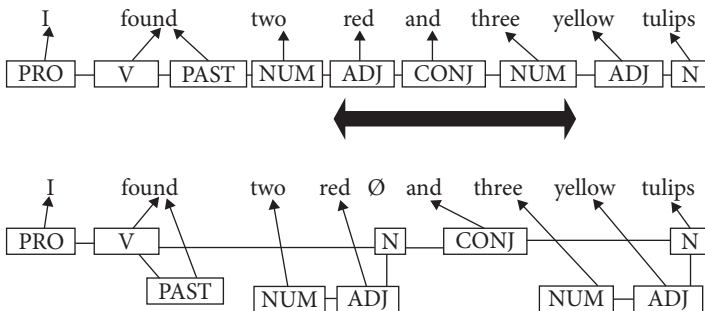
For languages (such as English, and many other European languages) that use auxiliaries both as modifiers of a main verb and as a stand alone verb when there is no main verb, a single pass will not pick up the auxiliary as a predicate because AUX is listed in a

list of operators, not predicates. To solve this problem, provision is made for more than one pass through the sentence. On the first pass, main verbs are sought and their operators are attached to them. The second pass can mop up any AUX that are left over.

Example:
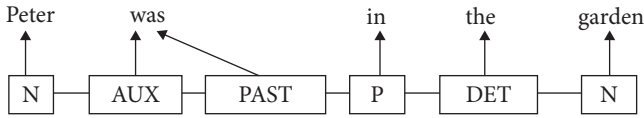
The first pass simply removed the DET and attaches it to the N.
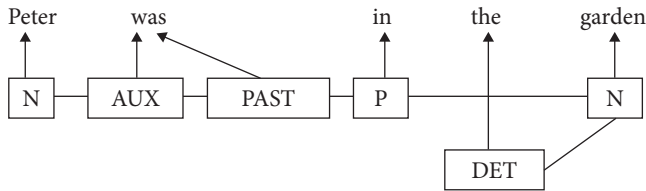
On the second pass, AUX is identified as a predicate and past is attached to it.
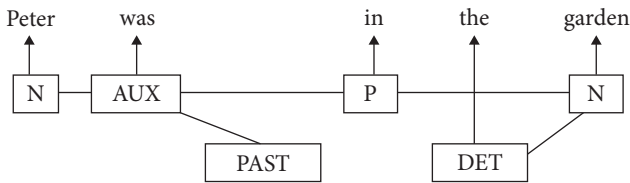
4.   Basic chart parser

A chart parser, or the Earley algorithm is an old, but efficient method for parsing. It is a method of ensuring that all appropriate rules get applied to the data so that all possible parses are found. This is done in a systematic way. The chart parser was chosen as the basis for RRG parsing because of its simplicity and efficiency. However, it has been modified to handle templates (rather than rules) and variable word order flexibility. Note that it does not attempt to model how people parse sentences.

The chart parser is described in most books on natural language processing (e.g. (Allen 1995; Jurafsky & Martin 2000)), but we include it here so that the modifications can be better understood. The modified chart parser took as its basis code developed by David Perelman-Hall and Jamshid Afshar. The code can be obtained from the internet via a search for the file "chartp10.zip". The basic chart parsing algorithm described here describes the implementation found in this code.

A chart parser consists of two main objects: a chart and an agenda. It is designed to parse rules, which are contained in a list. The agenda and the chart contain "edges". Edges contain a start index, a finish index which refer to the position in the sentence, a parse tree, and a list of items that need to be satisfied for the rule to be complete. For, example, given the sentence "John ate pizza", 3 initial edges are added to the agenda:

> [0] john [1]
>
> [1] ate [2]
>
> [2] pizza [3]

where the numbers indicate the positions (start and finish) in the sentence. These edges are "inactive" because the list of items that needs to be satisfied is empty. Edges that have items that need to be satisfied are "active".

The agenda holds a list of edges to be considered. These edges are fed to the chart one at a time for processing. The result of processing an edge is that this edge gets added to the chart, and often other edges are generated and placed on the agenda. New edges are generated either by combining the edge with another edge in the chart or by locating rules that apply to the edge that has just been added. When an edge is combined with another edge a (partial) parse tree is generated often by combining two partial parse trees and the start and finish indices are updated because the rule will now cover more of the sentence.

The chart consists of a list of active edges and a list of inactive edges. This distinction is important because active edges can only combine with inactive edges and vice versa. The list of rules is consulted only when an inactive edge is added to the chart. If an applicable rule is found, a new edge is created from the rule and added to the agenda. After an edge has been processed, the chart takes the last edge that was added to the agenda. If this last edge was a rule, then the rule edge immediately gets combined with the last edge that was processed.

When the agenda is empty and there are no more edges to process, the parse trees can be obtained from the chart by looking for inactive edges with the appropriate goal (generally S or SENTENCE) at the top of the tree.

The important methods in this process are those for combining edges and those for finding rules that apply. It is these methods that have been modified in order to enable parsing with templates and parsing with varying degrees of word order flexibility.

5.　Parsing templates

The reason for parsing with templates rather than rules is that templates contain a lot more information. In addition, RRG contains peripheries and links which do not fit into trees in the normal way but via arrows, as illustrated in figure 2 which shows an

automatically generated parse tree. Also, by using a template, it is easier to ensure that in sentences with a PreCore Slot, for example, an argument really is missing from the CORE. However, parsing with templates is much harder than with rules. The approach taken here is to collapse all the templates to rules and then to re-build the correct parse tree once parsing is complete. This is done by including the template tree in the rule, as well as the left and right hand sides. When rules are combined during parsing, we make sure that the right hand side elements of the instantiated rule, as represented in the partial parse tree, point to the leaves of the appropriate rule template tree. This is especially important when the order of the leaves of the template may have been changed. The reference number for the rule that has been applied is also recorded so that it can be found quickly.
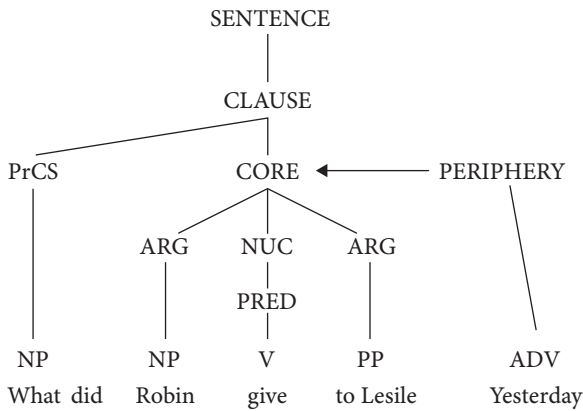
Figure 2. An example parse tree that has been generated automatically.

Modifying nodes, such as PERIPHERY, cause problems with rebuilding the tree. This is because such nodes can occur anywhere within the template, including at the root and leaf levels. Also, if we are dealing with a sub-rule whose root node in the parse tree has a modifying node, it is not possible to tell whether this is a hang-over from the previous template, or part of the new template. To solve this problem, modifying nodes have flags to say whether they have been considered or not. There is a potential additional problem with repeated nested rules because if processing is done in the wrong order, the pointers to the rule template tree get messed up. To overcome this problem, each leaf of a template is dealt with before considering sub-rules.

The algorithm for building the tree is:

1. Get the appropriate rule and rule template tree.
2. If the rule tree is of depth 1 and has no embedded modifying nodes (that is modifying nodes that point to a node other than the root), then we can simply continue by looking at each of the children in turn, starting at step 1.

3. If the rule tree is of depth greater than 1 or there are embedded modifying nodes, then make the rule template tree point to the appropriate places in the parse tree. This is done using the links made from the parse tree to the rule template tree during parsing. Note that the parse tree will consist of simple rule structures of depth 1 and modifying nodes will show up as children.

4. Clear all the children in the parse tree. This will have the effect of removing any embedded modifying nodes.

5. Copy all the children of the template tree and copy into the appropriate place in the parse tree.

6. If the template has modifying nodes, copy that part of the template tree and insert into the appropriate place in the parse tree.

7. Replace the leaves of the copied template trees with the original leaves. This is possible because the template leaves are pointing to the original leaves (step 3).

8. Consider each leaf in turn, modifying the parse tree as above (start at step 1 for each leaf).

6.   Parsing with fixed, free, and constrained word order

There were two main problems to solve in order to modify the chart parser to handle varying degrees of word order flexibility:

1. Working out a notation for denoting how the word order can be modified.
2. Working out a method of parsing using the this notation.

(1) was achieved by the following notation on the ordering of the leaves of the template, treating the template as a rule.

– Fixed word order: leave as it is.
– Free word order: insert commas between each element {N,V,N}. (Note that case information is included as an operator so that the undergoer and actor can be identified once parsing is complete.)
– An element has to appear in a fixed position: use angular brackets: {N, ⟨V⟩, ADV} this means that N and ADV can occur before or after v, but that V MUST occur in 2nd position. Note that this is 2nd position counting constituents, not words.
– Other kinds of variation can be obtained via bracketing. So for example {(N,V) CONJ (N,V)} means that the N's and V's can change order, but that the CONJ must come between each group. If we had {(N,V),CONJ,(N,V)} Then the N's and V's must occur next to each other, but each group doesn't not have to be separated by the CONJ, which can occur at the start, in the middle, or at the end, but which cannot break up an {N,V} group.

