The Syntax of Aspect

Deriving Thematic and Aspectual Interpretation

edited by

**NOMI ERTESCHIK-SHIR
AND TOVA RAPOPORT**

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The Syntax of Aspect

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we dedicate this volume to Ken Hale, beloved teacher

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General Preface

The theoretical focus of this series is on the interfaces between subcomponents of the human grammatical system and the closely related area of the interfaces between the different subdisciplines of linguistics. The notion of 'interface' has become central in grammatical theory (for instance, in Chomsky's recent Minimalist Program) and in linguistic practice: work on the interfaces between syntax and semantics, syntax and morphology, phonology and phonetics, etc. has led to a deeper understanding of particular linguistic phenomena and of the architecture of the linguistic component of the mind/brain.

The series covers interfaces between core components of grammar, including syntax/morphology, syntax/semantics, syntax/phonology, syntax/pragmatics, morphology/phonology, phonology/phonetics, phonetics/speech processing, semantics/pragmatics, intonation/discourse structure as well as issues in the way that the systems of grammar involving these interface areas are acquired and deployed in use (including language acquisition, language dysfunction, and language processing). It demonstrates, we hope, that proper understandings of particular linguistic phenomena, languages, language groups, or inter-language variations all require reference to interfaces.

The series is open to work by linguists of all theoretical persuasions and schools of thought. A main requirement is that authors should write so as to be understood by colleagues in related subfields of linguistics and by scholars in cognate disciplines.

Aspectual semantics and the syntactic structures which interface with it have come to the fore as a crucial area of concern within the larger question of how the syntax interfaces with the lexicon. Nomi Erteschik-Shir and Tova Rapoport bring together a range of papers addressing the question of how variable syntactic properties of predicates are explained in aspectual terms. Although writing from different perspectives, the authors converge on the notion of a mixed lexical-structural approach.

<div align="right">
David Adger
Hagit Borer
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Preface

This collection of articles is the outcome of our workshop on the Syntax of Aspect that was held at Ben-Gurion University of the Negev, Israel in June 2001, funded by the Israel Science Foundation. The workshop was held as part of our research project on Focus and Verbal Projection. We thank the Israel Science Foundation for the funding of both the project (Grant No. 755/97) and the Workshop (Grant No. 6020/00-01). This volume includes (updated) papers presented at the workshop as well as papers contributed by invited speakers who were unable to attend.

Our inspiration for the research project was the work of Ken Hale and Jay Keyser, to whom we dedicated the workshop. Their analysis of the syntax of argument structure, beginning with tree structure in Lexical Conceptual Structure, developed into a complex theory of verb formation and argument structure representation that relates to the aspectual interpretation of verb phrases. This view of the structural representation of argument and aspectual information has greatly influenced later research on the syntax of argument and aspect.

Our own framework continues to develop and mutate as we move further from our original inspiration, but the work of Hale and Keyser still influences us, as it does others, with its insights into both theory and data.

Notes on Contributors

Miriam Butt   is Professor of Theoretical and Computational Linguistics at the University of Konstanz. The majority of her work concentrates on South Asian languages, with a special emphasis on Urdu. She has authored, co-authored, and co-edited several books on morphosyntax, semantics, historical linguistics and computational linguistics: *Theories of Case, The Structure of Complex Predicates in Urdu, A Grammar Writer's Cookbook, Theoretical Perspectives on Word Order Issues, The Projection of Arguments, Time over Matter, Argument Realization, Nominals: Inside and Out.*
e-mail: miriam.butt@uni-konstanz.de

Edit Doron   is Associate Professor of Linguistics in the English Department of the Hebrew University of Jerusalem. She has published articles on the syntax and semantics of Modern Hebrew (such as 'V-movement and VP-ellipsis' in: *Fragments: Studies in Ellipsis and Gapping*, ed. S. Lappin and E. Benmamoun, Oxford University Press, 1999); Modern Standard Arabic ('Filling and Licensing Multiple Specifiers' with Caroline Heycock, in: *Specifiers: Minimalist Approaches*, ed. David Adger, Susan Pintzuk, Bernadette Plunkett, and George Tsoulas, Oxford University Press. 1999); Syriac ('Interface Word Order' with Shraga Assif, in: *Interface Strategies*, ed. H. Bennis and M. Everaert, Kluwer/Elsevier, 2000); and Biblical Hebrew ('VSO and Left-conjunct Agreement: Bibilical Hebrew vs. Modern Hebrew', in: *The Syntax of Verb-initial Languages*, ed. A. Carnie and E. Guilfoyle, Oxford University Press, 2000).
e-mail: edit@vms.huji.ac.il

Nomi Erteschik-Shir   is Associate Professor of Linguistics at Ben-Gurion University, Beer Sheva, Israel. Her research has concentrated on the focus–syntax interface. She is the author of *The Dynamics of Focus Structure* (Cambridge University Press, 1997) and is currently at work on a volume on the syntax–information structure interface, to be published by Oxford University Press.
e-mail: shir@bgu.ac.il

Adele E. Goldberg   is Professor of Linguistics and associated faculty in Psychology at Princeton University. She is author of *Constructions: A Construction Grammar Approach to Argument Structure* (1995) and *Constructions in Context* (forthcoming, Oxford University Press), as well as editor of *Conceptual Structure, Discourse and Language* (1996) and editor-in-chief of the journal *Cognitive Linguistics.*
e-mail: adele@princeton.edu

Jacqueline Guéron   is Professor of English Linguistics at the Université de Paris 3—Sorbonne Nouvelle. She taught linguistics at the City University of New York in 2002–3, and will teach at the University of Texas at Austin in the spring of 2005. She has worked on a variety of syntactic topics, among which are extraposition from NP, particles, and inalienable possession. With Liliane Haegeman, she published *English Grammar: A Generative Perspective* (Blackwell) in 1999. She has most recently been working on the syntax and interpretation of tense and aspect. In addition to her own articles on this subject, she has edited, with J. Lecarme, *The Syntax of Tense* (MIT Press 2004) and, with L. Tasmowski, *Tense and Point of View* (Presses de l'Université de Paris 10—Nanterre, 2003). She is now editing a volume with M. Batista, *Bare NPs in Creole Languages*, which will appear in 2005.
e-mail: gueron@ext.jussieu.fr

Ken Hale   was appointed the Ferrari P. Ward Professor of Linguistics in the Department of Linguistics and Philosophy at the Massachusetts Institute of Technology in 1981. In 1989 he was elected to the American Academy of Arts and Sciences and in the following year to the National Academy of Sciences. He was elected President of the Linguistic Society of America for the years 1994–5. Throughout his scholarly career he authored more than 130 articles, of which this is among the last. His only book, *Prolegomenon to a Theory of Lexical Argument Structure* (MIT Press, 2002), co-authored with Samuel Jay Keyser, was completed just two months before his untimely death on 8 October 2001.

Heidi Harley   is an Assistant Professor at the University of Arizona. Her research interests focus on morphology, syntax, and lexical semantics, particularly from the perspectives of Distributed Morphology and Hale and Keyser's l-syntax. Recent publications include 'A Feature-Geometric Approach to Person and Number', with Elizabeth Ritter, in *Language*, and 'Wanting, Having and Getting: A Note on Fodor and Lepore (1998)' in *Linguistic Inquiry*.
e-mail: hharley@u.Arizona.edu

Samuel Jay Keyser   is Emeritus Professor of Linguistics at the Massachusetts Institute of Technology where he currently holds the position of Special Assistant to the Chancellor. He is editor of *Linguistic Inquiry, The Linguistic Inquiry Monograph Series* and *Current Studies in Linguistics*. His most recent book in linguistics is *Prolegomenon to a Theory of Lexical Argument Structure* co-authored with the late Ken Hale (MIT Press, 2002). His most recent book of children's poetry is *The Pond God and Other Stories* (Front Street Press, 2003). Professor Keyser resides in Cambridge, MA where he plays jazz trombone and listens to Billy May records in order to remember how it is done.
e-mail: keyser@mit.edu

Beth Levin   is the William H. Bonsall Professor in the Humanities at Stanford University. She received her Ph.D. from MIT in 1983. She had major responsibility

for the MIT Lexicon Project from 1983 to 1987, taught at Northwestern University from 1987 to 1999, and was a fellow at the Center for Advanced Study in the Behavioral Sciences in 1999-2000. She is the author of *English Verb Classes and Alternations: A Preliminary Investigation* (University of Chicago Press, 1993); she also co-authored, with Malka Rappaport Hovav, *Unaccusativity: At the Syntax–Lexical Semantics Interface* (MIT Press, 1995) and co-edited with Steven Pinker *Lexical and Conceptual Semantics* (Blackwell, 1992).
e-mail: bclevin@stanford.edu

Anita Mittwoch   is Associate Professor Emeritus in Linguistics in the Department of English at the Hebrew University of Jerusalem. She has written articles in journals and books on a range of subjects, especially aspect, tense, temporal adverbials, and events in grammar. She is the main author of Chapter 8 ('The Clause: Adjuncts') of the *Cambridge Grammar of the English Language* (2002).
e-mail: msanita@mscc.huji.ac.il

Gillian Ramchand   was lecturer in General Linguistics at the University of Oxford for ten years, and is now Associate Professor at the University of Tromsö. Her work on the syntax–semantics interface has focused on the the relation between aspect and argument structure and has concentrated on the languages of Scottish Gaelic and Bengali. She has published many articles on topics such as tense, negation, and the relation between lexical meaning and syntactic representation. She is the author of a book entitled *Aspect and Predication* (OUP, 1997).
e-mail: gillian.ramchand@hum.uit.no

Tova Rapoport   is a Senior Lecturer in Linguistics at Ben-Gurion University, Beer Sheva, Israel. Her work focuses on the properties of lexical heads in syntax, particularly verbs and modifiers. She is currently writing a book with Nomi Erteschik-Shir on their theory of the lexicon–syntax interface.
e-mail: tovarap@bgu.ac.il

Malka Rappaport Hovav   is Professor in the Department of English at the Hebrew University of Jerusalem. She received her Ph.D. in linguistics from MIT in 1984 and was affiliated with the Lexicon Project of the MIT Center for Cognitive Science from 1984 to 1987. Prior to accepting the position at the Hebrew University, she taught at Bar Ilan University from 1984 to 1999. She was a fellow at the Center for Advanced Study in the Behavioral Sciences in 2002–3. She co-authored, with Beth Levin, *Unaccusativity: At the Syntax–Lexical Semantics Interface* (MIT Press, 1995).
e-mail: mhovav@mscc.huji.ac.il

Carlota S. Smith   is Centennial Professor of Linguistics at the University of Texas. She is the author of *The Parameter of Aspect* (Kluwer, 1991; 2nd edn. 1997) and *Modes of Discourse* (Cambridge University Press, 2003). Her current research is at the interface of syntax, semantics, and pragmatics.
e-mail: CarlotaSmith@mail.utexas.edu

Lisa Travis   since her 1984 Ph.D. dissertation from MIT, 'Parameters and Effects of Word Order Variation', has investigated theoretical questions in the domains of aspectual predicate classes and argument structure as well as continuing her research on theoretical explanations of word-order variation. While much of this research starts with language-specific facts of the Austronesian languages of Malagasy and Tagalog, it is done with the goal of making claims about universal principles of grammar. She is currently an Associate Professor at McGill University in Montreal.
e-mail: ltravi@po-box.mcgill.ca

Stephen Wechsler   is Associate Professor of Linguistics at the University of Texas at Austin. His first two books are *The Semantic Basis of Argument Structure* (Center for the Study of Language and Information, 1991) and *The Many Faces of Agreement*, with Larisa Zlatic, (Center for the Study of Language and Information, 2003). He is currently at work on a volume on the syntax–lexicosemantics interface, to be published by Oxford University Press.
e-mail: wechsler@mail.utexas.edu

Overview of the Volume

2 Aspect and the Syntax of Argument Structure

Ken Hale and Samuel Jay Keyser

Argument structure is here used to refer to the syntactic configuration projected by a lexical item—a verb, or a preposition, or other nuclear element. In terms of this framework three linguistic subsystems are examined: conflation, merge and obviation, and active and stative. First, it is argued, contrary to earlier positions taken by the authors, that conflation is not a movement operation after all but is to be identified with the familiar operation of selection, whereby a governing head selects for the target X° in its complement. Next, the status of root as opposed to category is examined in an attempt to show that there is an independent status for argument structure unaffected by obviative and proximate distinctions. Finally, a similar conclusion is presented with respect to argument structure and active and stative.

3 How Do Verbs Get Their Names? Denominal Verbs, Manner Incorporation, and the Ontology of Verb Roots in English

Heidi Harley

Evidence is presented showing that denominal verbs in English, of both the location/locatum variety and the unergative variety, are 'measured-out' by the incorporated nominal Root. This strongly supports the Syntactic approach of Hale and Keyser (e.g. 1993) l-syntactic approach, since it shows parallel semantic effects of identical structures in overt syntax and l-syntax, and suggests that English roots of denominal verbs have inherent semantic properties, in particular 'boundedness', which determine the effects they produce when they are Incremental Themes. The analysis presented is not obviously compatible with a functional-projection approach to Aktionsart like that of van Hout (2000*a*), Borer (1998), or Ramchand (2001).

4 Path Predicates

Nomi Erteschik-Shir and Tova Rapoport

This paper explores the connection among the various types of predicate that can describe sequential change, such as *advance*, *cool*, *march*, and *flash*. The examination is conducted within a theory of the lexicon–syntax relation in which the meanings of verbs are decomposed into atomic meaning components, each of which is free to project syntactic structure. There are three possible projected predicate types, each having a particular aspectual interpretation. The combination of the projected structure and its interpretation and a requirement of the interpretation of all verbal components allows the various predicate meanings to be derived from a verb's single lexical representation. Within this framework, the incremental and iterating change predicate types are all analysed as path, or plural, predicates and their particular syntactic and aspectual properties are accounted for.

5 Tense, Person, and Transitivity

Jacqueline Guéron

I claim that each syntactic phase of the sentence is associated with a distinct construal. In the vP phrase, all interpretation is spatial; in the TP/CP phrase, all interpretation is temporal. I replace holistic theta-roles assigned to predicates in the lexicon by fragmentary spatial or temporal event functions assigned in specific syntactic domains. I also replace transitivity between arguments by transitivity between spatial or temporal formal features of arguments. This theory of 'split interpretation' accounts for grammatically economical instances of a single lexical item receiving either a spatial or a temporal construal depending on its syntactic position. The theory is also empirically superior to theta-role theory. It accounts for the fact that arguments which never leave VP are interpreted solely in spatial terms while arguments which never occur in VP, such as the dative benefactive argument, have no spatial properties at all but only psychological properties. I show that theta-roles like Agent or Possessor are better analysed as umbrella terms for arguments which accumulate several elementary spatial or temporal functions in distinct syntactic positions. Construal mechanisms located at the syntax–semantics interface unify the fragmentary arguments and transitivity relations derived in syntax. I show how three such construal mechanisms—chain construal, A-binding, and metonymy—interact in inalienable possession and control structures.