6.1   Modifications to the parsing algorithm

Parsing was achieved via a structure that encoded all the possible orderings of a rule. So for example the rule CORE→N, V, N would become
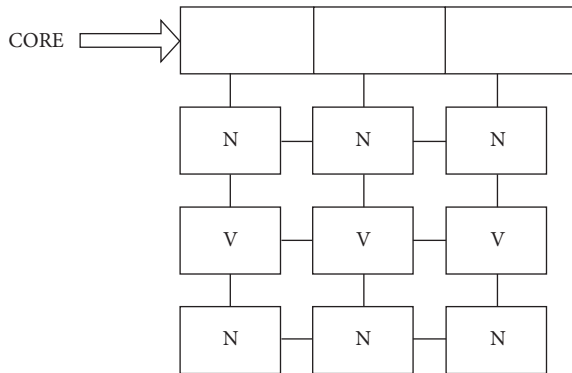
This means that N or V can occur in any position and N has to occur twice. The lines between the boxes enable the "rule" to be updated as elements are found.

Using this schema, SENTENCE→(N,V) CONJ (N,V) would become
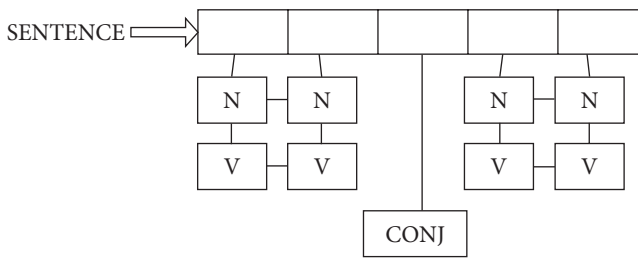
In this case, the CONJ in the middle is by itself because it has to occur in this position because the grouping word order is fixed. The groupings of N's and V's show where the free word ordering can occur.

To apply a rule, the first column of the left hand side of the rule is searched for the token. Any tokens that do not match are deleted along with the path that leads from them. In the first example, after an N is found, we would be left with
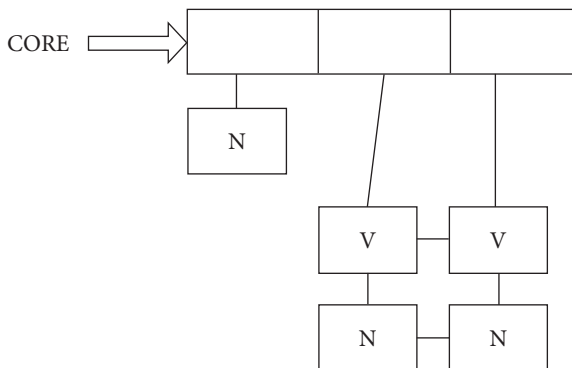
And in the second example, after an N is found we would be left with
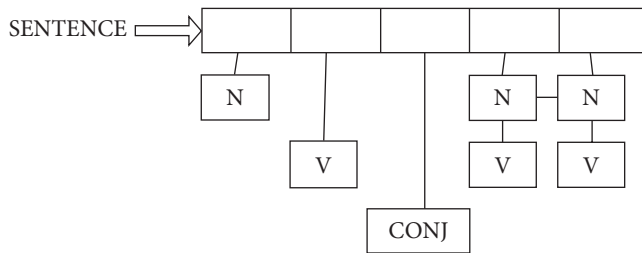
Note that in order for the rule to be satisfied, we *must* find a V and then a CONJ: there are no options for position 2 once the element for position 1 has been established.

In this way, we can keep track of which elements of a rule have been found and which are still to be found. Changes in ordering with respect to the template are catered for by making sure that all instantiated rules point back to the appropriate leaves of the rule template, as described above.

The different possibilities for each rule are obtained via a breadth first search method that treats tokens in brackets as blocks. Then the problem becomes one of working out the number of ways that blocks of different sizes will fit into the number of slots in the rule.

7. Results

The above algorithms have been implemented in C++ and tested on example sentences from Dyirbal (free word order), English (fixed word order), and an incorrect but plausible, given the examples, analysis of Dutch. The latter is to illustrate fixing a constituent in 2nd position. No claim is made for correct RRG analysis in any of these examples: the aim is to show that parsing according to this paradigm works.

Below, we give the templates and rules used for parsing, followed by some example parses. This list of templates is not intended to be exhaustive for that particular language.

7.1 Dyirbal

Dyirbal templates used for parsing are shown in figure 3 and sample parse trees are shown in figure 4. These parse trees show that the parsing algorithm will handle free word order and that the operators to the constituents do not have to be contiguous or even in the correct order. The sentence means "The man (yarangu) saw the woman(dugumbil)".

SENTENCE

CLAUSE

SENTENCE→CORE

CLAUSE

CORE

CLAUSE→CORE

CORE

ARG   ARG   NUC

NP   NP   PRED

V2

CORE→NP,NP,V2

CORE ← PERIPHERY

ARG   ARG   NUC   NP

NP   NP   PRED

V2

CORE→NP,NP,V2,NP

CORE

ARG   NUC

NP   PRED

V1

CORE→NP,V1

CORE ← PERIPHERY

ARG   NUC   NP

NP   PRED

V1

CORE→NP,V1,NP
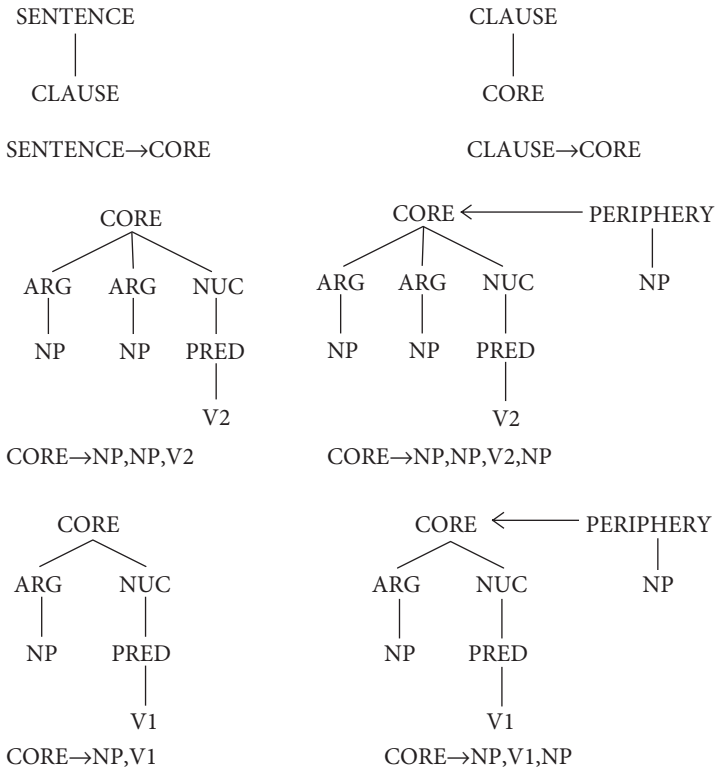
Figure 3. Dyirbal templates.

7.2   Dutch

The Dutch examples consist of 4 example sentences all of which mean "We will go to town tomorrow":

Wij gaan   morgen naar de   stadt.
N   V2 -1PL   ADV   P   DET N

Morgen gaan   wij naar de   stadt.
ADV   V2 -1PL   N   P   DET N

Naar de   stadt gaan   wij morgen.
P   DET N   V2 -1PL   N   ADV

*Naar   de   stadt wij gaan   morgen.
P   DET   N   n   V2 -1PL   ADV

```
                        SENTENCE
                            |
                         CLAUSE
                            |
                          CORE
                 ┌──────────┴────┐────┐
               ARG            ARG   NUC
                |              |     |
               NP             NP   PRED
                |              |     |
         Baŋgul   yaraŋgu   balan  dyugumbil  buran.
              └·······┘        └·······┘          ┆
```

```
                        SENTENCE
                            |
                         CLAUSE
                            |
                          CORE
                 ┌──────────┼──────────┐
               ARG         NUC        ARG
                |           |          |
               NP         buran       NP
                |           ┆          |
           dyugumbil             balan  N
                                  ┆     |
                └···········┘              └··· yaraŋgu.
                      baŋgul
                        └··································┘
```
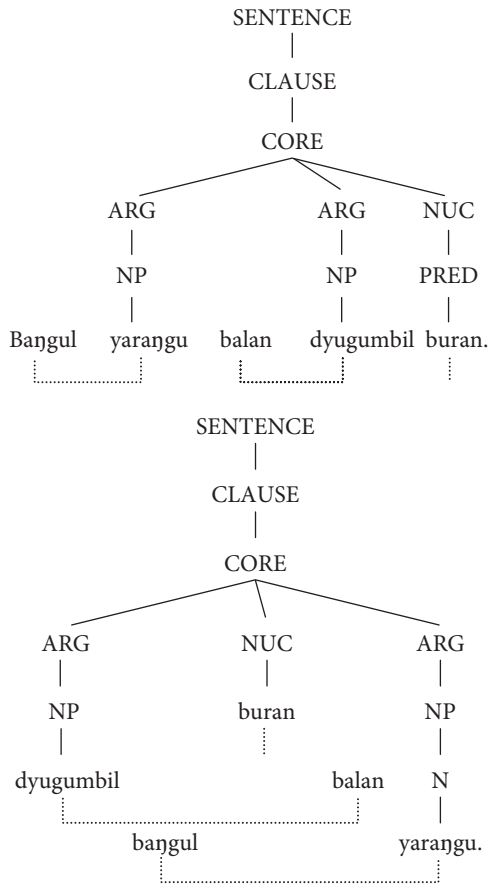
Figure 4. Sample Dyirbal parse trees.

```
              CORE  ←──────────── PERIPHERY
          ┌────┼────┐──────┐
        ARG   NUC  ADV    ARG
         |     |           |
        NP   PRED         PP
               |
              V2
        CORE→NP, ⟨V2⟩, ADV, PP
```
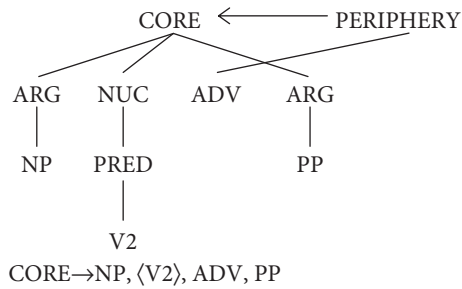
Figure 5. The template used for parsing the Dutch examples.