6 Complex Aspectual Structure in Hindi/Urdu

Miriam Butt and Gillian Ramchand

In this paper, we examine two types of complex verbal predication in Hindi/Urdu and argue that the language internal diagnostics support a constructionalist view of lexical meaning. We first show empirically that these constructions must be distinguished both from genuine biclausal structures and from auxiliary-verb monoclausal structures. Secondly, we show that the semantic contribution and linear order of the components of the complex predicate can be understood under an event structure decomposition, represented syntactically in the 'first phase'. Specifically, one species of light verb will be argued to be an instantiation of a v 'initiational' l-head, while another species of light verb instantiates a 'process'-event head with the main verb providing a 'result' predicational head. If our analysis is correct, complex constructions in Hindi/Urdu are a test case which offer striking semantic evidence for an event structure decomposition of the form 'initiation$\rightarrow <$ process, result $>$', and of its syntactic reality.

7 The Aspect of Agency

Edit Doron

Verbs impose an internal structure, either temporal or thematic, on the events they describe. Whereas the temporal aspectual classification of verbs is based on the concepts of change and culmination, the thematic aspectual classification is based on the concepts of action and causality. The paper argues that the Semitic templatic morphology of verbs encodes thematic rather than temporal aspect, and presents a formal system which compositionally constructs the meaning of verbs from the meanings of their root and template. Two different types of thematic agency are expressed by Semitic templates: actor and cause, marked by the so-called intensive vs. causative templates respectively. The intensive template is a modifier of the root which classifies the event as an action, while the causative template is not a modifier, but introduces an additional cause argument. A systematic account is provided of the different projection patterns of the root's original arguments when it is combined with the causative template, based on a linguistically significant distinction which is motivated between two classes of verb: locative/experiencer subject verbs and consumption verbs.

8 Agents and Causes in Malagasy and Tagalog

Lisa Travis

In this paper, I use overt morphological alternations in Malagasy and Tagalog, two Western Malayo-Polynesian languages, to probe issues concerning aspect (telicity) and argument structure. The conclusion I draw is that the telicity markers in these two languages can license the realization of an external argument that will be interpreted as Cause, and that this argument is merged into the structure in a syntactic position asymmetrically c-commanded by the merged position of the Agent. Once this has been established, certain other conclusions can be drawn. For instance, theta-roles assigned in this manner are inherently different from theta-roles that are attached to the lexical entry of the root. Further, morpheme realization can be used to probe the argument structure of verbs that are less clear and may vary from language to language, such as verbs of cognition.

9 Event structure and morphosyntax in Navajo

Carlota Smith

Event structure in Navajo presents a challenge to generative linguistic analysis. The Navajo verb word has a complex structure with an abstract stem and prefixes that appear in fixed positions. The positions are traditionally represented by a template. The goal of this article is to determine how information about event structure is conveyed in the Navajo verb, and to consider how best to represent such structure in a linguistic account. I discuss two different approaches: that of semantically based syntax, and the surface-structure interpretation of Discourse Representation Theory. I argue that the latter is preferable on grounds of simplicity and adequacy.

10 Constructions, Lexical Semantics, and the Correspondence Principle: Accounting for Generalizations and Subregularities in the Realization of Arguments

Adele E. Goldberg

Whether particular arguments are overtly realized in languages like English is not random. A number of researchers have put forward sweeping generalizations in order to capture certain general tendencies. In this paper, however, it is argued that these analyses underestimate the role of constructions, detailed lexical semantics, and discourse factors. Given sufficient attention to these

factors, the general tendencies, as well as productive classes of systematic exceptions, follow without additional grammatical stipulation.

11 Unspecified Arguments in Episodic and Habitual Sentences

Anita Mittwoch

The omissibility of unspecified objects is for many verbs subject to contextual factors. A relatively small number of verbs allow object drop freely in episodic sentences. Many more allow it in habitual sentences. It will be argued that this is, in large part, connected to the fact that such sentences tend to have unquantized objects, and that the objects, if present, would be backgrounded.

12 Resultatives Under the 'Event–Argument Homomorphism' Model of Telicity

Stephen Wechsler

This paper presents a novel semantic analysis of the English resultative construction that crucially models telicity (aspectual boundedness) in terms of the event–argument homomorphism model (e.g. Krifka 1998) rather than the commonly assumed result state model (Dowty 1979). This assumption, together with recent insights on the semantics of scalar adjectives (Hay et al. 1999; Kennedy 1999; Kennedy and McNally 1999), leads us to an explanation for a myriad of facts. Corpus data from Boas (2000) strongly support our conclusions.

The central idea of this analysis is that resultatives involve an abstract 'path' argument corresponding to degrees along the scale denoted by the resultative predicate. This approach is broadly consonant with conclusions reached independently in other recent work. This independent evidence includes the cross-linguistic parallels between resultatives and locative paths observed by Beck and Snyder (2001), Vanden Wyngaerd's (2001) observations on Dutch and English, and Beavers' (2002) formal analysis of resultative PPs. However, comparison with those works will not be undertaken here.

13 Change-of-State Verbs: Implications for Theories of Argument Projection

Malka Rappaport Hovav and Beth Levin

Verbs showing multiple argument projection options, often with concomitant shifts in aspectual classification or assignment of the 'aspectual' roles measure or incremental theme, are ubiquitous. Their pervasiveness has given rise to two hypotheses concerning argument realization: argument expression is not

lexically determined, and only aspectual notions determine argument expression. We argue against both hypotheses through an examination of change-of-state verbs. We show that the argument expression possibilities of these verbs are determined by a non-aspectual, lexicalized property—change of state—and cannot be handled by purely aspectual non-lexical theories of argument projection. Therefore, the meaning that is lexicalized in a verb determines its grammatical and interpretive properties to a large degree, contrary to the hypothesis that argument expression is not lexically determined. Furthermore, these lexical properties do not correspond to well-known aspectual notions, contrary to the hypothesis that only aspectual notions are relevant to argument expression.

1

Introduction

NOMI ERTESCHIK-SHIR AND TOVA RAPOPORT

A verb and its arguments contribute to the interpretation of the syntactic structure in which they appear. This, to most, seems obvious, but the question is: how much? How much of variations in verbal meaning, aspectual (Aktionsart) interpretation, and thematic information are actually contributed by the syntactic structure itself? And if all this information can be derived in the syntax, what is the role of the lexical representation of the verb?

Our aim in the project that led to this volume was the construction of a theory of the lexicon–syntax connection that would address these questions. Such a theory, if along the right lines, would also offer a solution to what Pinker (1989) refers to as 'Baker's Paradox' (Baker 1979): given the non-availabililiy of negative evidence, how are the variable syntactic properties of verbs acquired?

Approaches to this issue can be roughly divided into two: the 'lexicon-driven' and the 'syntax-driven'. In the former, all of a verb's meanings are listed in the lexicon, from which the various syntactic frames are projected. Differences in both structure and interpretation are attributed to differences in meaning, or lexical representation, of a verb or verbs. In the latter, the syntax-driven approach, much of a verb's meaning is derived from the syntactic structure in which it is projected. Differences in interpretation, whether related to aspectual classification or to argument number and type, are attributable to differences in the structural representation itself. The workshop on which this collection is based set out to explore this latter option, i.e. whether the meaning of a verb, thematic information, and aspectual interpretation is determined not in the lexicon but in the syntax.

The syntax-driven approach is represented here by the bulk of the contributions. The articles offer different approaches to the manner of representation of aspectual notions like telicity, duration, cause, and change: that the information is realized in functional projections and light verb projections, that the information cannot be properly represented syntactically, and even

that information like telicity is not relevant to aspectual classification at all. The structures themselves range from the minimalist structure of Erteschik-Shir and Rapoport to the light verb structure of Hale and Keyser or Harley, to the more intricate structures such as the v-projections of Butt and Ramchand, the aspectual projections of Travis, and those containing the agency and voice heads of Doron. The structures are analysed as being in the syntax (e.g. Erteschik-Shir and Rapoport) or in the lexicon (e.g. the l-syntax of Hale and Keyser and of Harley and the first-phase syntax of Butt and Ramchand).

Goldberg's constructional approach is related to the syntactic one: under her view, particular structures have particular interpretations. In addition, this structural interpretation works hand in hand with the lexical semantics of the verb in question. The incorporation of syntactic and lexical explanations is also found in the l-syntax analyses of Hale and Keyser and of Harley and the component-projection theory of Erteschik-Shir and Rapoport.

The lexicon-driven approach is argued for here by Rappaport Hovav and Levin. Under this approach, verb meanings are made up of a constrained set of semantic elements. These elements are motivated cross-linguistically and are instantiated in languages as closed-class morphemes or light verbs (e.g. 'cause', 'go', 'be', 'have'). Lexical rules apply to these elements to derive alternations; universal Linking Rules derive syntactic structure. Wechsler's analysis of resultatives, including lexical rules and variants for different verb uses, also exemplifies a lexicon-driven approach.

A central question raised by many of these papers is the nature of the basic units from which lexical items are composed. Initially, verbs were thought to select an array of thematic roles (e.g. Gruber 1965). Since then, thematic roles have been seen as derivable from predicate decomposition (e.g. Dowty 1979; Rappaport Hovav and Levin 1998; Doron, this volume), from syntactic position (e.g. Hale and Keyser 1993, etc.; Borer 1994; 2004; Ritter and Rosen 1998; Erteschik-Shir and Rapoport 2004; this volume); and from lexical features (e.g. Reinhart 2001; Guéron, this volume). The basic units in the lexicon are thus variously analysed as predicates or light verbs like CAUSE, DO, BECOME, meaning components like Manner, Location and State, or features. The various lexical characterizations cross-cut the syntax- or lexicon-driven theoretical perspectives.

Under the syntax-driven perspective, the same structure that expresses aspectual relations also expresses argument relations, whether via particular functional projections (e.g. measure phrases or cause projections) or via the predicate type projected (e.g. the difference between the change-of-state V-A and the activity V-N). Thus there is an inextricable connection between the aspectual interpretation of a particular structure and the thematic role of that

structure's subject. The syntactic representation of aspect thus nullifies the necessity (under most approaches) of lexically specifying argument number and type.

Whereas most of the papers examine constructions in English, several offer analyses of overt aspectual morphology in other languages: this collection includes Butt and Ramchand's complex predicate analysis of Hindi/Urdu, Doron's compositional account of Hebrew verb formation, Smith's tripartite representation of Navajo aspectual morphology, and Travis's structural analysis of cause and agent in Tagalog and Malagasy.

This volume thus allows insights into the theoretical question of universal grammar and acquisition as well as the specific question of the lexicon–syntax interface and the mode of projection that such an interface involves. Theories of this interface should, and—as demonstrated by many of the papers in this collection—do, conform to syntactic principles (see Chomsky 1995; 2001). An early example of such theoretical consistency is the lexical-syntactic framework of Hale and Keyser (e.g. 1993).

Hale and Keyser's contribution to this volume further elaborates their syntactic theory of argument structure (l-syntax). Their view has inspired much work on the lexicon–syntax interface, including several papers in this volume. According to Hale and Keyser, a verb consists of a root R and a verbal host V. The root may be adjectival, requiring a VP-internal specifier, or nominal, disallowing a specifier in its verbal projection. Only VPs with specifiers license higher cause predicates. This explains why *break* (adjectival) but not *cough* (nominal) can be causativized. In this way, Hale and Keyser's approach is syntax- as well as lexicon-driven.

The division of labour between the verb and its root are as follows. The verb carries the full set of phonological features and it selects its particular R complement. The verb *dance*, for example, is 'rich enough' in semantic features to license the empty category (R) (*He danced*) as well as an overt complement (*He danced a jig*). In both cases the complement is identified as a 'dance'. Hale and Keyser predict that 'light verbs' cannot license non-overt complements, since they do not have the required semantic content.

Another non-structural property of verbs is the manner feature. Such features, linked to internal or external arguments, are also inherent in the semantics of certain roots. Manners linked to external arguments are unlicensed in the absence of that external argument—hence the ungrammaticality of *The mud smeare*d (as opposed to *The mud splashed*, which contains a verb with an internal manner feature).

The issue which Hale and Keyser address in this paper is the relationship between argument structure and aspect, in particular stativity. Their

conclusion is that aspect is orthogonal to argument structure, which is defined in terms of the structural relations of complement and specifier. They identify stativity as the property of three nuclear types: the head which defines the extended projection of A; a subclass of the category P (*in, at*); and the copula (*cost, weigh*).

Two papers in this collection are based on Hale and Keyser's research programme and, like their programme, combine lexical and syntactic properties in deriving interpretation.

Harley has the same structural analysis as Hale and Keyser, with a more detailed typology of root types. She first notes that there are two kinds of nominal root, things (*foal, drool*) and events (*hop, sleep*), each of which can either be bounded (*foal, hop*) or unbounded (*drool, sleep*). Bounded roots form telic predicates, unbounded roots form atelic predicates. In addition, certain nominal event roots select complements (*kick, push*).

A similar division accounts for the boundedness of predicates formed from both de-adjectival-state roots and denominal locatum/location predicates. A different approach is, however, suggested for denominal instrument-naming verbs such as *hammer, brush*, and *rake*. These present a problem for Harley because their inherent boundedness is not reflected in the atelic activity predicates they form. Harley proposes a language-specific process of Manner Incorporation for these verbs: the instrument manner of these roots, interpreted as an adjunct, names the verb.

For Erteschik-Shir and Rapoport, lexical and aspectual properties of syntactic structures follow from the meaning components which project and are interpreted in them. Each meaning component type (Manner, State, Location) is associated with the projection of a verbal complement of a particular category (N, A, P). While the basic inspiration clearly derives from the work of Hale and Keyser, there are major theoretical differences between the two approaches. For one example, meaning components directly project syntactic structure, rather than Hale and Keyser's having verbs defined as denominal or de-adjectival. This means that whereas a verb under the component theory may consist of two meaning components, Hale and Keyser, being limited to one root, must sometimes also specify features of a different type, such as manner, in order completely to define a verb. In addition, in the component theory the verbs themselves can merge transitive or intransitive structures. There is no need for movement to empty verbal positions, such as in the early work of Hale and Keyser (and others).

The component framework derives transitivity alternations and interpretation from the verbal components. It differs radically from lexical approaches, however, in not assuming any lexical or linking rules: syntactic projection is

free and the projected structures are what yield aspectual information, argument number, and thematic role information.

Erteschik-Shir and Rapoport characterize various types of path predicates as plurals. They thus predict which apparently telic verbs also exhibit the characteristics of atelicity, and predict too that for this same class, transitivization is always possible.

This view of path predicates is related, but not identical, to the notion of path proposed in Wechsler's contribution. Wechsler assumes the event-argument homomorphism model of Krifka (1998) (rather than the usual state model) for resultatives. In his innovative analysis, resultatives involve an abstract path argument corresponding to degrees along the scale denoted by the resultative predicate. Three classes of empirical observations follow from his analysis: (i) lexical variation with respect to the aspectual type of the verb and the scalar semantics of the resultative adjective; (ii) selection of PP vs. AP resultatives; and (iii) the generalization regarding possible resultative subjects, thus replacing the direct object restriction of Levin and Rappaport-Hovav (1995). Wechsler's generalizations are couched in terms of Head-driven Phrase Structure Grammar subcategorization frames and lexical rules, allowing him an insightful angle on the syntax–semantics interface.

Guéron develops a comprehensive, original theory of the syntax–semantics interface, which accounts for argument structure, aspect, and time. She distinguishes spatial and temporal construals of a situation, the former associated with the vP phase, the latter with the TP-CP phase; and analyses the event types Activity, Accomplishment, Achievement, and State in terms of spatial interpretation in vP and temporal interpretation in TP. She introduces an Aktionsart feature F [+/− EXT(ended)] which corresponds to an abstract number F [+/−plural] reflecting lexical content. Depending on this feature's value, a verb defines an action involving a plurality of gestures or points in space (*swim* or *sit*), or an action or state placed on a single point in space (e.g. *arrive* and *know*). Aktionsart and aspectual roles are part of the temporal construal of the sentence and, like theta-roles, do not need to be listed in the verb's lexical entry. Guéron's elegant approach is based on this basic functional feature, which has different effects in the different syntactic domains. Presumably, if her approach is in the right direction, this feature would be universal. This possibility is particularly interesting in light of the next three chapters, which show the need for a variety of different functional features, each necessary to account for specific phenomena in specific languages.

Butt and Ramchand analyse three types of complex verbal construction in Hindi/Urdu, two of which (the 'let' type and the 'result' type) are argued to be complex predicates formed on the light verbs of which they are composed.

Butt and Ramchand show that event-structure decomposition in the semantics corresponds to a particular structural articulation in terms of the aspectual projections of the categories 'causation', 'process', and 'result', for which each lexical item is specified. Lexical items associate their encyclopedic lexical content with the semantic skeleton provided by the combinatoric system. The general semantic component gives specifier positions of these three categories systematic interpretations as Initiator, Undergoer, and Resultee. Butt and Ramchand's theory of syntactic decomposition makes specific predictions concerning the types of complex predication universally possible, by defining the precise manner in which main verbs interact with light verbs.

Doron analyses Semitic (Hebrew) verbal templates and, like Butt and Ramchand, proposes a compositional account of verbal structures, in this case merging lexical roots with different agency-heads. Morphologically, these two agency-heads mark the verb with either intensive or causative morphology. The intensive agency-head is a modifier of the root. The argument of the root that it modifies is not a participant in the event, but the event itself, which it classifies as an Action. The causative agency-head merges with a fully constructed verb, introducing its own argument.

In addition, a derivation may contain one of two voice-heads: the passive or the middle. While Doron's approach is similar to that of Butt and Ramchand, the array of light verbs proposed in the two articles only partially overlaps. This raises the question as to whether the universal units into which verbs are decomposed are indeed light verbs of the types proposed in these two articles and, if so, what the universal inventory of light verbs is, and whether language-particular light verbs should be part of the theory.

Travis deals with much the same topic as Doron's in her analysis of Tagalog and Malagasy. She notes that Tagalog has two distinct morphemes, one that introduces Agents, and another (a morphological complex) that introduces Causes and non-volitional Agents. The former, she argues, is realized as the head v; one component of the latter is in Asp(ect) which is realized below vP. It follows that Causes and non-volitional Agents are generated in a syntactic position which is lower in the tree than the pure Agent position. Travis argues for a particular syntax based on morphological properties of the languages under analysis, and reaches a conclusion similar to Doron: that the various subject types are structurally distinct due to the array of verbal heads that they identify.

Smith analyses Navajo verbs, which are also morphologically complex (root/stem, classifier, and prefixes conveying lexical, adverbial, and thematic concepts). She differs from Doron and Travis in not assigning syntactic roles to the morphological constituents.

Smith employs a tripartite representation in her analysis: Event structure, Qualia structure, and Argument structure. Event structure articulates the internal structure of the situation denoted by a verb base; Qualia structure gives the particulars of that situation; and Argument structure identifies the participants in the situation. The focus of her paper is the six sub-aspectual prefixes that contribute specific aspectual meanings to a verb base. Smith discusses their aspectual meanings and interactions, and shows that surface order does not consistently reflect their semantic scope. Instead, she assumes that their surface order is, at least in part, phonologically determined.

The optional omission of objects is the topic of both Goldberg's and Mittwoch's papers. Like Hale and Keyser, they both observe that the semantic content of the verb is what licenses the omission of the object.

Goldberg argues that the role of constructions (learned pairings of form and function), detailed lexical semantics, and discourse factors together provide an account of the seemingly evasive data involved in the omission of objects. She posits a special construction, the Implicit Theme Construction, pertaining to verbs of contribution and bodily emission. The construction is motivated by semantic recoverability and politeness factors. Another construction, the Deprofiled Object Construction, is posited to account for the omission of non-focus, non-topical arguments, which are irrelevant in the discourse. These occur in a variety of cases in which the action is discoursally prominent.

Mittwoch addresses the optionality of unspecified arguments in a larger set of examples and also shows that the phenomenon is heavily context-dependent. She notes that one set of verbs that allow object omission have a manner component which, on the one hand, imbues the predicate with sufficient informational content to allow for the omission of the object and, on the other, makes the object predictable. Mittwoch's characterization of these cases is very much in line with Goldberg's Deprofiled Object Construction. Mittwoch differs from Goldberg in representing contextually back-grounded missing objects as phonologically null pro-NPs. Conditions on object omission, in her framework, would be couched as conditions on the interpretation of this proform.

Rappaport Hovav and Levin argue against purely aspectual non-lexical theories of argument projection. They, like Goldberg and Mittwoch, analyse the possibilities of object argument expression, giving ample evidence that the argument expression possibilities of change-of-state verbs appear to be determined by a non-aspectual, lexicalized property—change of state—and cannot be handled by purely aspectual theories. The data they provide challenge not only the syntax-driven approaches they argue against but also the lexicon-driven approaches, including the one they adhere to. Rappaport

Hovav and Levin believe, however, that closer scrutiny of the semantic content that defines a verb root should lead to a deeper understanding of the ways in which these roots interact with argument expression.

The papers in this volume, through an examination of various phenomena, clarify the issue of the determination of aspectual interpretation and argument (thematic) interpretation via structure. Our conclusion is that this structure, whether lexical or syntactic, whether projected by the verb root or by functional or overt morphology, can indeed yield all and more of the information that was once considered to be in the domain of the lexicon. And yet the lexicon's role is still seen to be crucial: the determination of the lexical entry that will account for (in)compatibility with syntactic structure is a vital part of any research into the syntax of aspect.

Part I

From Lexical Roots to Syntax

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2

Aspect and the Syntax of Argument Structure

KEN HALE AND SAMUEL JAY KEYSER

2.0 Introduction

The term 'argument structure' is used here to refer to the system of structural relations holding between heads (nuclei) and their arguments within the syntactic structures projected by nuclear items. That is to say, argument structure, for us, is the syntactic configuration projected by a lexical item, e.g. a verb, or a preposition, or another nuclear element.

Argument structure is determined by properties of lexical items, in particular, by the syntactic configurations in which they must appear. There are just two syntactic relations, complement and specifier, defined so as to preclude iteration and to permit only binary branching. A complement is the unique sister of a governing head, and the specifier is the sister to the first nontrivial projection of the head.

These assumptions delimit a certain project, i.e. that of ascertaining the extent to which the observed behaviour of lexical items is due to structural relations, as opposed to the interaction of structure and some other component—that is to say, to matters which we will refer to as 'questions of interface'.

We take (1) and (2) to be structurally distinct:

(1)   The pot broke.
(2)   The engine coughed.

And this structural difference accounts for their behaviour in relation to the standard causative–inchoative transitivity alternation:

(3)   I broke the pot.
(4)   *I coughed the engine.

The properties which distinguish these two verbs are the following. The verb *break*, as illustrated in (1) and (3), consists of the following structural elements, a root (R) and a verbal host (V):

(5)   R, V

The verbal component has the property that it takes a complement, realized here as the root. The latter contains the semantic and phonological features associated with the dictionary entry *break*. The root component requires a specifier, as shown in (6):

(6)

```
              V
           ／    ＼
         DP        V
       the pot   ／  ＼
               V      R
                   {break}
```
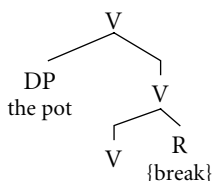
This is an essential feature of the root {R, break}, accounting for the central syntactic feature of the verb, namely the transitivity alternation observed.

The verb *cough*, represented in the grammatical sentence (2) and in the ungrammatical sentence (4), likewise consists of two parts, a root and a verbal nucleus. Unlike the root component of *break*, however, the root element of *cough* does not require a specifier, thus the verb does not, and cannot, project a specifier:

(7)

```
         V
      ／  ＼
    V      R
        cough
```
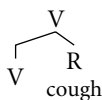
A verb, in and of itself, does not project a specifier, and its complement in this case (i.e. root element) does not motivate the projection of a specifier. These properties account for the ill-formedness of (4).

Transitivization of the type represented by (3) is in principle automatic, by virtue of the complement relation. The structure of (3) is a result of the combination, via Merge, of (6) and a verbal nucleus V, as in (8):

(8)

```
                V₁
            ／    ＼
         V₁         V₂
                 ／    ＼
               DP        V₂
             the pot   ／  ＼
                     V₂      R
                          break
```
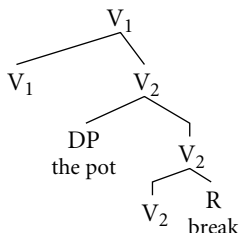
Comparable insertion of (7) into the complement position of a matrix verb is impossible—(9) cannot converge as a transitive, there being no internal argument (specifier) to be licensed by V1, assuming that to be a requirement for convergence:

(9)

$$
\begin{array}{c}
*V_1 \\
\diagup\ \ \diagdown \\
V_1 \quad V_2 \\
\diagup\ \diagdown \\
V_2 \quad R \\
\text{cough}
\end{array}
$$
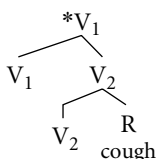
This follows from the fundamental nature of the root {cough}, which does not force the verb to project a specifier. In general, but with some exceptions, this property is shared by R elements which exist independently as the lexical heads of nominal projections, i.e. as nouns. This is in contrast to adjectives, for example, which generally do force the projection of a specifier.

While we attribute these effects to structural factors, there are other matters which must be addressed in gaining full understanding of these verbs—there is more to the grammar of verbs than structure, to be sure. We take some such non-structural factors to be matters which can be understood only in terms of one or the other interface.

Sentences (1) and (2) above are identical in 'profile', representing the canonical intransitive frame DP V. But they are not structurally isomorphic, we maintain, since their behaviour in relation to transitivization distinguishes them in a manner which implicates structure, not some other factor.

The following are also structurally distinct, despite sharing the same profile superficially:

(10)   a. He saddled a quarter horse.

      b. He made a fuss.

The difference is revealed in their behaviour in relation to the middle construction:

(11)   a.   A quarter horse saddles easily.

      b. *A fuss makes easily.

This asymmetry is due to a structural factor, we believe. A verb can participate in middle formation if and only if its complement is a dyadic projection and, consequently, contains a specifier, as exemplified in (12), the structure associated with (10a):

(12)

```
                    V
          ┌─────────┘└──┐
          V              P
                    ┌────┘└───┐
                   DP          P
              a quarter horse  ┌┘└──┐
                               P    N
                                  saddle
```
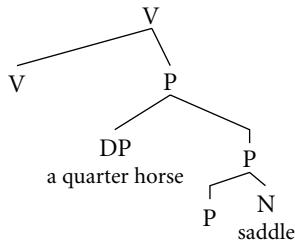
The middle construction involves a number of issues and problems, amply discussed in the literature (see e.g. Ackema and Schoorlemmer 1995; Condoravdi 1989; Fagan 1988; 1992; Kemmer 1993; Keyser and Roeper 1984; Levin 1993; Rapoport 1999). However, from the point of view of its grammatical essence, we claim that the middle simply cancels the case binding ability of the governing V, forcing the specifier to raise into the position associated with the sentential syntactic subject. This prevents the appearance there of the external subject which would otherwise combine with VP to give the transitive structure of (10a).

By contrast, the verb *make* in (10b), although it is transitive and might be expected to undergo middle formation, evidently cannot do so, at least not for us, as indicated by the judgement we have indicated for (11b). The reason, we believe, is because the structure assigned to *make* in this use fails the basic requirement. Its complement, a DP, presents no specifier (in the required sense):

(13)

```
              V
          ┌───┘└───┐
          V         DP
        make      a fuss
```
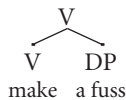
As mentioned above, a complete understanding of the middle construction will involve other linguistic components. The middle is another construction in which purely structural considerations interact with other linguistic objects and principles.

The purpose of this discussion is to examine certain cases in which argument structure, as defined above, interacts with certain other linguistic systems, including the following:

(14)   a. Conflation and Selection

        b. Merge and Obviation

        c. Active and Stative

The first of these has to do with the principles involved in the circumstance that the phonological matrix associated with the nominal root *cough* is realized in the verb of (2), and not in its complement. The second problem is semantic in nature. It has to do, among other things, with the fact that the semantic features of the root component of a verb are sometimes linked with an internal argument (object or specifier) and sometimes with the external argument (the sentential syntactic subject). The consequences are straightforward in the syntactic behaviour of the relevant verbs. The third problem involves an issue with which we have not dealt hitherto, although we have alluded several times to an opposition (i.e. central and terminal coincidence) which may be relevant. The problem will be to determine the role of structure in this domain.