The last sentence is ungrammatical. The analysis we will use for this is that the verb must occur in second position, but that otherwise it is a free word order language (which is not actually correct) and for this we use the template in figure 5:
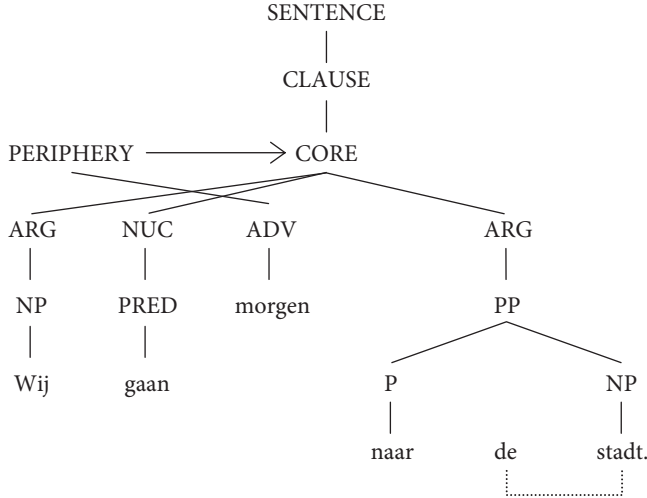
Figure 6. Example parse tree for Dutch.

As expected, all examples parse except the last one, where the main verb, *gaan*, is in 3rd position. An example parse tree is shown in figure 6. Note that this example also shows that this method of parsing handles crossing lines in the parse tree.

7.3   English

Templates for parsing English are given in the appendix. The sentences in figures 7 and 8 have all been automatically parsed and the parse trees drawn automatically. These sentences have been chosen to show parsing of complex sentences. The sentence in figure 8 shows how the dummy N is used in order to parse the sentence.

8.   Conclusions and future work

Extensions to the chart parsing algorithm to handle templates and varying degrees of word order flexibility have been presented along with some sample parses. We have shown that this method can handle both free and fixed word order with no difficulty as well as various things in between. It is not known whether or not the options available to specify constraints on the word order are sufficient for all languages as this aspect has not been fully tested. Further work is needed in this area.
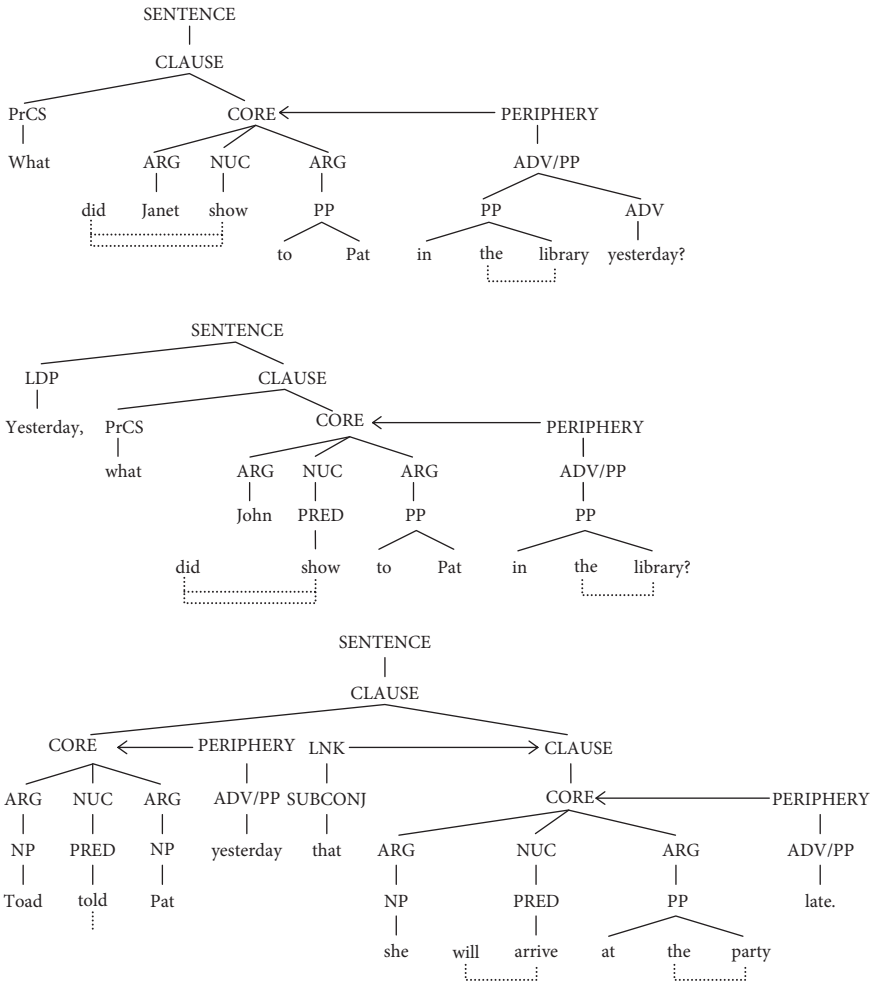
Figure 7. Example parse trees for English.

The chart parser has been modified to handle templates with the complications of modifiers and crossing lines and the examples above show that this algorithm works well. However, improvements can be made: it would be nice to be able to specify optional aspects, such as the periphery to reduce the number of templates needed. In addition, at present multiple conjunctions result in multiple trees, but strictly speaking, this should not occur in RRG because there is no difference in meaning. Fixing this problem is not trivial because it results from the multiple application of a template. It should be possible to pick this up while inserting the template trees into the parse tree by checking to see if the same template has been applied twice in succession.
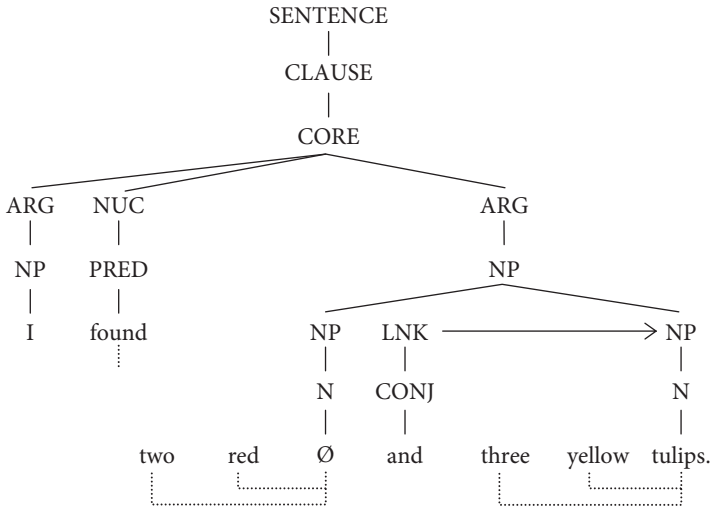
Figure 8. Example parse tree for English with a dummy N.

This would mean that parsing would produce multiple identical parse trees, but it is not difficult to check these for equality. However, this could also be picked up as soon as the meaning is extracted from the parse tree and thus it may not be necessary to do it at the parsing stage.

Appendix

Templates for parsing English are shown below. The rules are not shown because English can be analysed as fixed word order.
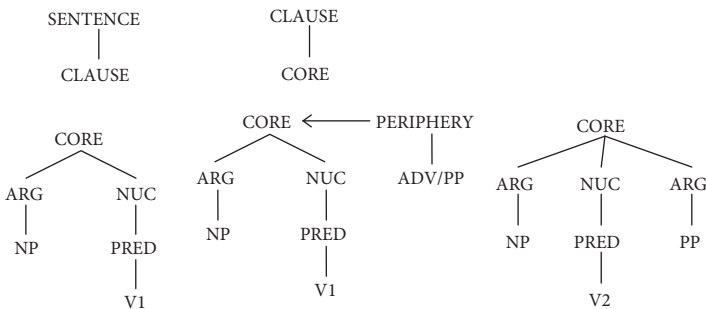
(*Continued*)