2.1 Conflation and selection

Conflation is a term that we use to refer to the phonological instantiation of light verbs in denominal verb constructions. Specifically, the issue of conflation has to do with the problem of how the verb ends up carrying the phonological matrix of its nominal complement, as in examples of the type represented by (2) and (10a) above, the relevant structures for which are repeated here:

(15)

a.

```
        V
       / \
      V   R
        cough
```

b.

```
          V
         / \
        V   P
           / \
         DP    P
      a quarter horse  / \
                      P   N
                        saddle
```
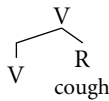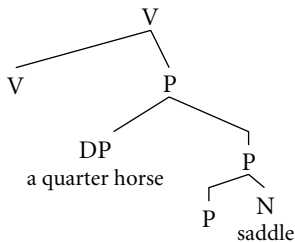
These representations give the impression that the basic structures locate the phonological matrix of the noun in the noun itself, i.e. in the complement of V in the case of (15a), of P in the case of (15b). On this view of the matter, which

we held to be self-evident for many years, the spell-out of the verb (*cough*, *saddle*, in these examples) required a kind of movement, resulting ultimately in the acquisition by the V of the phonological matrix of the relevant noun. It seemed reasonable to propose that the movement operation involved in these derivations was Incorporation, in the technical sense of Baker (1988). This idea was abandoned, however, because incorporation overgenerates, incorrectly sanctioning incorporation from the position of the internal specifier (e.g. from the position of DP in (15b)). Unconstrained, incorporation will permit forms like those in (16):

(16)   a. *They salted in the box.

             (cf. They boxed the salt.)

       b. *They tiled with grout.

             (cf. They grouted the tile.)

A properly constrained Conflation operation must be strictly local, relating a head (say V) and the head of its complement (e.g. V, P, N). The relations expressed in (15) are local in the required sense. Thus, in (15a), the noun *cough* heads the complement of V. And in (15b), there are two relevant local relations to consider. These are P and its complement *saddle*, and V and its complement P. This chain of local relations permits the Conflation of V with *saddle*. Importantly, the specifier DP in (15b) is completely 'out of the loop'.

A slightly different way to think about the structural relation which is relevant for Conflation is in terms of selection. Strict locality holds for Conflation if the governing head (V) selects the target X° in its complement. This guarantees locality and precludes Conflation of a specifier, which bears no structural relation to the governing head. In (17), the noun *box* is selected by P, and P is selected by V; but *salt* is not selected by V or any other head in (17):

(17)   They boxed salt.
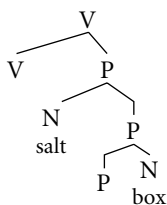
The correct structural relation for Conflation can be guaranteed in a number of ways. As just suggested, selection itself guarantees the correct structural relation—a head X° may enter into the Conflation relation with the head of its complement C if X° selects C. In (17), P conflates with *box*,

and V conflates with P. Conflation of V and *salt* is impossible. In (15a) above, V conflates with R.

What is the mechanism whereby X°, the governing head, acquires the phonological matrix implicated in the Conflation relation? This too must be properly constrained. We reject incorporation, because it is constrained by government, not selection. A possibility for the phonological realization of X° in Conflation is this. At Merge, the structure defined by X° and its complement C is assigned a label. In the simplest case, the label is determined by the head, X°. We assume that the label includes imformation about the phonological make-up of X°—i.e. a phonological matrix, an organized set of phonological features. But suppose X° has no phonological features. In that case, let us suppose that X° assumes the phonological features of its complement. This conforms perfectly to the strict locality required by Conflation. The phonological matrix *cough* is transferred to V at Merge V-R in (15a), giving (18), with overt verb and non-overt complement:

(18)
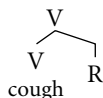
Similarly, in (17), the phonological matrix *box* is transferred to P at Merge P-N and then to V at Merge V-P, resulting in (19):

(19)
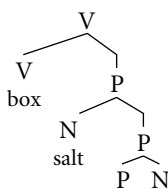
There is a problem with this conception of Conflation. Consider the following pair:

(20) a. He danced.

   b. He danced a jig.

Verbs which are candidates for Conflation appear in constructions like (20a); that is why they are candidates for Conflation. But virtually all such verbs also appear in constructions like (20b), in which the phonological matrix (*dance* in this case) must be considered in some sense 'basic'. While *dance* could be derived from the complement in (20a), it is not obvious how it could be derived from

the complement in (20b). In short, we must assume that the verb *dance* is entered as such in the lexicon, complete with its full phonological matrix. This challenges the basic foundations of Conflation as a theory of phonological realization. Except as an item of terminology, Conflation ceases to exist. The relation subsumed by this term reduces to another fully established and generally recognized relation, Selection. We have already suggested that Selection is a condition on Conflation. Suppose we carry this thought further and simply identify Conflation with Selection, folding the former into the latter. The idea would be that the full verb of (20a), for example, would be 'rich enough' in semantic features to license the empty category functioning as its complement. This is a kind of selection, inasmuch as the verb identifies the empty category as a hyponym of 'dance', i.e. a member of the class of entities which qualify as dances. This conception of the matter has the advantage that the semantic relation involved in (20a), where the complement is non-overt, is essentially the same as in (20b), where the complement is overt. The overt complement, *a jig*, is identified as a hyponym of 'dance', i.e. the jig which is a dance, as opposed to a musical score, a fiddle tune, or whatever else '*a jig*' might mean.

There is some support for this from the licensing of non-overt complements. A non-overt complement is possible if it is selected in the sense indicated, i.e. identified as a hyponym by semantic features inherent in the governing verb. It follows then that so-called 'light verbs' cannot license a non-overt complement:

(21)   a. *The builder made [N ec].

     b. *The children did [N ec].

     c. *They put the books [P ec].

In this section we have been concerned with an aspect of the interface of syntax and phonology. The problem which we began with has essentially evaporated once the licensing of null complements is properly understood as an effect of Selection. With this realization, the idea that Conflation involves incorporation, of whatever sort, from a complement into a governing P or V disappears entirely from the theory of the phonological realization of verbs like *laugh, cough, corral the horses, saddle the horses,* and the gamut of denominal verbs. The solution arrived at in this discussion has in no way impinged upon the theory of argument structure assumed here.

2.2 Merge and obviation

In the discussion just concluded, the special role of root elements is brought out. For present purposes, we maintain that a verb like *dance*, for example, has two components, (i) the categorial signature V and (ii) the root component *dance*, a core lexical item comprising the correct phonological matrix (or matrices) and the correct semantic structure. The phonological matrix determines the spelling of the verb, and we have concluded that it is inherent to the verb, not moved or incorporated from its complement. To be sure, incorporation does exist as a process in the syntax of verbal projections; verb raising is the central mechanism in the derivation of transitives (e.g. transitive *break* from unaccusative *break*) and adjective incorporation is the process involved in the derivation of de-adjectival verbs (as in *redden, thicken*). But the vast inventory of so-called denominal verbs is, so to speak, 'base-generated', in the sense that the phonological matrices of the verbs are present in the lexical entry.

In this section we consider certain aspects of the meanings of the root elements, again with the expectation that what we will find will be in the nature of some sort of interface relation between semantics and argument structure, with no fundamental effect on our conception of the latter. We have already observed one of the syntactic effects of the semantics of a root element. This is the relation which we have called Selection, following tradition. The selectional features of a root may be strong enough to impose a particular interpretation upon an overt complement (*dance a jig*), or they may be strong enough to license a non-overt complement (*dance*). Alternatively, they may be too weak to license a non-overt complement, as in the case of light verbs (*make, do, have, take*).

We will be concerned now with a somewhat different aspect of the semantics of root elements. Consider the following pair, illustrating a common transitivity alternation in English:

(22)   a. The kids splashed mud on the wall.

        b. Mud splashed on the wall.

The transitive alternant results from 'immediate gratification' of the specifier requirement of P, as shown in (23a); and the intransitive variant results by 'delayed gratification' of that requirement, as in (23b):

(23)

    a.   b.

```
          V                                 V
         / \                               / \
        V   P                            DP   V
     splash  \                          mud   / \
           DP  P                             V   P
          mud  / \                        splash  / \
              P   DP                            P   DP
             on  the wall                      on  the wall
```
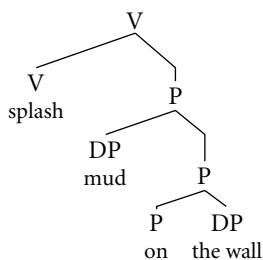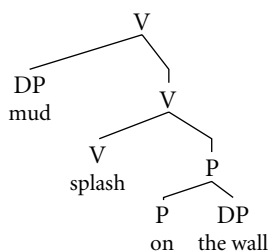
The two alternants (Hale and Keyser 2000*a*; 2000*b*) are defined straightforwardly and automatically by the operation Merge (Chomsky 1995). *Ceteris paribus*, the alternation seen here should always be available. It is not always available, of course, as shown by (24), where the intransitive alternant is ungrammatical:

(24) a. The kids smeared mud on the wall.

 b. *Mud smeared on the wall.

(25)

    a.   b.

```
          V                                *V
         / \                               / \
        V   P                            DP   V
     smear  \                           mud   / \
           DP  P                             V   P
          mud  / \                        smear  / \
              P   DP                            P   DP
             on  the wall                      on  the wall
```
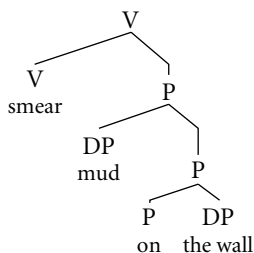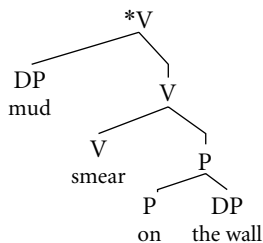
 The difference between these two verbs lies in the semantic components of their root elements. Specifically, the difference is to be found in what might be termed the 'manner factor' inherent in the semantics of the root. The verb *splash* in (22) involves a manner feature which is in a clear sense 'linked' to the internal argument *mud*. It represents the motion and dispersal of particulate matter associated with *mud*, not with the external argument. This relation is preserved in both the transitive and the intransitive alternants. By contrast, the verb *smear* in (24) is characterized by a 'manner feature' linked externally, i.e. embodying a gesture or motion associated with the external argument. This relation is, of course, disrupted in the intransitive alternant depicted in

(25b). The *smear* factor cannot be linked to the external argument there, since that position will be taken by the internal argument, raised there in sentential syntax. Accordingly, the sentence is ungrammatical (Hale and Keyser 1998).

Verbs of impact and concussion behave in a related manner; the following is a relevant pair:

(26) (a) Leecil kicked the wall.

(b) The bronc rider dented the fender.

These are assumed to have the locatum structure (cf. *give it a kick*):

(27)
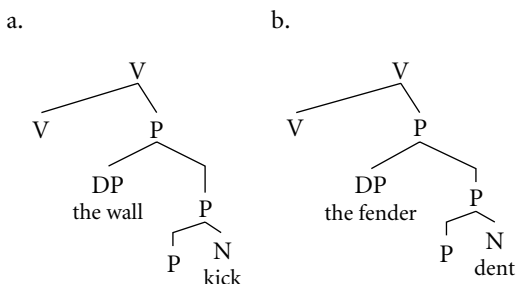
This represents an older structural representation, of course; in accordance with the previous section, the phonological matrices of the nominal roots *kick* and *dent* would appear in V, as inherent parts of the lexical entries of the verbs. The relation between the heads V-P-N is now seen as Selection, rather than Conflation as in earlier models. However, the nominal elements symbolized as N (interpreted as *kick* and *dent* here), despite being phonologically non-overt, are crucially present in the structures of (27), in the function indicated (complement of P). Their semantic properties play a role in sentential syntax, as seen in relation to the Middle Construction:

(28) a. *This wall kicks easily.

b. This fender dents easily.

The semantic properties of *kick* crucially involve a manner factor linked externally; a kick is, so to speak, a property of the entity giving the kick. For this reason, (28a) is ungrammatical. The requirement that *kick* be externally bound cannot be met there. The very nature of the Middle Construction is to eliminate the external argument. This does not affect (28b), by comparison, since the manner factor inherent in *dent* is internally bound. The internal argument is not affected syntactically by the Middle Construction, hence the required binding relation is satisfied here.

Psychological predicates also exhibit behaviour which is relevant to these observations. Consider the pair in (29):

(29)   a. *John loves easily.

      b. John angers easily.

Thus, as we might now reasonably expect, obviative (subject experiencer) predicates cannot form middles, since that operation eliminates the external argument, required to satisfy the external linking requirement of the verb's semantic factor (i.e. the semantics of *love*, an externally linked root). The proximate (object experiencer) predicate *anger* permits middle formation, since the semantic factor *anger* is internally bound.

The two types of psychological predicate display a number of well-known differences, including backwards anaphora, for example. It is possible as well that they differ in the assignment of thetic and categorical readings. Consider the sentences in (30), written to reflect the pronunciation according to which the verb bears the intonation peak, as opposed to the rendition according to which the clause receives nuclear stress:

(30)   a. The TV bóthers Bill.

      b. John respécts Bill.

It seems to us that (30a) has a thetic reading. Accordingly, it is not a standard predication construction. But (30b) is a categorical judgement, we believe. The intonation peak on the verb there is contrastive. No manipulation of the intonation causes the thetic interpretation to emerge easily. Thetic and categorical interpretations correlate with proximate (object experiencer) and obviative (subject experiencer) root semantics, suggesting that external linking is incompatible with the thetic judgement of sentences (cf. Basilico 1998).

The examples brought forth in this section are intended to exemplify a kind of interface relation between argument structure and meaning. Certain syntactic consequences follow from the appearance of roots of different semantic types, along the obviative–proximate dimension. A root like *dent*, for example, being proximate (internally bound), will permit the formation of the middle, an operation which eliminates the external argument. By contrast, a root like *kick* is obviative (externally bound), and cannot permit middle formation, since its external binding requirement cannot be met in that construction. In general, the root elements of lexical verbs involve a system of classification of this sort. But it seems to us that this does not yet touch significantly on the syntax of argument structure. In the following section we

examine a number of questions on statitivity and action which may indeed require some extension of the theory of the syntactic projection of argument structure.

2.3 Events and states

The third and final topic will concentrate on the issue of stativity and the question of its relation to structure. This section is much more speculative than the previous two, however speculative those may be. We begin with a discussion of the category 'adjective'.

Adjectives pose an immediate problem for the framework assumed in Hale and Keyser (1993; 1997). This is the case in particular for adjectival nuclei that have the fundamental property that they take just one argument—specifically, an argument which stands in the relation of specifier, not complement. The problem resides in the fact that the appropriate cooccurence of the adjective and the specifier it requires cannot be effected by Merge. The creation of a syntactic constituent by merging DP and A(djective) results in the complementation configuration, putting the DP in the wrong relation to the adjectival nucleus. What is required is a configuration in which the DP stands in a position in which the adjective will be attributed, or predicated, of the DP—a relation which can be expressed notationally by co-indexing DP and an appropriate projection of A. This is the essential adjectival requirement, and it can be satisfied in a configuration in which the DP is suitably close to the A-projection but is not a sister to the A-head. By 'suitably close' we mean that the specifier DP locally c-commands the relevant (whether maximum or intermediate) projection of the adjective and the latter is c-subjacent to the former (cf. Williams 1980).

The problem is resolved in the argument structure configurations of de-adjectival verbs like *clear, narrow, redden, darken.* These are assumed here to have a structure in which a verbal head serves not only to project the verbal category (i.e. to 'verbalize' the adjective) but also to host the specifier required by A (here a maximal projection, trivially):

(31)
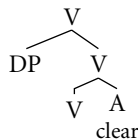
As usual, this diagram represents the properties of the heads involved. It is the 'virtual' structure, not the actual 'output'—Merge applied to V and A results immediately in Conflation, giving the verb *clear*, as in *the sky cleared* (see section 2.1 above).

But what of the adjective when it appears to lack a host for the specifier it requires? Consider the structure of an adjectival small clause of the type illustrated in (32):

(32)   a. We found [the sky clear].

      b. We consider [our students brilliant].

      c. With [the sky clear], we can fly today.

      d. With [my clothes wet], mom wouldn't let me in the house.

If *the sky* in (32a) is in a specifier position, what head projects that position? We have assumed that A itself does not merge directly with the phrase that satisfies its specifier requirement, since the resulting relation would be indistinguishable from that holding between a head and its complement, not the required relation here. And in (32) there is no other obvious candidate to host the specifier—a problem, on the face of it. The solution can be seen by considering the difference between conflation constructions like (31) and free-standing adjectival predicates like those in (32).

In the conflation construction, the adjectival component is an unprojected head—that is to say, a bare adjective. In the small clause construction, however, we assume that the free-standing adjective is the lexical head of an extended projection. In (32), it happens that no part of the extended projection is overt, since the adjective is in the absolute degree. In the examples in (33), however, elements of the extended projection are overt:

(33)   a. We found [the sky so clear that it hurt our eyes].

      b. With [the sky clearer than glass], we can fly.

      c. We found [the sky as clear as glass].

It is the functional category defining the extended projection of A, we suggest, that projects the specifier position required to complete the licensing of the adjective. This is depicted abstractly in (34):

(34)
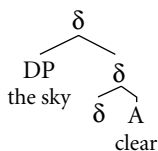
Among the elements which occur in the head position δ are Ø, the non-overt head of the absolute degree, exemplified in (32a), and *-er*, the affixal head of the comparative degree, exemplified by (33b). These both implicate conflation, eliminating the empty phonological matrices. Other members of the category δ presumably include *so, as, too, very*. The δ-projection exemplified in (34) appears as the complement of a verb in (32a, b) and as the complement of a preposition in (32c, d). In (35) it appears as the complement of raising predicates, including the copula:

(35)   a. The sky seems [*t* clear].

     b. The sky is [*t* as clear (as glass)].

     c. The sky is [*t* clearer (than glass)].

The adjective conflates with the phonologically empty head in (35a) and, in (35c), with the empty matrix associated with the comparative degree suffix *-er*.

The structures (31) and (34) share the property that they are dyadic—in both cases the head projects two 'argument positions', corresponding to the relations termed complement and specifier. There is an important difference between the two structures, a difference which resides in the nature of the head. While V and δ both select adjectival complements and DP specifiers of the same general sort (appropriate to the adjective), they differ consistently in stativity. The V-based structure is active (non-stative) and the δ-based structure is stative.

In this discussion we will be concerned in large part with the question of stativity, and with its 'source' and proper representation in the grammar. We will take a number of detours, however, in order to discuss structural matters which come up. We begin with a consideration of the possibility that stativity correlates with lexical category or part of speech.

2.3.1 *Stativity and category*

It is not unreasonable to ask whether it is a general principle that verbs project structures associated with an active (non-stative) interpretation while other categories project structures associated with a stative interpretation. In some languages this is true without exception—e.g. in Warlpiri in central Australia. But it is of course well known that in a great many other languages, including English, there are verbs which are stative according to standard tests (the progressive, imperative, telicity, etc.).

Experiencer-subject 'psych' verbs are generally classed as stative:

(36)   Experiencer-Subject Verbs (taken from Tenny, 1994:65):

   a. John feared the truth.

   b. John knew the truth.

   c. John admired the truth.

   d. John liked the truth.

   e. John respected the truth.

What accounts for the stativity of these verbs? One possibility is that they involve the dyadic structure projected by the category P—specifically, the covert P of central coincidence—like that found in locatum verbs of the type represented by *saddle, hobble, clothe.* Accordingly, these verbs would have paraphrases involving *give*, as in *John gave the truth his respect*, or, more accurately *John got the truth (to be) with his respect*, where *with* corresponds to the overt possessive preposition, a prototypical preposition of central coincidence, also illustrated in secondary predicates like *with gifts*, as in *they came with gifts.* Of course, the preposition putatively implied in (36) is empty, non-overt, and necessarily conflates with its complement. Under these assumptions, the dyadic structure underlying the verb phrases of (36) is as follows (using *respect the truth* to illustrate):

(37)
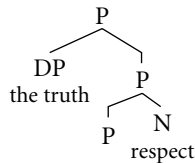
As usual, the structure depicted in (37) abstracts away from Conflation, according to which the phonological matrix of the noun *respect* is spelled out in P (see Section 1).

   If (37) is projected by a central coincidence P, we can assume it is inherently stative, like any small clause based on central coincidence P, as in *we found [him with money] (i.e. in possession of money), we found the [horse saddled].*[1] The stative uses of experiencer-subject verbs correspond structurally to certain expressions based on the structural head realized by the verb *have*, which is also stative:[2]

---

[1] James Higginbotham, in the context of a Lexicon Seminar at MIT in 1997, developed an idea compatible with the view that the ending-*ed* in derived attributes like *saddled* corresponds to the head in a dyadic projection; we take this-*ed* to belong to the category P.

[2] The correlation does not extend to all experiencer-subject verbs; many verbs cannot appear in the *have*-construction, e.g. *fear, hate, like.* We maintain, however, that these have the same basic structure as that attributed here to *respect, love*, and *esteem.* It is perhaps interesting that some nouns which enter

(38)　a. Mary has my respect. (cf. I respect Mary.)

　　b. She has the boss's esteem. (cf. The boss esteems her.)

　　c. He has his children's love. (cf. His children love him.)

　　d. Cowboys have my envy. (cf. I envy cowboys.)

　　e. Leecil has our admiration. (cf. We admire Leecil.)

The structural correlation is this, taking (38a) as the model and comparing this to (37). The subject of the *have*-construction, *Mary* in this instance, corresponds to DP in (37), and the object of *have*, i.e. *my respect*, corresponds to N, complement of P; *have* itself corresponds to P. In essence then, the predicates in (38) are structurally identical to (37). The differences between them are matters of realization and selection—(37) is headed by empty P, whose complement is a bare N, while the predicates of (38) are headed by an overt, morphologically verbal element *have*, whose complement is a full DP, specifically a possessive construction linked to the external subject.

We will resume this structural comparison at a later point. For the present, let us return to the issue of stativity. We ask whether the suggested categorial affiliation of the head of (37) could be the source of the stativity of the verb phrases of (36). This would be in line with the proposal that non-verbs head stative projections.

The usual fate of a P-headed structure like (37) is to enter into construction with another category, as when it appears as the complement of the lexically monadic V-head, as shown in (39):

(39)
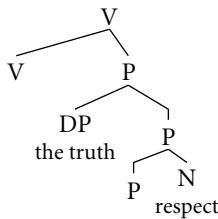
This is a verbal construction, of course, and by hypothesis should be non-stative. And we think this is true, in fact. That is to say, experiencer-subject psych-verbs like *respect, love, like, or hate* are 'ambiguous'—they can occur in the imperative and the progressive, and in contexts akin to those commonly used in typing non-stative verbs:

into the *have*-construction easily form adjectives with *-able*. And some nouns which do not enter into the *have*-construction also do not form adjectives with *-able*, e.g. **fearable* (cf. *fearsome*), ?**hateable* (cf. *hateful*).

(40) a. Respect your parents.

    b. He is liking his new job.

    c. The troops respected their new commander in minutes.

Often, to be sure, some invention must be employed to show these verbs in canonical non-stative environments, due perhaps to the fact that their characteristic, unmarked use is that of statives. But we maintain that the usage exemplified in (40) is real and must be accounted for, as it is under the assumption that these verbs can in fact enter into the construction presented in (39), essentially the structure of locatum verbs.

If the stative predicates of the *have*-constructions of (38) are structural paraphrases of (37), then the *give*-construction predicates seen in the slightly stilted (41) are structural paraphrases of (39):

(41) a. I give my respect to Mary.

    b. The boss gives her his esteem.

    c. His children give him their love.

Here again, the difference is one of realization and selection—the head is overt in (41), non-overt in (39), and the complement in (41) is a possessive DP linked to the external argument.

However, if (39) accounts for the non-stative use of experiencer-subject psych-verbs, what accounts for their allegedly more fundamental stative use, as in (36)? On the view that the stative counterparts are lexically non-verbal, there is a rather natural suggestion that can be made. The head of (37), as given, is a non-verbal head—its head is P, by hypothesis. By contrast, the head of (39) is verbal. Of course, the two are homophonous, taking the form *respect*. But this follows from the fact that both result from 'conflation' of the same bare nominal, *respect*. This gives overt phonological form to P, yielding the P-based predicator *respect*. The same nominal root gives phonological form to V in (39), deriving the verbal variant of *respect* exemplified by (40a).

If the distinction between stative and non-stative experiencer–subject predicators like *respect, love*, or *fear* can be attributed to lexical category (V, P, etc.), then the suggestion we are entertaining now could in principle be the solution to the problem of stativity—statives are P-based, non-statives are V-based. There is another part of the problem, however. The stative is just as much a 'verb' in the traditional sense, as the non-stative is. That is to say, contrary to what is expressed in (37), the stative variant of *respect* assumes the same commanding position that its V-based active homophone does. And like the latter, the stative variant enters into the same inflectional relations (e.g. tense inflections) as the non-stative, unquestionably verbal variant does.

One possibility which might be considered is that the P of (37), while not itself verbal, must inflect with verbal morphology—in violation, to be sure, of the principles which generally hold in extended projections (Grimshaw 1991). If this morphological eccentricity were in fact a property of P in (37), then its satisfaction would require P (with conflated N) to be raised to a position from which it c-commands its original position and those of its arguments. For the present, let us suppose that P raises and merges with its own maximal projection, as shown informally in (42):

(42)
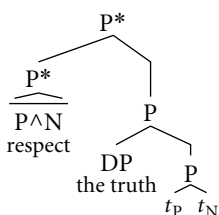
Assuming that this is a legitimate structure, it has the desired characteristics.[3] It not only brings P (P*) into its observed s-structure position, but it also places it in a position where it can assign case to the specifier DP, as required. The alternative of having P raise straightforwardly to the functional head T is, we think, not tenable, since alleged P raises in the absence of T in causative constructions of the type represented by (43a, b) and to the proximity of a functional head, without adjoining to it, as in the infinitive illustrated by (43c, d):[4]

(43)   a. That made John respect the truth.

   b. We had John learn Spanish.

   c. That'll teach John to always respect the truth.

   d. We forced John to learn Spanish.

---

[3] The structure depicted in (42) is problematic. Without some special provision, the label assigned to the upper maximal projection is ambiguous—i.e. there is no way to determine which of P' and P is the head of the upper projection. We think, however, that the problem associated with this ambiguity is spurious and that (42) is well formed.

[4] This argument depends, of course, on whether the stative variant of *respect the truth* can actually appear in the causative and in the *to*-infinitive construction of the type shown here. We assume that the complement in (43a), for example, is stative and that its telic interpretation is due to the construction; the truly active version, as in *respect your parents*, means *give your parents your respect*, not *come to respect your parents*. In (43a), the meaning is that an event, or the like, *made John come to respect the truth*, not *give the truth his respect*.

Thus, the motivation for the putative P-raising in (42) is not straightforward. It is not simply the case that P in the stative constructions at issue 'needs' verbal inflection. Rather, we think that the putative P here has the verb-like property that it must head a predication to which a 't-value' is assigned. This requires that this P, like a verb, be situated in a certain structural position—specifically, it must head a predicate and it must itself be c-subjacent to a head which sets the t-value of the predicate—e.g. T itself, assigning a 'tense' in the traditional sense; the infinitive *to*, involved in assigning a dependent or relative tense; or a causative predicator, like *make*, which likewise assigns a dependent tense to its complement (in contrast with verbs of the type represented by *expect*, which assigns no t-value, as is evident from such examples as *we expect John learn Spanish*).

This analysis purports to account for the stative readings of certain experiencer-subject verbs by attributing their stativity to the lexical category of their heads. By implication, it is imagined that the whole business of stativity might be explained in terms of category—verbs are active, non-verbs are stative, to put it simply. Before taking up this issue in more detail, we need to consider certain problems and consequences related to the basic structural relations involved in this proposal.

First, the subject of experiencer-subject verbs is evidently an external argument. Thus, verbs of the type of *respect* and *envy* cannot 'freely' transitivize (or rather, further transitivize), in the manner of verbs like *break*, *clear*:

(44)   a. *That respects John the truth. (. . . makes John respect the truth)

       b. *That envies me his talent. (. . . makes me envy his talent)

This follows straightforwardly in the verb-headed structure, (39), assigned to alleged active variants of these verbs, assuming that the verbal head is of the unmarked type for that category, i.e. the type which projects no specifier. We must assume that the same is true of the P-head in (42). But the category P is prototypically dyadic, necessarily projecting a specifier. Hence transitivization—e.g. insertion of (42) into the complement of the canonical verbal configuration—should be freely possible, leaving (44) unexplained. Persisting for the present with the idea that the head of (42) is categorially P, we appeal to the fact that the raised P (P*) is the head of a chain and hence the member of a single lexical item whose properties are satisfied in the projection initiated at the tail of the chain, i.e. at the point of first Merge. On this assumption, (42) presents no upper specifier and, hence,

cannot automatically transitivize. As in the putative active variant, so also in the stative, the experiencer-subject is an external argument.[5]

While this account is not really a satisfactory solution to the problem of transitivization, it is workable and appeals to an established principle—i.e. the uniqueness principle inherent in the theory of argument structure relations, restricting a given lexical head to at most one complement and one specifier— and it therefore accounts for the fact that (42) must lack an upper specifier.[6]

2.3.2 *True stative verbs*

To say that experiencer-subject verbs of the kind exemplified in (36) (*fear, knew, admired, liked, respected*) are stative is probably inaccurate. This is suggested both by the fact that they are open to non-stative interpretations in appropriate contexts and by the findings documented in a rich body of literature on aspect which provides copious demonstration of the fact that stativity, telicity, and the aspectual classes (activities, accomplishments, achievements) pertain not to verbs but to the predicates they head (cf. Dowty 1979; 1991; Tenny 1987; 1992*b*). It would be reasonable to entertain the possibility that these notions, and stativity in particular, are never features of individual lexical items—e.g. of verbs, nouns, adjectives, adpositions, or what have you—but rather of whole predicates.