Appendix (Continued)

```
        CORE                      CORE ←——— PERIPHERY
   ARG  NUC  ARG             ARG  NUC  ARG        |
    |    |    |               |    |    |      ADV/PP
   NP  PRED  NP              NP  PRED  NP
         |                         |
         V2                        V2
```

```
        CORE                  CORE                     CORE                        CLAUSE
   ARG  NUC  ARG         ARG  NUC  ARG         ARG  NUC  ARG  ARG             PrCS        CORE
    |    |    |           |    |    |           |    |    |    |               |      ARG      NUC
   NP  PRED  PP          NP  PRED  NP          NP  PRED NP   PP               WH     NP       PRED
         |                     |                     |                                          |
        AUX                   V12                    V3                                         V2
```

```
        CLAUSE
   PrCS        CORE ←——— PERIPHERY
    |      ARG      NUC        |
   WH     NP       PRED     ADV/PP
                    |
                    V2
```

```
        CLAUSE                        CLAUSE
   PrCS        CORE             PrCS       CORE ←——— PERIPHERY
    |      ARG NUC ARG           |      ARG NUC ARG        |
   WH     NP  PRED PP           WH     NP PRED PP       ADV/PP
                |                           |
                V3                          V3
              NP                                              CLAUSE
        NP   LNK → NP                                  CORE   LNK →  CLAUSE
              |                                               |
            CONJ                                           SUBCONJ
```

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A Role-Lexical Module (RLM) for Biblical Hebrew

A mapping tool for RRG and WordNet[1]

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The Role-Lexical Module (RLM) is a new Web application designed to map lexical meaning from syntax to semantics and to parse a Hebrew text. This tool enables the linguist to decompose meaning according to the notion of semantics in Role and Reference Grammar. Work by programmers Chris Wilson and Ulrik Petersen allows us to exploit WordNet for definition of glosses. On this basis the linguist can classify verbs into Aktionsart classes, represent the meaning of clauses following a selection of Logical Structure, and gradually build an RRG lexicon for Biblical Hebrew. The potential and procedures are illustrated in analyses of the verbs of killing, creation and seeing in Biblical Hebrew. This tool helps us map from syntax to semantics in a closed corpus in the database of the Werkgroep Informatica of the Vrije Universiteit in Amsterdam.

Ever since linguists gained access to computational processing power, we have wanted to exploit these tools for our study. A quarter of a century after the appearance of the first PCs, most of us run simple commercial language software, but we rarely deal with meaning and text beyond simply storing and retrieving interpretations which we already knew anyway. Indeed, we are still debating how to parse and explain syntax, and especially how to represent meaning – trying to figure out which information architecture can best satisfy our linguistic and lexical demands. How do we really do IT?

Solutions for such aspirations will guide the following tour through the jungle – namely, the storage and retrieval of lexical representation. The goal is to pave the way from syntax to semantics for linguists working within the structuralist-functional theory known as Role and Reference Grammar (henceforth RRG), and currently set out in its most recent version by Van Valin (2005). This grammar was formulated to offer a smooth bidirectional linking between syntactic structure and the representation of semantic structure in the lexicon through mapping rules. It rejects an autonomous and binary deep structure ripped apart from linguistic expressions or restricted solely to data from English. The theory was designed for a clear, formal representation of meaning and structure in all languages, and the challenge of representing meaning in a machine-readable and logical format is in many ways also one of the crucial tasks for the theory today.

Within this framework I will propose my Role-Lexical Module (RLM) as a new way to represent lexical content and integrate it into the theory. Since the module is being developed during experimental work on Biblical Hebrew, I will discuss how this module handles data from this language. The challenge of lexical representation has been a live issue in RRG circles for more than a decade. I will trace current solutions right up to the most recent proposals by scholars like Guest & Mairal (2005), and discuss their pros and cons. On this background I will introduce a computational tool that handles the representation of meaning in a way which is closer to the core of RRG and integrates the original Functional-Lexical Module (FML) developed by Faber & Mairal (1999). Exploiting a linguistic database of Biblical Hebrew and using technology to tie into the lexical representations in WordNet, our new tool allows us to map verb-specific roles from syntax into the semantic format specified by RRG. The new tool will store the basic lexical meanings of verb classes in the highly formal semantic metalangue of RRG and offer a lexical representation of meaning in actual linguistic contexts through a WordNet glossing. We offer this new module as an RRG-compatible tool for parsing, lexical representation, and verb class decomposition.

Biblical Hebrew (BH) was an obvious language choice for this new computational tool. For years I have worked closely together with Chris Wilson on mapping Biblical Hebrew syntax into semantics, although our ultimate goal is to develop tools that will assist in RRG analysis for all languages (Wilson, Ms). The RLM for BH tool uses the electronic database for Hebrew under construction for more than a quarter of a century by the Werkgroep Informatica at the Vrije Universiteit (WIVU) in Amsterdam (Talstra & Sikkel 2000). This database was used for an RRG analysis of interclausal relations described in Winther-Nielsen (1995: 96–104), but so far there has been little work on intraclausal Hebrew semantics from a RRG perspective.

The Web application of RLM for BH shown in Figure 1 is accessible at http://lex.qwirx.com/lex/clause.jsp. A linguist can choose any clause from Genesis 1–3 in the Hebrew machine-readable consonantal text from WIVU with simple translation glosses and can then perform various computer-aided analyses.
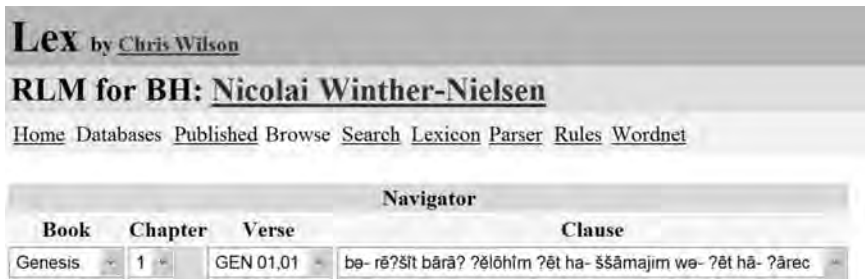
Figure 1. The Web application RLM for BH.

The RLM tool offers various kinds of data listed in (1). These components will be explained and discussed in the following presentation of mapping from syntax to semantics in Biblical Hebrew.

(1) a. WordNet lexical selector
     b. text display of transliterated and glossed Hebrew
     c. syntactic parser for RRG
     d. Logical Structure decomposer
     e. FLM-selector

The organization of this paper is as follows: after a brief account of the background and history of lexical representation in RRG, we will look first at a new proposal to exploit WordNet for lexical description and how this is handled in RLM. Secondly, we will describe how the text displayer and parser RLM handles the lexical decomposition of verbs of killing. Thirdly, we will look into the Logical Structure selector for the Hebrew verb of seeing and the FLM-selector for the Hebrew verb of creating.

1.   Probing for a new lexical semantics in RRG

Ever since the earliest days of RRG, this theory has focused on integrating semantic decomposition as part of the syntax-semantics-pragmatics interface of the grammar (Foley & Van Valin 1984: 34–40). The particular variety of lexical decomposition in this grammar can be illustrated by the much discussed relationship between verbs like *die* and *kill* in (2).

(2) a. State (STA)   *be dead*   **dead′** (x)
     b. Achievement (ACH)   *drop dead* INGR **dead′** (x)
     c. Accomplishment (ACC)   *die*   BECOME **dead′** (x)
     d. Causative Accomplishment (CauACC) *kill*   [**do′** (x, Ø)] CAUSE [BECOME **dead′** (y)]
     e. Causative Achievement (CauACH)   *execute*   [**do′** (x, Ø)] CAUSE [INGR **dead′** (y)]

f.   Causative Accomplishment (CauACC) *murder*   DO (x, [**do′** (x, Ø)]
                                                    CAUSE [BECOME
                                                    dead′ (y)]

The verb *kill* in (2d) may be derived from the verb *die* (2c) by a lexicalization rule for causation, and the primitive predicate is placed next to a notation which captures the unspecified activity which lies behind the causation (Van Valin & LaPolla 1997: 110, 159). Different verb classes are distinguished by means of logical operators like INGR (ingressive) for instantaneous death, or BECOME when a process of dying terminates (1997: 113). The verb *murder* in (2f) deviates from the usual Effector argument in a Logical Structure with CAUSE, because English lexicalizes a strong notion of agency which results in the use of the AGENT argument.

This notation represents the standardized logical structuring of meaning. However, since the early nineties, studies have tried to capture much more semantic richness. Van Valin & Wilkins (1993: 511) proposed a way to formalize the crucial semantic distinctions involved in a verb like *remember* in a crude, semi-logical paraphrase like (3):

(3)   **BECOME think.again′** (x) **about.something.be.in.mind.from.before′** (y)

This line of reasoning was continued into the new version when Van Valin & LaPolla (1997: 109) proposed some highly complex representations of lexical meaning, as in (4a–b), which is an attempt to grasp the content of a verb of transformation. Other similar very complex verb analyses were offered for *say* (1997: 117), for the implement argument additions involved in cutting with a knife or eating with a spoon (1997: 121), and for exerting force with an implement as in (5a–b) (Van Valin 2005: 59).

(4)   *carve into X*
      a.   *The man carved the log into a canoe/the canoe out of a log*
      b.   [**do′** (man, [**carve′** (man, log)])] CAUSE [BECOME NOT **exist′** (log) &
           BECOME **exist′** (canoe)]

(5)   *smash with X*
      a.   *Lislie shattered the window with a rock*
      b.   [**do′** (Leslie, Ø)] CAUSE [[**do′** (rock, Ø)] CAUSE [INGR **shattered′** (window)]]

These proposals inspired some new important attempts to refine lexical representation for RRG. It started with Mairal Usón & Van Valin (2001) and Mairal Usón & Faber (2002), who suggested that the Functional Lexical Module (FLM) could be reworked to fit as a lexical semantic refinement for RRG. To exemplify this idea, the FLM proposal of Faber & Mairal Usón (1999) used the dictionary definition of *drink* "to consume liquid, taking it into one's mouth and swallowing it". This definition was translated into a new semantic analysis which covered the implicit meaning structure of several verbs for ingesting fluid food such as *drink, imbibe, gulp, quaff, swig, swill, guzzle, tipple* and *sip* (Mairal 2003). In the case of (6a), the effector (*x*) carries out an activity which causes some food (*y*) to get into *x's mouth* and *y* becomes consumed.

Furthermore, **take′** in (6b) is decomposed into a causation of a contact and the posses-
sive phrase is in RRG fashion translated into **have.as.part′**.

(6) a. **do′** (x, [**take′**.(α).**into one's mouth**.(β).**in**.(δ).**manner′**] (x,y) & INGR
     consumed′ (y) α = y

  b. **do′** (x, [CAUSE (BECOME [**be-in′**.([**have.as.part′**.(x, **mouth**)], α).**in**.(β).
     manner′] (x,y)))] & INGR **consumed′** (y) α = y

More recent proposals explore different solutions and clearly testify to the ex-
perimental flux that seems to exist at the moment. One new solution was proposed
by Mairal Usón & Faber (2005), who complemented the verb classifications of RRG
with operators derived from Mel'cuk's Lexical Functions (e.g., magn, instr). However,
this attempt was soon overtaken by another proposal by Guest and Mairal Usón (2005:
126–127), who wanted to dispose of endless *ad hoc* lists of semantic primitives lacking
a standard procedure for codification. They argued for a completely new proposal
based on the mathematical notion of intervals, tying a double ontology of predicates
and objects into open-ended sets using distinctions from fuzzy logic. This can best be
illustrated by the new notations for *eat* and *swallow* (2005: 160–161). The formaliza-
tion of *eat* in (7a–b) expresses a sequential action whereby the actor moves the patient
into his own mouth and then swallows it, thereby consumes it. The formalization of
swallow in (8a–b) expresses the fact that the patient is already present in the mouth of
the actor who moves the food to the stomach for it to be consumed.

(7) *eat*

  a. SEQUENCE: **do**(X, **move**(X,Y)) CAUSE **loc**(Y, mouth ∈ X) **do**(X,
     swallow(X,Y))

  b. RESULT: NOT **exist**(Y)

(8) *swallow*

  a. ASSUMPTION: **loc**(Y, mouth ∈ X)

  b. ACTION: **do**(X, **move**(X,Y) CAUSE **loc**(Y, stomach ∈ X))

  c. RESULT: NOT **exist**(Y)

This new proposal is a radical departure from the earlier interface of semantics
through lexical representation in RRG. It remains to be seen how RRG would work
if built around a core of primitive predicates like *think, know, want, feel, see, hear, say,
do, happen, move, touch*. Those primitives were introduced by Mairal Usón & Faber
(2005) and are carried over more or less without discussion into the Universal Lexical
Metalangue (ULM) proposed by Guest & Mairal Usón.[2] This list seems to be heavily

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2. Guest and Mairal Usón do not use this term, but rather the descriptive "universal semantic
language" (2006: 135) and in the title, but in personal communication Guest has told me that the
name for the framework is ULM.

influenced by the Universal Semantic Primes (USP) proposed in Wierzbicka (2003: 8; cf Table 1 below) – even if it admittedly is "by no means exhaustive and needs further work" (Guest & Mairal Usón 2005: 144). If one compares the list of primitives in USP with the table of thematic relations in Van Valin (2005: 55), it seems clear that RRG has a much finer grained area of predicate distinctions and these logical spaces are tied much closer into the semantics and the syntax of RRG. The USP framework reduces the prototypical predicate domains to 7 mental states and 4 activities, while ULM at this early stage has not yet dealt with cultural primes for life, death and modality as shown in Table 1.

Table 1. A comparison of primitive predicates in USP and ULM

	Universal semantic primes (USP)- Wierzbicka 2003	Universal Lexical Metalanguage (ULM) Guest-Mairal (2006)
Mental predicates	*think, know, want, feel, see, hear*	
Speech	*say*	
Actions, events, movements	*do, happen, move*	
Space	*touch* (contact)	*~ touch?*
Existence and possession	*there is, have*	
Life and death	*live, die*	
Logical concepts	*can*	

These culturally based distinctions of domains are not directly commensurable with the current version of RRG which has remained true to the basic principles of Dowty's verb semantics. Van Valin and LaPolla claimed that the RRG decomposition into logical structure offers an "extremely powerful yet highly constrained" representation of meaning (1997: 109). Today we realize that even if lexical decomposition in RRG may be richer than the systems offered by many competing theories, it still remains a "first approximation" (Van Valin 2005: 46). Canonical RRG envisioned a deeper lexical semantic analysis that could capture some of the insights from the early studies of a full specification of the meaning of verbs like *say, carve out of* and *eat with,* but so far the 1997 version has not been replaced by a new paradigm for logical specification of meaning.

It is commendable that Guest and Mairal are exploring new solutions for a computational implementation of RRG, and time will tell whether fuzzy logic and mathematical notions will prove a viable path forward, and also if other logical frameworks will be incorporated in future versions of the proposal. The criticism by Guest and Mairal Usón of the complexities of former solutions for logical decomposition are well taken and no doubt relevant. However, even if a final verdict on fuzziness and intervals is

not intended with this preliminary sketch of ULM, the problems mentioned do justify our attempt to look in different directions for other solutions that may retain much more of the core of RRG, yet provide it with a new lexical module.

A second and much more important consideration is that we simply cannot know how deep lexical decomposition can or should go. Right now we can only "do the best we can to extract and characterize relevant generalizations" (Jackendoff 2002: 336). And short of completely dispensing with lexical semantics in the way proposed by Construction Grammar, the main questions from an RRG point of view are still how to classify events, refine the criteria in decomposition, and figure out the interplay between semantic decomposition and discourse-pragmatic features, if we are to follow the good advice of Levin & Rapaport Hovav (2005) in their recent survey of the research in this area.

On this background the main task for us is still to devise a better framework for lexical definitions which uses current lexical and computational work on the representation of meaning, and then work this into a new tool for decomposition and mapping for RRG. Accordingly, we will first turn to WordNet, and afterwards we will focus on a Role-Lexical Module and illustrate its operation with data from the Hebrew Bible.

2.   A WordNet solution for lexical representation

In view of the need for a new solution for semantic representation within RRG and with the new probings by Faber, Mairal Usón and Guest on hold, we will now look at an alternative which offers what Jackendoff (2002: 343–345) is looking for in terms of access to a lexicon with a taxonomic structure and rules of inference. We will first suggest that we should consider the lexical definitions in the ontology of WordNet as a viable component for lexical representation. The point of departure for this proposal is that Petersen (2003, 2004) has used the database for Biblical Hebrew produced by the Werkgroep Informatica (WIVU) for some very promising research into lexical representation in WordNet and Conceptual Graphs.

The first stage of this new work used WordNet, which is a large lexical database of English developed at the Cognitive Science Laboratory at Princeton University by George A. Miller, Christina Fellbaum, and others. This database structures the lexicon as a network of meaningfully related words and concepts, and it is freely available and under constant development.[3] WordNet in many ways was developed from the original work by Sowa (1984, 2000), who formulated Conceptual Graphs (CGs) as a

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3.   There are various Web applications, a Windows version of WordNet 2.1 from March 2005, and even a Unix/Linux/Solaris/etc. version 3.0 released December 2006 (see for more details at http://wordnet.princeton.edu/). An international open corporation called Global WordNet Association encourages the development of research and cooperation and ties wordnets together from all languages in the world (http://www.globalwordnet.org/).

way to capture meaning in a logical and visual representation and in a metalanguage that both humans and computers could understand. Conceptual Graph theory produces a semantic representation from common traits of concepts and relations in the world and then clusters them into a representation of distinct types. For instance a type like *entity* will have the supertypes *person, tree, car, act, animal* and *location*. These supertypes are assemblies of subtypes, e.g., *person* has subtypes like *student* and *employer*, the supertype *act* has subtypes *go, leave, eat* and *catch*. This kind of knowledge representation is organized into a complete ontology of entities built around a top level ontology which in principle can capture all knowledge in the world. Sowa has graphically represented this in a lattice which can depict all type hierarchies according to a number of primitive distinctions.[4]

For our purpose we need not discuss all the far-reaching philosophical questions on how to grasp the structure of relation and time, since it is possible and also useful to distinguish between "Ontology as philosophical discipline" as an overarching theory of reality and the more mundane kinds of "ontology as information practice" (Øhrstrøm, Andersen & Schärfe 2005: 435). Our primary concern here is not to explore the growing collections of ontologies within knowledge engineering, but solely to introduce the seminal work carried out at the University of Aalborg. An early contribution by this group was a proposal for the analysis of narrative plot structure (Schärfe & Øhrstrøm 2000). The most recent work is carried out at the Kaj Munk Research Center (cf. http://kajmunk.hum.aau.dk/en/) and focuses on database structure and textual representation. It is this seminal work by Ulrik Petersen which inspires our proposal for a new lexical description of Biblical Hebrew. Petersen (2003) initially devised an ontology for Genesis 1–3 using a Hebrew-English dictionary and matching the English glosses with the categories in WordNet. This work was continued into a detailed proposal for a method for production of Conceptual Graphs in an "ontology-guided, syntax-driven, and rule-based joining and refinement of graphs". A reader-friendly survey of this work is now published in Petersen (2007).