But this does not seem altogether satisfactory either, for some heads are entirely consistent in their behaviour in relation to so-called stativity. For example, the functional head (covert or overt) defining the extended projection of the category adjective is consistently stative. Thus, while the verb phrase *turn greener* is non-stative, this is a property of the verb phrase headed by *turn*; the adjectival extended projection headed by-*er* (putative category δ) is itself 'stative' (as it is in (33b) and (35c) above), a property evidently attributable to the functional head.

The category V is not entirely left out here, since some verbs head predicates which are 'classically stative':

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[5] We have not fully explored the possibility of a Case-theoretic explanation for (44) and the like. An explanation seeking to limit structural Case to just one internal argument, for example, would have to explain the range of constructions in which two VP-internal arguments are somehow licensed without resort to adpositions or other oblique Case morphology (e.g. *I envy him his talent*). Such an explanation may well be possible, but we do not pursue it here.

[6] This is not an autonomous principle, of course, but rather an integral part of the definition of these two relations, according to which a complement is the unique sister of a head and a specifier is the unique sister of the first projection (traditionally notated X′) of the head. These notions may ultimately be shown to be wrong, linguistically fictitious, but they are fundamental to the proposals being entertained here.

(45)   a. That house costs fifty thousand dollars.

   b. This bull weighs one ton.

   c. Two and two equals/makes four.

   d. Three books constitute the entire collection.

These are stative in much the same way copular sentences with *be* are stative:

(46)   a. That house is fifty thousand dollars, if you are interested.

   b. This bull is one ton in weight.

   c. Two and two is four.

   d. These three books are the entire collection.

Furthermore, if we take the position that the verbs of (45) are in reality copulas, sharing certain essential properties with the copula *be*, then their most renowned property can be explained—namely, their failure to participate in the passive construction:[7]

(47)   a. *Fifty thousand dollars is/are cost by that house.

   b. *One ton is weighed by this bull.

   c. *Four is equalled/made by two and two.

   d. *The entire collection is constituted by three books.

   Suppose that the verbs of (45) are copulas, in fact, differing from *be* by virtue of their lexical (as opposed to functional) status and correspondingly richer semantic content, sometimes paraphrasable by means of a prepositional modifier, as in (48a, b):

(48)   a. That house is fifty thousand dollars in cost.

   b. That bull is one ton in weight.

Under this interpretation, the verbs of (45) do not select an object complement, but rather a predicate, as often pointed out in the literature on these

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   [7] An important property of the copula *be* is not shared by the semantically more contentful verbs of (31). Even in its copular function, *be* behaves like an auxiliary in relation to inversion (I-to-C raising)—e.g. *Is two and two four?*

   Some of the verbs of (45) can passivize, of course, in a different use. And (47c, d) themselves are weakly possible, using *equal* and *constitute* in senses somewhat different from those attributed to them in the suggested copular use. The well-formedness of the passive verb form in *the collection is constituted by three books* is a different issue. In general, measure phrases of the type found in (47) sound rather bad as subjects of passives—e.g., ?? *five dollars was earned by John*. This cannot account for (47), however, since in the corresponding Wh-questions, the passive is possible with *earn*, as in *how much is earned by each worker?*, while with *cost*, for example, it remains ill-formed, as in *how much is cost by that house*?

topics. Thus, while the expression *fifty thousand dollars* is a standard (plural) object DP in the passivizable (49a) below, it is a predicate in the unpassivizable (49c) (cf. (45a) and (47a) above):

(49)   a. The counterfeiter printed fifty thousand dollars.

      b. Fifty thousand dollars were printed by the counterfeiter.

      c. That house costs fifty thousand dollars.

If this suggestion is correct, then the unpassivizability of the verbs of (45) follows. The measure phrases appearing in those sentences are predicates there, albeit nominal in category; and if they are assigned case at all, it is not the accusative case ordinarily assigned by a verb but, rather, some other case, perhaps the nominative, assigned 'across the copula'. Thus, the sentences of (45) simply do not have the properties of sentences which participate in the standard active–passive voice alternation. This is consistent, incidentally, with the well-known fact that the measure phrase in (50) does not require *of*-insertion:

(50)   That house is worth (*of) fifty thousand dollars.

The lexical head which projects the clause in this case—i.e. *worth*—is nominal in category, requiring support by the auxiliary *be*, as expected. But it is syntactically a copula, and its structural complement, the measure phrase, is a predicate and not the sort of complement which is expected to be case-marked by the head that selects it. Hence, *of*-insertion (which is otherwise required, as in *the worth of her suggestion*) is not applicable.

Although the details are far from clear, it is possible that a similar analysis is appropriate to another class of verbs which fail to passivize (cf. Perlmutter and Postal 1984: 92):

(51)   a. This trailor sleeps (up to) three (gorillas).

      b. This couch seats (up to) four (people).

Here again, the complement is a measure phrase of sorts, a capacity phrase. It is possible that the proper conception of this construction is one according to which *(up to) three (gorillas)* and *(up to) four (people)* are measure predicates, as suggested for the measure phrases in the putative copular constructions of (45)—if so, the passive is expected to be inapplicable. Verbs like *hold (three gallons)* or *contain (five books)* share the property of non-passivizability with the verbs of (51), possibly for the same reason. A copular paraphrase in these cases, while generally awkward and difficult to contrive, is sometimes weakly possible, as in *this can is three gallons (in capacity)*.

Let us return to the matter of stativity, which has again drifted away as something which seems essentially beside the point. In actual fact it appears to be true, however, that the verbs in (45), in the 'copular' use we have alleged for them, are genuinely stative. The question is, then: to what is this to be attributed? It is probably true that virtually any verb can be used to denote an eventuality which is a state. But in (45) something else is going on. The verbs of (45) are stative because they are copulas, and copulas are essentially stative. Why are copulas stative, if that is so? And why is *be* in (52a) inherently stative and a legitimate copula, while *turn* in (52b) is not a copula and only derivatively stative (if at all), given that the two evidently select identical complements (here, *yellow*)?

(52)   a. The leaves are yellow.

         b. The leaves are turning/have turned yellow.

2.3.3 *Stativity as a feature relation*

If the copula is inherently stative, then it is reasonable to ask whether other syntactic heads have this property as well. The hypothetical category δ is also stative, in the generally accepted sense. So the answer is affirmative: different syntactic heads can share the property of consistently projecting a stative predicate. But is this an autonomous property? Or, as we asked in the beginning, is this a matter of category—true verbs are variable in stativity, while other categories are steadfastly stative, copulas falling outside the class of 'true verbs', despite their fully verbal extended projection?

The idea that stativity is a matter of category, pure and simple, is belied by the copula. To say that the copula—where that is understood to include verbs like *cost* and *weigh*—is not a verb flies in the face of our conventional understanding of the parts of speech of English. Thus, if stativity is a property at all, it is evidently autonomous. Consider now the behaviour of the category P, in the small-clause construction:

(53)   a. With Annan in Baghdad, we can relax.

         b. With Kirsten at Lincoln Center, ballet remains supreme.

(54)   a. *With Annan to Baghdad, we can relax.

         b. *With Kirsten from Lincoln Center, New York will boycott the ballet.

The prepositions in (53), like the putative δ in (32), project a predication which is evidently stative. At least, it is stative in the same sense that small clauses appearing in this construction generally seem to be. Verbal small clauses are clearly impossible here, as shown in (54c), though this is not in

and of itself relevant, since *all* verbs are precluded, regardless of their relation to stativity—that is, *bare* verbs are precluded, not gerunds, which are stative and therefore allowed. It is trivially true, therefore, that eventive predicates projected by bare verbs are precluded in the *with*-construction.

The category P, however, is not uniform in relation to this construction. Those in (53) project small clauses which are perfectly possible there, while those in (54a, b) do not. Some prepositions, e.g., *in* and *on*, are permitted on one reading, but not on another:

(55)   a. With Father Jim in the room, we have to watch our language.

          (≠ With Father Jim entering the room, …)

       b. With Clint on his horse, all's right with the world.

          (≠ With Clint getting on his horse, …)

The plain prepositions *in* and *on* can express a relation in which the argument in Specifier position (i.e. derived s-structure subject) corresponds to an entity which moves or is arrayed along a path ending at the place denoted by the complement, like the related prepositions *into* and *onto*:

(56)   a. Frankie walked in(to) the room.

       b. Clint got on(to) his horse.

But this is not the reading which comes through in the *with*-construction exemplified in (55). Instead, in those examples the understanding is that the location of the entity denoted by the Specifier in the P-projection coincides in a certain sense with the place denoted by the complement.

The opposition which emerges in (53) and (54) is one which appears to be rather pervasive in the lexical and functional systems of the grammars of natural languages. It is probably to be identified with the well-known telicity opposition, and with the central and terminal 'coincidence' opposition to which we have referred on occasion (cf. Hale 1986). The prepositions of (53) project the dyadic structure characteristic of the lexical category P:

(57)
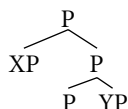
The prepositions which project dyadic structures compatible with the *with*-construction of (53) share the property of expressing the relation of 'central coincidence', holding between the figure (specifier) and the place

(complement). Those which cannot appear in that construction are identified with the relation we have labelled 'terminal coincidence'. The various manifestations of this fundamental opposition are, of course, well known by a variety of names, including 'stasis' and 'change'. We employ the terminology of 'coincidence' here to reflect the dyadic nature of the relations. In any event, we suspect that this opposition is a true reflection of inherent properties—relevant to the notion traditionally referred to as 'stativity'—in certain lexical and functional heads which project dyadic structures in syntax. Central coincidence consistently corresponds to stativity. Terminal coincidence, on the other hand, corresponds to change and therefore to the various active, dynamic, and otherwise non-stative event types.

If participation in the coincidence opposition is indeed a fundamental property of certain syntactic heads, and if stativity is identified with central coincidence, then it is very probable that this identification is the *only* way in which stativity is attributable to a *head*, as opposed to a *construction* (as in structures projected by the experience-subject verbs of (36), for example).

Let us assume that this is correct. Then which categories participate in the opposition? In particular, which heads are associated with central coincidence and, to that extent, with stativity?

We have suggested three nuclear types which are inherently stative in this sense: (i) the head which defines the extended projection of A, i.e. the category δ (as in (32, 33) above); (ii) a subclass of the category P, e.g. *in*, *at*, as in (53a, b); (iii) the copula, morphologically a subclass of V, e.g. *cost*, *weigh*, as in (45).

The first of these can be illustrated by means of the small clause in (32a), repeated here as (58), with structural representation in (59):

(58)   We found [the sky clear].

(59)

$$
\begin{array}{c}
\delta \\
\diagup\diagdown \\
\text{DP} \qquad \delta \\
\text{the sky} \quad \diagup\diagdown \\
\delta \quad \text{A} \\
\qquad \text{clear}
\end{array}
$$
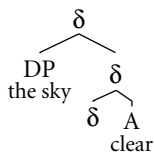
This is claimed to involve 'central coincidence' because its specifier, *the sky*, corresponds to an entity which possesses the attribute denoted by the complement, i.e. the adjective phrase *clear*. That is to say, the relation between the specifier and the complement is not one of change. The entity denoted by

the specifier possesses the attribute. It does not come to have the attribute, or come to lack the attribute; rather, the entity and the attribute coincide to define a set whose members are at once *the sky* and *clear*. Contrast (59) with (61) below, corresponding to the inchoative, i.e. terminal coincidence, hence nonstative, (60):

(60)   The sky cleared.

(61)

```
          V
        /   \
     DP       V
   the sky   /  \
           V      A
                clear
```
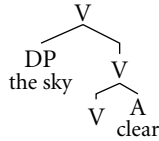
The dyadic head V, like the majority of verbs, has the property of projecting a structure expressing the terminal coincidence relation. The entity denoted by the specifier undergoes a change whose end-point is possession of the attribute denoted by the complement.

Central coincidence prepositions, like *in* in (53a), repeated here as (62), project a wide variety of structures showing a correspondingly wide range of interpretations. In this case, the preposition is used to express its customary locational sense and function:

(62)   With [Annan in Baghdad], we can relax.

(63)

```
          P
        /   \
     DP       P
    Annan    /  \
           P      NP
           in   Baghdad
```
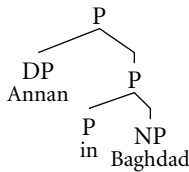
The entity denoted by the specifier, *Annan*, coincides with the location denoted by the complement, *Baghdad*. Here again, no change is expressed in the small clause. Rather, the preposition identifies the location of the entity denoted by the specifier with the place denoted by the complement— the two locations coincide centrally, not terminally, insofar as that is physically possible. By contrast, in *they led Annan into Baghdad*, the preposition expresses terminal coincidence (the place, Baghdad, being the *terminus ad quem*).

Turning now to the stative copula, we believe that central coincidence is what defines that category of verbs. In a predication of the type represented by

(64), employing the prototypical copula *be*, the property denoted by the syntactic complement, i.e. the predicate nominal *a calf roper*, is attributed to the entity denoted by the subject:

(64)   Leecil is a calf roper.

This is central coincidence—the property (*a calf roper*) coincides temporally and spatially with the entity (*Leecil*). In this respect, the copula *be* contrasts minimally with the nonstative, terminal coincidence *become*, which likewise relates a subject and a predicate and, to that extent, is a copula:

(65)   Leecil became a calf roper.

In this case, the predicate nominal denotes a property which corresponds to the end-point of a change undergone by the entity denoted by the subject— a relation comparable to that in (60) above, and unlike that in (62), which is to be compared rather with (64). The verbs *be* and *become*, in (64) and (65), constitute a minimal pair, so to speak, for the central vs. terminal coincidence opposition.