It is the initial step in Petersen's new semi-automatic meaning-mapping procedure which we will pursue for our new RLM tool. The Hebrew text and a syntactic analysis is transformed into traditional syntax trees and then matched with a very simple electronic Hebrew-English/German wordlist which has now been published (Bosman et al. 2003/2004). This dictionary is automatically associated with the hierarchical linguistic types in WordNet, which contains over two hundred thousand lexical items organized into "synsets" or sets of synonyms which contain lexical items related by synonymy and related mutually by semantic relations. Synsets of nouns and verbs

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4.   See Sowa's lattice on the net (http://www.jfsowa.com/ontology/toplevel.htm; accessed September 26 2006). The lattice is "an arrangement of points or particles or objects in a regular periodic pattern in 2 or 3 dimensions" (http://www.wordreference.com/definition/lattice).

are related by hypernymy, while adverbs and adjectives are related by antonymy, similarity, and gradation. The definitions of lexemes made it possible for Petersen (2004) to produce an Abstract Syntax Tree (AST). Adjectives were translated into attributes, adverbs into manner, and Be X verbs were associated with attributes. The process turned word and phrase level rules into a single node with an attachment relation that could be used for the resulting graph. In later steps of the method, all remaining traces of Hebrew syntax were removed in order to yield the fully semantic CGs.

Petersen's initial move to produce the English glossing of each Hebrew lexeme, and his linking of these glosses with the WordNet description of meaning, looks very promising for lexical semantics in RRG. Fellbaum (1998) already inspired the original proposal in Faber & Mairal (1999) in their attempt to define the lexical domains for verbs within the framework of Functional Grammar. There is, moreover, an even closer point of contact between RRG and one particular WordNet, the EuroWordNet, which was funded by an EU grant 1996–1999 and today has merged into the global framework. The report of Vossen (2002: 57–71) explains how the European branch of WordNet relates to the very same linguistic theories that have influenced RRG. The ontology of 63 core distinctions was formulated on the basis of *Aktionsart* classes taken right out of the tradition following Dowty (1979). The qualia theory of Pustejovsky (1995) was used for categorization (Vossen 2002: 40, 59, 62–64), and was introduced into RRG at about the same time (Van Valin & LaPolla 1997: 184–186; Van Valin 2004; 2005, 50–52).

Consequently, WordNet seems to be a viable framework for lexical representation for RRG until other attempts prove themselves more productive as modules for

Figure 2. Editing WordNet.

Figure 3. Changing a WordNet definition.

integration within RRG. We have therefore decided to implement WordNet in the RLM tool. Following Petersen (2003), our tool displays the automatically generated glosses and allows the user to edit the glosses (Figure 2) and choose a more appropriate WordNet definition (Figure 3).

By clicking on a lookup button it is furthermore possible to see the category trees as displayed in www.wordreference.com (Figure 4). The WordReference site offers excellent displays of the total structure of the ontology that fits into the lexical description, making it considerably easier to look for other lexical choices and more appropriate meanings.
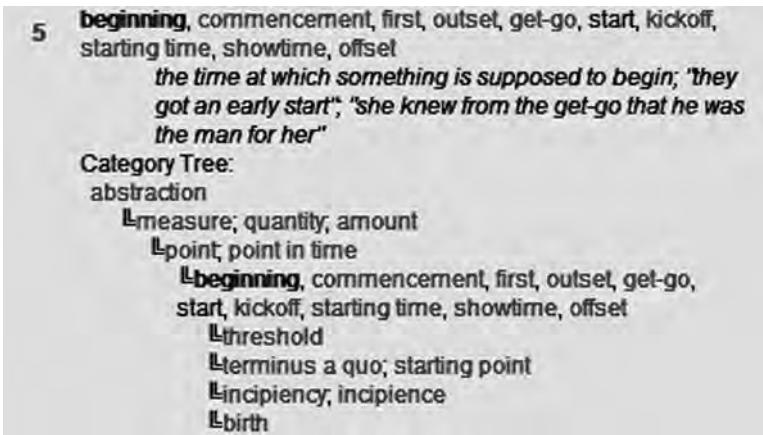
Figure 4. Category tree in Wordreference.

Figure 5. WordNet definitions for Gen 1:1.

In this way the linguist can display the precise WordNet definitions for all lexical words in the text as shown in Figure 5.

This brief presentation of an automated and interactive WordNet lexical selection tool as promised in (1a) is offered as a viable alternative to universal primes and fuzzy logical specifications of meaning. It is possible to use database technology to link WordNet definitions into RRG and use this lexical ontology as a separate tier of lexical representation on top of the syntactic and semantic structure already available in RRG. The advantage is that wordnets exist for many other languages. In the future it could be possible to link between different RRG grammars for individual languages through the lexical representations in wordnets. We have hopefully shown how WordNet could work for Hebrew RRG, and there is no reason why it should not work for other languages as well.

This means that we do have at least one feasible lexical framework which could help us as we continue to explore how RRG can be provided with a richer lexical semantics; indeed, if we choose wordnets and Conceptual Graphs theories, we will not have to reinvent the wheel but we can instead buy into well-established research traditions.

3.   Displaying and parsing the text

Our exploration of the Hebrew data by means of the RLM tool will begin by looking at the Logical Structures for *die, kill* and *murder* introduced above in (2). The most famous occurrence is found early in the Hebrew Bible in the story about Cain, the first son of Adam and Eve, who murdered his younger brother Abel. The act is narrated by the verb *wa-yya-harəgē-hū* in (9).

> (9)   a.   wa-   yya-   Ø-   harəgē-   hū
>   b.   CLM-   NARR-   Qa-   murder-   3MSG
>   'and he murdered him' (Gen 4:8)

I will first introduce the transliterated and glossed text as promised in (1b). When this clause is selected in the RLM-tool as shown by Figure 6, the first line will show the Hebrew characters and vowels from the machine-readable WIVU database but it will not show cantilations or other detailed features of the Hebrew manuscript tradition. This text is then transformed into a very simple transliteration which more or less adheres to the conventions used by linguists writing on Hebrew. A form like *wa-yya-Ø-harəgē-hū* can easily be read by linguists and it renders the data more readily available to the general non-Hebraist linguistic community. I use characters from basic symbol sets of Microsoft Windows, and therefore it will also be easier to type in searches in the database, if we make the query language from Emdros available in the RLM tool. This approach differs from the very sophisticated phonetic transliteration of Tiberian Hebrew developed by Anstey (2006), which represents the state of the art in phonology. His proposal is less useful when we just want to display a readable representation of lexical and grammatical information on the Web. Both linguists and Hebrew scholars can use the tool, and for the benefit of the latter we supply the text in Hebrew characters. The third line contains grammatical and semantic glosses. The format follows the conventions of RRG with the abbreviations from Van Valin (2005) or my own idiosyncratic choices. The conjunction is rendered as Clause Marker (CLM). For the verb form often labelled "qatal" by Hebrew Bible scholars I use Perfective (PRFV), and for "yiqtol" I use the Imperfective (IMPF). For the narrative chaining verb labelled "wayyiqtol" I use NARR in order to reflect its story-line function in Hebrew narrative.

Figure 6. The selection and presentation of the text in Lex.

My second goal is to introduce the syntactic parser anticipated in (1c). Chris Wilson has developed a parser for RLM which can help a linguist formulate parsing rules and inspect their output as in Figure 7. We are using a version for debugging the parser rules and it will therefore display all subtrees, including the failed ones. By holding the mouse over the output in the display the application will show which rules resulted in the successful parsing of the sentence, showing the top-most "node" and its projection in a highlighted colour. Furthermore, formulating experimental parser rules and observing their effect on the output "trees" is made very easy for the user. It helps us understand what kind of information it will be necessary to elicit in order to ensure an improved mapping from syntax to semantics in future versions of the RLM parser component.

Figure 7. The parsing of selection and presentation of the text in Lex.

However, one crucial problem has to be solved before we can formulate our rules for a parser which meets the syntactic requirements of RRG. We first have to choose between dependent-marking and head-marking syntactic structure (Van Valin 2005: 16–19). Dependent-marking language constructions express the arguments of the verb as independent lexical entities belonging to the core. Head-marking language constructions express the core arguments as pronominal affixes on the verb, and the example above clearly shows that Hebrew has such head-marking features in its grammar. The verb *wayyahargēhû* functions as an entire clause, and its inflectional morphemes indicate the Privileged Syntactic Argument (PSA), similar to Subject in other theories, as well as the Direct Core Argument (DCA), commonly known as Object. Hebrew should probably be classified as a dependent-marking language with some head marking features similar to languages like Latin, Polish, and Croatian. We will develop the proposal of Belloro (2004) a little further and for Hebrew propose that the verb has an obligatory agreement suffix for the PSA (AG_{PSA}), which may or may not be double marked by an explicit lexicalized NP for discourse-pragmatic reasons. Crucially, however, the suffix for the Direct Core Argument is rarely involved in the double-marking of the lexicalized NP Undergoer. We will assume as a rule that whenever the suffix for the DCA occurs it functions as a pronominalized bound morpheme for the Undergoer Argument, and we therefore label this suffix as an optional $PRON_{DCA}$. By expressing Direct Core Argument either by verbal inflection or by a lexicalized NP, but not by both, Hebrew acts as a dependent marking language would usually do (Winther-Nielsen 1995: 43–44). This example also shows that with the RLM the linguist can create truly language-specific and experimental rules which will generate a syntactic parsing based on rules created by the user.

These parsings are used for the display of a tree-like syntactic representation in the format used in RRG in Figure 8.