Our conclusion about stativity is that it is not itself a feature of heads. Rather, it is a property of constructions and arises in the semantic composition of meaningful elements. However, among the elements which contribute to a stative semantics is an element which is attributable to syntactic heads. This is the semantic opposition just discussed, i.e. coincidence. Some heads must be identified with central coincidence. Among these are some verbs. The stative copulas (e.g. *be, cost, weigh, equal*) are clearly members of this class. We leave open the question of how widely central coincidence is distributed among the rest of the verbal lexicon.

2.3.4 *Stativity as a structural relation*

The suggestion of the previous section is that there is a property of syntactic heads, specifically the central value in the coincidence dimension, which is responsible for the stative interpretation of certain predicates. That is to say, central coincidence is the origin of stativity, in some cases at least. Let us assume that this is so, for the sake of argument. The question then becomes, what is the nature of this element. Is it a feature, say [central], with values plus and minus, or is there something else going on? It is hard to imagine this as a feature opposition, in the traditional sense, i.e. as the presence or absence of some property. Suppose the feature is [central]; absence of a property 'central' does not really make sense. If the feature is [terminal], then 'minus

terminal' makes some sense (i.e. absence of movement to or from an end-point) but only in relation to some other element, i.e. a place (path or ground). The latter is fundamental. Thus, the simplest 'events' involve a place. If a terminal relation is involved, it is in addition to the place. Thus what we have called 'terminal coincidence' is more complex than 'central coincidence'. If this relative complexity were expressed in structure, then central coincidence would involve a simple dyadic structure, like that defined by the projection of the preposition *in*, as in the bracketed small clause of (66) for example:

(66)   With [the baby in bed] we can relax.

(67)
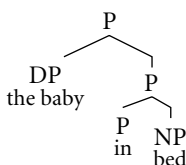
By contrast, the terminal coincidence preposition *into* implicates a complex structure (as suggested, in this case, by the form of the preposition itself; cf. Jackendoff 1983).

(68)   Getting [the baby into bed] is hard.

(69)
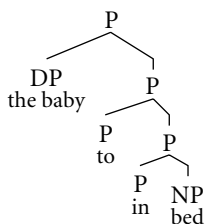
   Some lexical items are characterized by the appearance in them of P-projections belonging to one or the other of these two types. The pair (70) exemplifies intransitive verbs belonging to the central coincidence and terminal concidence categories, respectively:

(70)   a. Leecil stayed in Tucson.

       b. Leecil went to Tucson.

The structural representations of these sentences are as follows:

(71)   a.   b.

```
         V                              V
        / \                            / \
      DP   V                         DP   V
    Leecil / \                     Leecil / \
          V   P                          V   P
        stay / \                        go  / \
            P   N                          P   P
           in Tucson                      to / \
                                            P   N
                                          (at) Tucson
```
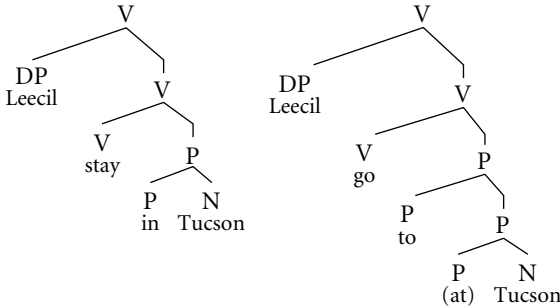
The verbs *stay* and *go* select the P-projections indicated. They are not them-selves central or terminal coincidence. That property derives from the P-projections. Accordingly, the verbs are not necessarily stative. Any stativity which might adhere to these sentences is due to the P-projections, and it correlates with the central and terminal coincidence distinction inherent in the configurations. The simple P-projection (as in (71a)) corresponds to central coincidence, and the more complex structure (P within P, as in (71b)) corresponds to terminal coincidence.

Transitive counterparts to (70) are illustrated in (72) and (73):

(72)   a. We keep the calves in the corral.

        b. We put the calves in the corral.

(73)   a.   b.

```
         V                              V
        / \                            / \
      V    P                         V    V
    keep  / \                      put   / \
        DN   P                         DP   P
    the calves / \               the calves / \
              P   DP                       P   P
             in  the corral               to / \
                                            P   DP
                                          (in) the corral
```
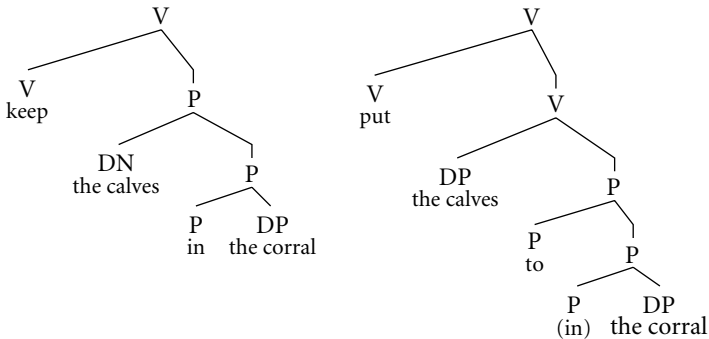
With these examples we claim that a genuine opposition exists between two kinds of verb, depending on the type of P-projection which appears in their lexical structures. Central coincidence verbs are those built upon a simple

P-projection. By contrast, terminal coincidence verbs are built upon complex P-projections; they contain a P-projection consisting of a P which takes a second P as its complement.

2.4 Concluding remarks and observations

What is the relationship between aspect and argument structure? The question makes sense, of course, if the terms are defined. We define argument structure as the system of structural relations holding between lexical heads (nuclei) and their arguments within the syntactic structures projected by nuclear items.

Our conclusion, in general, is that aspect is orthogonal to argument structure. Whenever we deal with questions of interface and interaction in this domain, we observe that argument structure is for the most part autonomous. Its properties and characteristics are strictly local, being defined in terms of the structural relations of complement and specifier. To be sure, any argument structure configuration associated with an actual predicate in sentential syntax will be interpreted in terms of one or another aspectual type (achievement, accomplishment, etc.) and its arguments will be associated with one or another aspectual role (measure, path, terminus, etc. (Tenny 1994)). But argument structure is a distinct and separate component of grammar.

3

How Do Verbs Get Their Names? Denominal verbs, Manner Incorporation, and the Ontology of Verb Roots in English

HEIDI HARLEY

3.1 Introduction: Re-sorting aspectual classes

Discussions of Aktionsart and verb class generally distinguish three types of eventive VP: Incremental Theme verbs, such as *eat, draw, write,* and *destroy,* Change-of-State verbs, such as *open, clear,* and *flatten,* and other unergative and transitive verbs, including activities, semelfactives, and some others, such as *run, drool,* and *push.* Since both Incremental Theme and Change-of-State verbs are usually accomplishments, and both may exhibit Tenny's (1992*a*) measuring-out effect with internal arguments, they have usually been treated as a natural class. This chapter shows that at least a certain subset of the third class—zero-derived denominal verbs—should also be treated as members of the Incremental Theme or Change-of-State classes.

   On the l-syntactic approach of Hale and Keyser (e.g. 1993), the position of the nominal that forms the Root of the denominal verb, prior to incorporation, is identical to the position of certain unincorporated measuring-out arguments. Such roots may differ in properties that bear on measuring-out, such as inherent boundedness. Consequently, we expect that different denominal verbs will have different Aktionsart properties, and that such properties will be reliably determined by the meanings of their roots, in the same way that such properties affect the Aktionsart of VP predicates with

unincorporated measuring-out arguments. This turns out to be the case. On this analysis, however, we must assume that there are two crucially different types of denominal verb in English: verbs whose names are derived via incorporation of a Root from within the argument structure, producing the measuring-out effect, and verbs whose names are derived some other way, by a mysterious, parametrically varying, ill-understood process which I shall call 'Manner Incorporation'.

3.2 Background

Much recent work on telicity has turned on the important connection between the direct object position and the telicity of the VP, as discussed in Verkuyl (1972), Dowty (1979; 1991), and Tenny (1992*a*), among many others. The central observation is that in many VPs, the boundedness of the direct object determines the telicity of the event denoted by the whole VP complex, as illustrated by the *for/in* temporal adverbial tests in (1) (Vendler 1957). A proposal that has gained substantial currency is that there is a functional projection which checks the boundedness features of the direct object to provide an aspectual interpretation for the VP (e.g. Borer 1998; 2002; van Hout 1996). This projection is sometimes conflated with the accusative case-checking projection, sometimes independent of it.

(1) a. Sue drank/wrote   for hours/#in five minutes.

      b. Sue drank a pint of beer/wrote a story   #for hours/in five minutes.

      c. Sue drank beer/wrote stories   for hours/#in five minutes.

      d. Sue wrote at a story   for hours/#in five minutes

Other authors have called into question the importance of the direct object as a determiner of telicity, notably Jackendoff (1991; 1996) and Levin (2000). There are verbs which take an overt, bounded, definite direct object and are yet inherently atelic (2a, c); they become telic when a goal argument is provided (2b, d).

(2) a. Sue pushed the cart   for an hour/#in an hour.

      b. Sue pushed the cart to the field   #for an hour/in an hour.

      c. Sue kicked the ball   for an hour/#in an hour.

      d. Sue kicked the ball to the centre   #for a second/in a second.

There is a similar set of unergative verbs of motion: they are essentially atelic, as is expected since they do not have a direct object, but they may

become telic with the addition of a goal PP (still without a direct object), illustrated in (3).

(3) a. Sue danced   for an hour/#in an hour.
     b. Sue danced across the stage #for five minutes/in five minutes.
     c. Sue hopped   for an hour/#in an hour.
     d. Sue hopped across the stage #for five minute/in five minutes.

A third class of verbs of motion may be transitive as well as intransitive, but do not become telic until a goal PP is added:

(4) a. Sue walked   for an hour/#in an hour.
     b. Sue walked the dog   for an hour/#in an hour.
     c. Sue walked (the dog) to the park   #for five minutes/in five minutes.

With respect to verbs of motion, when motion appears to be spontaneous or internally caused, there is a well-known connection between tests for unaccusativity (*there*-insertion (5), and auxiliary selection (6)) and the presence of a goal PP, implying a connection between telicity and the object position:

(5) *There*-insertion
     a. The bullet whistled as it passed my ear.
     b. *There whistled a bullet (as it passed my ear).
     c. There whistled a bullet past my ear.

(6) Auxiliary selection in Dutch (Borer 1998)
     a. Jan **heeft/*is**   gesprongen.
        Jan has/*is   jumped
        'Jan has jumped.'
     b. Jan **is** in de sloot   gesprongen.
        Jan is in the ditch   jumped
        'Jan has jumped into the ditch.'   where *in de sloot* is a Goal,
                                              not a Location
     c. Jan **heeft**   in de sloot   gesprongen.
        Jan has   in the ditch   jumped
        'Jan has jumped (while) in the ditch.'   where *in de sloot* is a
                                                 Location, not a Goal

This would seem to support a necessary connection between presence of an internal argument and telicity, as predicted by measuring-out treatments, but

it is clear that it is the structural effect of the Goal PP, rather than the telicity it can provide, that is relevant for the unaccusativity tests. Consider the Italian examples in (7):

(7) a. Gianni è corso   verso   il bosco.
       Gianni is run   towards   the woods.
       'Gianni ran towards the woods.'

   b. Gianni è scivolato   in direzione   della pianta.
       Gianni is slid   in the direction   of the tree.
       'Gianni slid in the direction of the tree.'

Although the unaccusative auxiliary selection (*è* 'is', as in the Dutch example in (6)) indicates that the additional PP has indeed licensed an internal argument, the PP in question in these examples does not provide an end-point, and the entire VP is atelic. Similarly, atelic PPs like *towards* and *around* license causatives of manner-of-motion verbs in English, despite the atelicity of the entire event, as shown in (8):

(8) a. John waltzed Matilda around and around the room for hours.
   b. John walked Mary along the river all afternoon.

Facts like these show that there is no necessary connection between the presence of the internal argument and telicity here. For a discussion of this class of verbs and its implications for treatments of Aktionsart, see Folli and Harley (2003).

   A third class of atelic activity/semelfactive verbs with objects become telic only with the addition of a result phrase (Rappaport Hovav and Levin 1998):

(9) a. Sue hammered the metal   for five minutes/#in five minutes.
   b. Sue hammered the metal flat   #for five minutes/in five minutes.
   c. #This metal hammers easily.
   d. This metal hammers flat easily.

Again, the presence of the internal argument is not the crucial factor in determining the Aktionsart of the VP, for these verbs.

   Most theorists have ascribed the distinction between Incremental Theme verbs and the verbs discussed above to an idiosyncratic property of the verbs themselves. For example, van Hout (2000*a*) says of these verbs, 'Following Dowty, Tenny, Krifka and Verkuyl, I take it that it is a lexical property of verbs that distinguishes the *push*-class from verbs like *drink* and *write*.' Here, I show that these two apparently distinct classes of verb can be treated in a uniform

way, assuming an l-syntactic approach. There is an important connection between the 'object' position and measuring-out, as well as other argument positions which can also produce a measuring-out effect. The crucial claim here is that in all cases the influence of the measuring-out argument is exerted from its base-generated position, and hence can even be seen in cases where the measuring-out argument is incorporated into the verb. A corollary of the central claim, then, is that the measuring-out argument cannot be exerting its influence from the specifier of a telicity-checking functional projection. The overall view here is thus very much in the spirit of Hale and Keyser's conclusion in this volume, that '[inner] aspect is orthogonal to argument structure'. It is the interaction of the meanings of their constituents and their syntactic argument structure which determines the Aktionsart properties of predicates; it is not the Aktionsart properties of predicates which determine their argument structure.

3.3 L-syntax and Measuring-Out

To begin to make the argument for such an approach, let us first consider a class of unergative verbs that, unusually for such verbs, denote Accomplishments. These are Hale and Keyser's denominal verbs of birthing, illustrated in (10).

(10)   a. The mare foaled   #for two hours/in two hours.

     b. The dog whelped   #for two hours/in two hours.

     c. The cow calved   #for two hours/in two hours.

Hale and Keyser (e.g. 1993) propose that these verbs (as well as unergative verbs in general) are essentially transitive, derived by incorporating a noun root in object position into the transitive 'light' verb that selects it—i.e. by conflating a transitive structure. The l-syntax of a verb like *foal* is illustrated in (11):

(11) L-syntax for unergative verbs of birthing[1]:
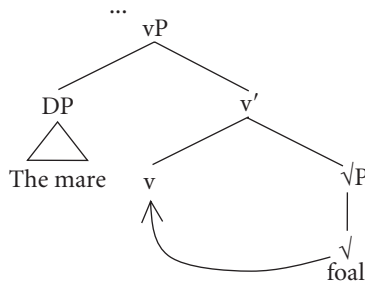
'The mare foaled.'