Parse finished with 1 possible trees. Showing the first 1:

SENTENCE				
CLAUSE				
NUC				
Pred				
V				
CONJ	V_{Stem}		AG_{PSA}	$PRON_{DCA}$
wa-	V_{TNS}	V_{STM} V_{LEX}	V_{PGN}	V_{SFX}
	yya-	Ø- harəgē-	Ø	hū

Figure 8. The tree-like output from the parser.

4. Decomposition of verbs of killing in RRG

With this knowledge of our texts and our tools we can now work our way through the evidence for the argument structure of the verb *hārag* "kill" and for other similar verb meanings in Hebrew which should be taken into consideration in a study of the logical structure of killing in the semantic representation of Hebrew. The usual meaning listed in Hebrew dictionaries for *hārag* is "kill, slay", and it occurs 155 times in the Hebrew Bible as a verbal predicate. It lexicalizes the causative senses *kill* and *murder* in the basic Hebrew stem Qal, which is the most frequent of the the the so-called "binyanim", or Hebrew verbal stems.[5] Outside the Qal stem, the verb *hārag* occurs only in the derived Qal Passive (Prov 7:26), Niphal (Lam 2:20), and Pual (Ps 44:23) stems.

In the basic stem *hārag* vividly refers to a brutal murder in its first occurrence in the story of Cain's deed (Gen 4:8.14.15.23.25) and in a number of other murder cases in Genesis (12:12; 20:4.11; 26:7; 27:41–42; 34:25–26; 37:20.26; 49:6). One semantic dictionary of Hebrew claims that the verb in some cases not only has the meaning "put a creature to death, usually by intention, but by accident is possible in some contexts (Exod 2:14)" (Swanson 1997: # 2222). However, this is hardly reflected by the discourse context in question, since Moses is portrayed as acting willfully, albeit not premeditated, when he kills the Egyptian officer. There are interesting contextual meanings associated with the use of this verb for judicial murder of innocent people in trials (Exod 23:7). Hebrew also frequently uses the verb with God as its actor (Gen 20:4. Exod 4:23; 13:15; 22:23 etc.). If we use the WordReference definition of murder as "unlawful premeditated killing of a human being by a human being" we would need to mend this definition, since on an emic view the Divine Being of the Hebrew Bible is not a human, nor does He act unlawfully.

In relation to argument structure the interesting issue is whether the RLM-tool would have to be able to handle more than actor and undergoer in the case of *hārag*. The issue is whether we can locate any core internal argument-adjuncts that need to be represented as part of the logical structure for one of the senses of this verb. We do find prepositions like *bə*- "in" (Est 9:16) and *mē* "from" (2 Sam 10:18), but they are clearly used in the partitive sense of "among" and not as a core argument. In one case *harəgû* is followed by a PP with *lə* "to" (2 Sam 3:30), and dictionaries and commentaries happily provide an interpretative meaning like "to arrange the death of someone" for the use of the preposition here and in its only other occurrence in Job 5:2. However, the question is whether one instance is sufficient evidence to prove this sense for a Non-Macrorole Argument (NMR). Further, we may note the interesting distinction in Second Samuel between Abner's responsibility for manslaughter in the case of the death of Abishai expressed by the Hiphil stem *hēmît* "cause to die" in

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5. For the Hebrew stems, see Anstey (2006: 126–127). Arad (2005: 28) rejects any relation between stems and semantic and syntactic roles.

contrast to the use of *hārag* for Joab's and Abishai's ambus of Abner in revenge for his accidental killing of their brother.

There is one particular construction we need to consider. Hebrew uses an interesting lexical specification of the instrument in expressions like *kill baḥereb* "by the sword" (Josh 13: 22) or even *ləpî-ḥareb* "by the mouth of a sword" in (10).

(10) wə- ʔet xa môr- Ø- Ø wə- ʔet šəkem- Ø- Ø
       CLM- P Hamor- MSGAB- SUFF CR- P Shechem- MSGAB- SUFF

bənō- Ø- w Ø- Ø- hārəg- ū- Ø lə- fî- Ø-
son- SGCS- SUFF PRFV- Qa- murder- 3PL- SUFF P- mouth- SGCS-

Ø xārev- Ø- Ø
SUFF sword- SGAB- SUFF

And they slew Hamor and Shechem his son with the edge of the sword

(Gen 34:26)

The PP *baḥereb* follows the verb *hārag* 12 times and precedes it 7 times in the Hebrew Bible. The interesting lexical question is whether we can justify positing a special logical structure in order to explain this particular construction as a true instrument addition with an extra argument similar to cases like *shatter something with a rock* in (5) above. If so, "let someone be killed by a sword" would have the logical structure in (11).

(11) [**do′** (w, Ø)] CAUSE [[**do′** (x, Ø)] CAUSE [BECOME **dead′** (y)]

And, alas, we do find one sole case in the Hebrew Bible where the sword stands as the implied actor in a clause. In solemn poetic and dramatic language the sword is personified as the actor of a predicate following a matrix clause where Yahweh issues a command and addresses the sword in (12).

(12) mi- ššām ʔă- Ø- cawweh- Ø- Ø ʔet ha- xerev- Ø- Ø
       P- ADV IMPF- Pi- order- 1SG- SUFF P ART- sword- SGAB- SUFF
       thence will I command the sword (Amos 9:4a)

wa- Ø- Ø- hărāg- āt- am
CLM- PRFV- Qa- kill- 3FSG- SUFF
and it shall slay them (Amos 9:4b)

However, are we prepared to let one single case from a specialized poetic segment like this one define an independent logical structure?

A second Hebrew verb *mût* "die" in the Hebrew Hiphil stem also has the meaning "kill", occuring 883 times in the Hebrew Bible. We first come across the expression *môt tamût* "you shall surely die" (Gen 2:17 and 3:17) with a peculiar emphatic verb form followed by the non-perfective conjugation. Here the verb refers to a telic terminal point at some point in the future. There is also a telic process involved when man at the time of the Flood *mētû* "they died" (7:22), and when a person *mētah* "she was dying" (35:18). The basic stem Qal for this verb is therefore associated with the logical

structure BECOME **dead′** (x) for Accomplishment (ACC). It can be debated whether contextual aspects in some instances can indicate pure state, e.g., when a character is referred to as someone who died a long time ago as in (13).

(13) wə- ʔāxi- Ø- ō Ø- Ø- mēt- Ø- Ø
CLM- brother- SGCS- SUFF PRFV- Qa- dead- 3MSG- SUFF
and his brother is dead (Gen 44:20)

However, it is more likely that the temporal reference of the Hebrew Perfective depends on contextual features in the context. The inherent temporal structure is still a telic process in the PAST, and it is therefore an Accomplishment.

The derived stem Hiphil *hēmît* is clearly used for Causative Accomplishment ([**do′** (w, Ø)] CAUSE [BECOME **dead′** (y)] in (14). We have already seen how the verb *mût* is preferred when the killing is not thought of as a brutal act in contrast to the use of the verb *hārag* for murder (2 Sam 3: 30). In (14) Reuben permits his father to slay his sons as part of an oath.

(14) ʔet šən- ēj- Ø vāna- Ø- j tā- Ø- mît- Ø- Ø
P two- dlCS- SUFF son- MPLCS- SUFF IMPF- Hi- dead- 2MSG- SUFF
Slay my two sons (Gen 42:37)

The third main verb *rācax* (*rāṣaḥ*) "kill, murder" is only used after the consti-tution was given to Israel at Sinai, and it may have a more technical and judicial sense of *commit manslaugther* or *kill* when the brutality and wilful agent is not in focus. It is most often associated with stipulations in the laws of Moses and as such the state of affair can refer to accidental death as well as governmental execution (see Swanson 1997: # 8357).

These examples illustrate the kind of linguistic analysis involved in the analysis of logical structure of a related group of verbs and how they are classified. In the fol-lowing we will give other examples to show how decomposition is handled by the RLM-tool.

5. "To see" through the LS decomposer

We will now present a case which can show the operation of the RLM tool for the Hebrew verb *see* and its RRG analysis. The relationship for lexical entries for English is shown in (15) from Van Valin (2005: 42, 66).

(15) a. *see,* **see′**(x,y)
b. *watch* **do′** (x, [**see′**(x,y)])
c. *glimpse*: SEML **see′**(Dana, picture) [formerly: INGR]
d. *show* [**do′** (w, Ø)] CAUSE [BECOME **see′**(x,y)]

The Hebrew verb *rāʔāh* "see" is used in the Hebrew Hiphil with the sense *show* in (16).

(16) Ø-   he-   rəʔāh- Ø-   Ø   ʔōt   ʔĕlōh-   îm-   Ø   gam ʔet
      PRFV-   Hi-   show-   3MSG-   SUFF   P   Elohim-   MPLAB-   SUFF   ADV   P

      zarə¿e-   Ø-   kā
      seed-   SGCS-   SUFF

God hath shewed me also thy seed.   (Gen 48:11)

The semantic representation for example (16) fits the Logical Structure of (15d). The RLM tool is tailored to help the linguist arrive at this analysis by answering a number of test questions (Van Valin 2005: 34–41). Figure 9 illustrates how the tool handles the seven syntactic and semantic tests that determine the verb class by peeling the logical features away bit by bit.

The first step is to isolate the operator-connective CAUSE because a causative verb forces us to isolate two LS components related by causation. In this case we need to ask for a causative paraphrase of *show* as "someone causes someone to see something/ someone".

Next we need to isolate any punctual elements with or without result states as in Achievements and Semelfactives. If we cannot locate any features indicating that the State of Affairs can be performed in a split second, we will need to consider the last choice for telicity and then choose Accomplishment as a verb class which during some process reaches a temporal endpoint. Now, it is clear that we can not be shown something without really reaching the point where we perceive the content stimulated by the sense impression. Arguably, from a neurological point of view, we process images in split seconds, yet in natural languages this is presumably unmarked for instantaneity and therefore is probably to be construed as a process with an end result. Accordingly, we click for Accomplishment and we have now assembled the LS components CAUSE [BECOME LS].

The last decision is to choose between activity and state. In the case of *see* there is no dynamic action involved, so state is our only option. Here the Web application will let us choose the peculiar verb-specific role of the state LS. By choosing "x perceives y", we characterize its two arguments as PERCEIVER and STIMULUS. In the case in question, the effector (x = God) does something to the effect that the causee (z) perceives the stimulus (y). The RLM tool also displays the linked logical structure in (17b).[6]

(17) a. **do′**($\langle$x$\rangle$, Ø) CAUSE BECOME **see′**($\langle$x$\rangle$:PERCEIVER, $\langle$y$\rangle$:STIMULUS)
      b. **do′**(ʔĕlōh, Ø) CAUSE BECOME **see′**(ʔōtî:PERCEIVER, zarə¿e-:STIMULUS)

This example illustrates the central task in RRG. The RLM-tool helps us classify particular verbs and map their syntactic structure onto a logical structure, and the tool allows us to perform the tests that will decide the decomposition of verb classes. This

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6.   At the present stage of programming we have not yet implemented CAUSE, so (17b) has been manually corrected for proper display.

Causativity

☑ There is a controlling agent (α CAUSE β)　　　　　**do'**(<x>, Ø) CAUSE [...]

Punctuality

☐ This must be done in an instant (punctual)

　　○ It has a result state　　　　　　　　　　　INGR

　　◉ It has **no** result state　　　　　　　　　SEMEL

Non-punctuality

☑ This must be done as a process reaching an endpoint (... in an hour) BECOME

Dynamicity (Change, Activity)

◉ This is a lasting condition (state)

○ This is something that can be done **actively** (*activity*)　　**do'**(<x>, [...])

Predicate

Endpoint (Achievement)

◉ This *activity* has no endpoint

○ This *activity* has an endpoint (*Active Achievement*)　　& INGR

　Predicate:

　Argument:　　　　　　　　　　　　　　　　　<x> ▾

Thematic Relation

<x> perceives <y> ▾		(<x>:PERCEIVER, <y>:S
<x> is		
<x> exists		
<x> is at <y>		
<x> perceives <y>	OME (<x>:PERCEIVER, <y>:STIMULUS)	Save
<x> cognizes <y>		
<x> desires <y>	COME (<x>:PERCEIVER, <y>:STIMULUS)	
<x> considers <y>		
<x> possesses <y>		
<x> experiences <y>	None	
<x> feels for <y>		
<x> has attribute <y>		
<x> has identity <y>		
<x> has value <y>		
<x> is identical to <y>	Save	

Figure 9. Logical structure test questions.

is crucial for the operation of RRG since clear test questions associate a specific verb-related thematic role with an exact argument position in logical structure. By using a program with a strict procedure for asking the right kinds of test questions, the RLM will help the linguist to discover and register the thematic relations as a function of argument positions. It all happens on the basis of non-arbitrary criteria, as claimed by Van Valin (2005: 59).

6. "To create" in Conceptual Graphs, RRG and FLM

Having seen how decomposition is carried out within an RRG analysis and with the RLM tool we will now choose the verb *create* in (18) in order to compare an analysis in Conceptual Graphs with an analysis in Logical Structure.

(18) bə- rē̆ʔšî- t- Ø Ø- Ø- bārāʔ- Ø- Ø ʔĕlōh-
      P- beginning- FSGAB- SUFF PRFV- Qa- create- 3MSG- SUFF Elohim-

      îm- Ø ʔēt ha- ššām- ajim- Ø wə- ʔēt hā- ʔārec-
      MPLAB- SUFF P ART- sky- MPLAB- SUFF CR- P ART- earth-

      Ø- Ø
      SGAB- SUFF

In the beginning God created the heaven and the earth. (Gen 1:1)

Petersen (2007) explains the logical structure of Gen 1:1 in Figure 10. The Conceptual Graph analysis specifies that there is a situation where a being, God, is an agent of create, and this being in turn has a theme which is an entity. The last line "→in→[beginning]" is to be read in the light of a rule which treats the preposition as a universal attachment type and the *in* expresses the exact kind of government of the NP (Petersen 2004: 86), i.e., it is to be read as "(attach)→[Universal]-in→[beginning]".

```
In the beginning, God created the heavens and the earth.
[Situation:
  [God]<-agnt<-[create]-
    ->thme->[entity: [heavens: {*} #]->and->[earth: #]],
    ->in->[beginning]]
```

Figure 10. Part of CGs in Genesis 1:1-3 in Petersen (2007, Fig. 4).

The logical structure analysis of Van Valin & LaPolla (1997: 111) distinguished between the lexical aspect of the Activity class and a particular group of verbs of movement, creation, and consumption belonging to the Active Accomplishment class. To the logical structure of Activity was added the logical operator *&* "and then" and the Accomplishment operator BECOME before a **be-at'**, **exist'** or **consumed'** verb. In this way, it was possible to distinguish between *John wrote poetry* in (19a) and *John wrote a poem* in (19b), and between *John drank beer* in (19c) and *John drank a beer* in (19d) in representations of the these two different meanings.

(19) a. **do′** (John, [**write′** (John, poetry)])
      b. **do′** (John, [**write′** (John, poem)]) & BECOME **exist′** (poem)
      c. **do′** (John, [**drink′** (John, beer)])
      d. **do′** (John, [**drink′** (John, beer)]) & BECOME **consumed′** (beer)

Later studies have shown that the telic part of this logical structure specifies either the arrival of the actor of the motion at a certain location or the complete

consumption of the undergoer involved. Since telicity arguably occurs only at the last punctual point in time, the Logical Structure should rather be defined as & INGR **be-at′/exist′/consumed′**. However, so far Active Accomplishment is not exchanged for Active Achievement, since the old term has achieved the status of a technical term (Van Valin 2005: 44–45). On this background it is clear that Gen 1:1 should be classified as Active Accomplishment. The LS decomposer will help us classify the Logical Structure according to the verb-specific roles which in this case are CREATOR and CREATION.

The RLM-tool at this point allows us to use the fifth and last component anticipated in (1e) and associate the selection of a logical structure with the verb classifications proposed in Faber & Mairal Usón (1999), thus making it possible to experiment with a classification of verbs according to their domains. The tool will allow us to store our Logical Structures under the domain labels suggested by the FLM definition as illustrated in Figure 11. In this particular case the WordNet definitions and the Logical Structures go very well together with the FML-solutions, but it would be very interesting to see how far the FLM, WordNet, and RLM solutions differ and when and why it occurs. However, this last component may very well prove of less value, since Faber and Mairal Usón are not actively continuing research within their original framework, and our own work is heading much more in the direction of the traditional classification of thematic roles in RRG.

Figure 11. Choice of the FLM verb domain (Faber and Mairal Usón 1999).

7.   Conclusion

This discussion of lexical representation has introduced the theoretical and technological aspects of the decomposition of meaning in RRG. We have focused on textual data from the Hebrew Bible and in this way have shown how a linguist could work within the framework of RRG in order to handle Hebrew verbs for killing, creation and seeing in RRG. Above all, we have explained the workings of the new Web application RLM for Biblical Hebrew which can map meaning from syntax to semantics as well as parse Hebrew text, thus addressing some of the most central computational tasks in RRG.

This discussion was tied into the current discussion within the RRG community about new frameworks for lexical representation. We traced recent attempts to refine Logical Structure for RRG. Furthermore, I have offered my own contribution in a partner project with my programmer Chris Wilson. My project is to develop and test new and improved methods for lexical analysis within RRG in analysis of Biblical Hebrew. My new tool will read morpho-syntactic data from the Dutch WIVU database of Hebrew and use the automated ontology-building tool developed by Ulrik Petersen of the University of Aalborg. I have argued that it is likely to be useful for RRG to take advantage of the lexical representation of WordNet, and I have shown at some length how this would work. WordNet offers RRG a common link into the dictionaries of many other languages and projects. Since at least EuroWordNet from its inception used the same kind of linguistic frameworks, we expect the WordNet ontologies to fit into RRG as an additional tier.

For Hebrew I have shown that verbs for killing can be fitted into logical structures. For Genesis 1:1, I compared the results obtained through Conceptual Graphs with results produced through Logical Structure. I introduced details from Hebrew grammar on the verb *see* to show in some detail how we can use the tool to decompose the Logical Structure of a Hebrew verb.

Manual mapping is prone to inconsistency and inefficiency for larger stretches of texts and corpora. Without computer-aided procedures we will be bogged down in quarrels over hand-coded efforts. I believe that this tool will allow us to follow clear mapping procedures and it will result in more consistent analyses and descriptions. I also plan to continue to work on all textual data for Genesis 1–3 and I hope to be able to develop data beyond these texts. The ultimate goal of our project is, however, to build a tool that will work for all languages and will use the Emdros database as a common format for data storage and tool development for RRG analysis.

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