[1] Here and elsewhere in the paper the TP/CP functional superstructure is omitted from tree diagrams since it is not immediately germane to the point at hand; I assume, however, that any fully inflected sentence like 'The mare foaled' contains a full complement of such functional structure.

This treatment of *foal* as having an underlying direct object, which incorporates into the transitive verb, is inspired by the more or less equivalent transitive paraphrases: *The mare had a foal, The mare bore a foal*, etc. The transitive paraphrase is telic, as illustrated in (12), and it seems natural to think of the object in the paraphrase as an Incremental Theme, measuring-out the event of birthing via an event–object homomorphism in the sense of Krifka (1998).

(12)   The mare bore a foal   in two hours/#for two hours.

If Hale and Keyser are right about the structure of denominal verbs of birthing, then the root √*foal*, underlyingly in object position, should measure-out the event of *foaling*. Consequently, the Aktionsart properties of *bear a foal* should be similar to the properties of *foal*, at least if the Root √*foal* is itself inherently delimited, which seems plausible. In fact, the verb *foal* does have the same telicity as *bear a foal* (13):

(13)   The mare foaled   in two hours/#for two hours.

One data point does not a generalization make, however. To confirm that the Root is measuring-out in the same way that an overt direct object does, we need to contrast these unergative verbs (having delimited incorporated Roots) with some which have inherently non-delimited Roots, which should produce an atelic unergative verb. A good candidate for an inherently non-delimited nominal Root is a mass noun, like *water*. There are a few such mass nouns which are the basis for unergative denominal verbs in English. These are verbs of bodily emission of fluids (as opposed to babies), such as *drool, sweat,* and *bleed*, where the mass Roots on which the verbs are based start out in object position and then are incorporated, employing exactly the same structure as for *foal* in (11) above. As the l-syntax analysis predicts, the unergative verbs which result from incorporating a mass noun from object position are atelic, illustrated in (14), in exactly the same way that their transitive paraphrases in (15) are.

(14) a. The baby drooled   for two hours/#in two hours.
       b. The athlete sweated   for two hours/#in two minutes.
       c. The wound bled   for two minutes/#in two minutes.

(15) a. The baby made drool   for two hours/#in two hours.
       b. The athlete made sweat   for two hours/#in two hours.
       c. The wound oozed/made blood   for two minutes/#in two minutes.

If the denominal verbs in (14) have the structure illustrated in (16) below, and if the Roots √*drool*, √*sweat*, and √*bleed* are inherently non-delimited, then

again, the correspondence in Aktionsart between the transitive paraphrases and the unergative verbs is predicted by the l-syntactic approach.[2]

(16)   L-syntax for unergative verbs of bodily emission of fluids

...

'The baby drooled'
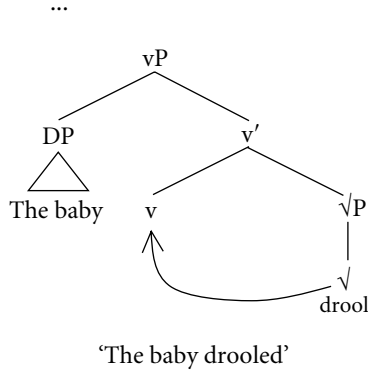
There is even one verb of birthing with a non-delimited nominal Root, pointed out by Paul Kiparsky: *spawn*. This verb forms a minimal pair with the other verbs of birthing: it produces a (potentially) atelic birthing event, in contrast to those with delimited nominal Roots like *foal* above:[3]

(17)   The female salmon spawned for thirty minutes.

To sum up the observations of this section: in the paraphrases in (12) and (15), we attribute telicity or lack of it to the mass or count properties of the incremental theme in direct-object position. In the corresponding unergative verbs, according to the l-syntax hypothesis, the verbs are derived via incorporation of a nominal root from direct-object position which has inherent mass or count properties. The l-syntax hypothesis makes it possible to attribute the parallel telicity properties of the unergative verbs and their transitive paraphrases to the same mechanism, which creates an event–object homo-

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[2] The verb *spit* is an apparent problem. In its nominal form, it is definitely a mass noun (*some spit* vs. *#two spits*). However, the verb seems to be a semelfactive unergative in its behaviour (see below). I will consider it to be naming an event (the act of spitting) rather than a thing, and treat it like *jump* or *knock*.

[3] There is a telic reading available for this verb as well: *The female salmon spawned in thirty minutes*. Similarly, the verb of bodily emission *pee*, which does have an atelic reading as predicted by its non-delimited nature (*John peed for five minutes*), also has a telic reading available: *John peed in five minutes*. I assume that the telic reading is coerced into existence by pragmatic/real-world knowledge: the internal container of pee and spawn in the relevant organisms is quite saliently delimited, and can be easily treated as such at a post-syntactic level by the Universal Packager. For this paper, the crucial piece of evidence is the availability of an *atelic* reading for these verbs.

morphism between an event and the element which is *underlyingly* in direct object position. It is not, however, important for the underlying direct object to check any features in the specifier of a telicity-sensitive functional projection: whatever mechanism produces the event–object homomorphism depends on the underlying position of the object, not on features that the object may or may not check (on its way to) its surface position.

3.3.1 *Denominal unergatives with Event roots*

So far, we have investigated two types of Root: Roots that denote Things that are either delimited or non-delimited (henceforth we will use Jackendoff (1991)'s terminology and call them 'bounded' or 'unbounded'). A bounded Root in direct-object position gives us telic predicates, measured out by the bounded Root, just like any other Incremental Theme, while unbounded Roots in complement position result in atelic predicates. We can sum up the typology of Roots so far as follows:

(18)

Boundedness value → ↓Referent of √	bounded	unbounded
Thing	*foal*	*drool*

Hale and Keyser proposed the same l-syntactic structures for other denominal unergative verbs, in particular unergative verbs with Roots which name Events, like *run, dance, jump, whistle*, etc. In (19) and (20), we see that denominal unergatives with Event-naming Roots cannot be telic, unlike the verbs of birthing above. Rather, they are either activities, as in (19), or instantaneous events, as in (20), which may be coerced to a repetition reading when they occur with an atelic frame adverbial. Following Smith (1991), I shall call the latter 'semelfactives'.

(19) Activities

    a. Sue danced   for five minutes/#in five minutes.

    b. Sue whistled   for five minutes/#in five minutes.

    c. Sue slept   for five minutes/#in five minutes.

(20) Semelfactives

    a. Sue hopped   #for five minutes/#in five minutes.

    b. Sue tripped   #for five minutes/#in five minutes.

    c. The light flashed   #for five minutes/#in five minutes.

Hale and Keyser's (H&K's) proposed structure for such verbs is represented in (21) below:

(21)   L-syntax for unergative verbs of activity
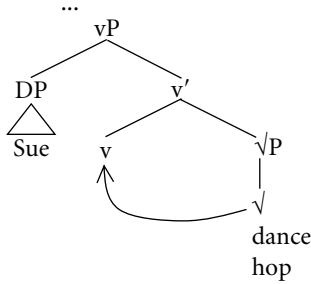
'Sue danced/hopped.'

Again, H&K intended these to have semantic properties similar to those of their paraphrases, such as *do a dance* and *do a hop*, and again, in (22) below, we see that the same Aktionsart properties hold of the unergative and its transitive paraphrase:

(22) a. Sue danced   for five minutes/#in five minutes.

  b. Sue did a dance   for five minutes/in five minutes.

  c. Sue hopped   #for five minutes/#in five minutes.

  d. Sue did a hop   #for five minutes/#in five minutes.

Note the one difference in the paraphrases: *dance* in its nominal form is a count noun, and a measured-out telic reading is available for the transitive paraphrase in 20(b). As with *spawn* and *pee* (see n. 3 above), the important thing to notice is that *do a dance* does allow an atelic reading, indicating that it may be interpreted unboundedly.

I assume that the distinction between *dance* and *hop* is the same as the distinction between *drool* and *foal*: *dance* is an unbounded Root and *hop* is a bounded one. There is a crucial difference between bounded Things and bounded Events, however: bounded Event Roots do not result in an Accomplishment interpretation of the vP that they occur in. They name an Event that occurs at a point in time, not one that evolves over time. In the case of the bounded Thing Roots, the measuring-out occurs over the physical quantity of the bounded Thing(s) in question. I hypothesize, following Pustejovsky (1991) and Jackendoff (1991), that while bounded Things must necessarily take up a certain amount of space, linguistic Events fundamentally are either point-like (instantaneous) or extend for an arbitrarily long time (activities). Events

which unfold over time and then culminate—Accomplishments—are made up of two (sub-)Events, rather than just one (again following Pustejovsky (1991)). Monomorphemic Event-naming Roots like (*a*) *run* or (*a*) *jump*, therefore, can only name events that are instantaneous or arbitrarily long. When a point-like Event Root occurs in direct object position, the measuring-out effect—the event–object homomorphism—therefore produces a point-like meaning for the vP containing it. The typology of Roots we have considered so far, then, is seen in (23):

(23)

Boundedness value→ ↓Referent of √	bounded	unbounded
Thing	*foal*	*drool*
Event	*hop*	*dance*

In sum: we have seen that, in H&K's l-syntactic account, all unergative verbs are created by incorporating a nominal Root into a light verb. The telicity of the resulting verb can be predicted on the basis of the ontological category of the Root (Event or Thing), and whether that Root denotes a bounded or an unbounded entity, by assuming that an event–object homomorphism is established which determines the Aktionsart of the vP. Incorporating a bounded Thing Root produces an accomplishment, since the homomorphism will measure-out the event according to the inherently finite spatial extent of the Thing in question. Incorporating an unbounded Thing or Event Root produces an activity, since the homomorphism measures-out the event according to the inherently infinite extent of the Event or Thing named by the Root. Finally, incorporating a bounded Event Root produces a semelfactive, since the homomorphism will peg the unfolding of the event identified by the vP to the punctual nature of the Event named by the Root.

3.3.2 *Transitive atelic and semelfactive verbs*

Recall one of our classes of problem verbs from section 3.2 above, exemplified by *push, hit*, and *kick*. They have a 'non-affected' object which cannot measure-out. In the past, this has been attributed to Tenny (1992*a*)'s Affectedness Condition, which governs the application of mapping rules. Since these are non-affected direct objects, the reasoning goes, they do not create the object–event homomorphism effect and do not behave like Incremental Themes.

(24)   a. John pushed the cart   for five minutes/#in five minutes.

        b. Sue drove the car   for five minutes/#in five minutes.

c. Sue kicked the wall   #for five minutes/#in five minutes.

d. A bird pecked Sue   #for five minutes/#in five minutes.

The Affectedness Condition is famously problematic to make precise: for instance, in *A bird pecked Sue*, above, my intuitive feeling is that *Sue* is considerably more 'affected' by the event than is *the book* in *Sue read the book*; nonetheless the latter is an Incremental Theme while the former is not. Further, such verbs create a problem for the structural characterization of the application of the event–object homomorphism that was so useful to us above. If the objects of these verbs are in the same structural position as the objects of verbs of creation and consumption, or as the Roots of the unergative verbs discussed above, then we expect an event–object homomorphism to be possible in these cases.

H&K's l-syntax makes possible a potential account of such verbs. Notice that these verbs themselves are denominal, formed on a monomorphemic Event-denoting Root: *a push, a drive, a kick, a peck*. If Event-denoting Roots can select for a complement, we can group these together with the unergative verbs with Event-denoting Roots in (19) and (20) above. Note that they have the same range of Aktionsart properties: they are all either activities or semelfactives. This would then entail that they have the structure in (25) below:

(25)
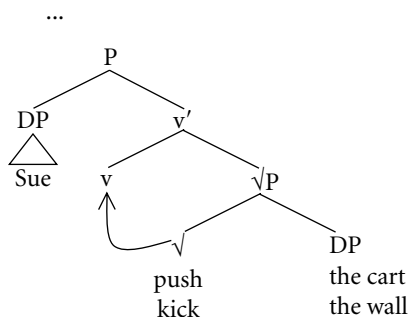
The DP which ultimately ends up checking accusative case, then, is *not* in the base-generated direct-object position of the verb. That position—sister to v—which produces event–object homomorphism is occupied by √P, whose boundedness properties are those of the Root. Since the Root names an Event, then, the homomorphism mechanism will produce a punctual semelfactive like *kick* or an activity like *push*.

If Roots can take a complement, then one expects to see complement-taking denominal Roots which denote Things as well as Events. Potential examples seem very hard to come by, however. Let us suppose that, in general, Roots denoting Things cannot select arguments, for some as yet mysterious reason, while Event-naming Roots can do so. Our inventory of basic Root properties now looks like (26).

(26)

	no complement		complement	
	bounded	unbounded	bounded	unbounded
Event	*hop*	*sleep*	*kick*	*push*
Thing	*foal*	*drool*	N/A?	N/A?

The reason, then, that the surface objects of these verbs cannot measure-out is that they in fact occupy a derived 'object' position—they check Accusative Case, but do not occupy the sister-to-v position that licenses the event–object homomorphism. The underlying sister-to-v, which determines the Aktionsart of the vP, is the projection of the Event-denoting nominal Root which incorporates into v to produce the verb itself.

3.3.3 *Change-of-State verbs*

Above, we have considered the structures which result when a nominal Root is directly incorporated into a verb. In such cases it is the nature of the Root itself which determines the Aktionsart properties of the verb. In another class of structures, the Aktionsart of the verb is determined by the degree to which some state is true of the Theme of the verb. These are, of course, the change-of-state verbs, usually de-adjectival, illustrated in (27) below:

(27)   Deadjectival change-of-state verbs

    a. Sue cleared the table   #for five minutes/in five minutes.

    b. The archaeologist opened the
       sarcophagus   #for five minutes/in five minutes.

    c. Sue tamed the lion   #for five minutes/in five minutes.

These verbs appear to have a very straightforward semantic analysis in terms of CAUSE + STATE. In the syntax, the STATE is represented by a small clause (SC) consisting of the adjectival state predicated of the object. Some undergo the inchoative/causative alternation (via a change in the v which selects for the SC), some do not. The SC structure for such verbs is illustrated in (28).[4]

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[4] H & K actually propose a more complicated representation than this, where the predication of the small clause is not direct, but is mediated by a lower V head, rather like Bowers' (1993) or Baker's (2003) PredP. See e.g. Hale and Keyser (this volume) for more discussion.

(28)
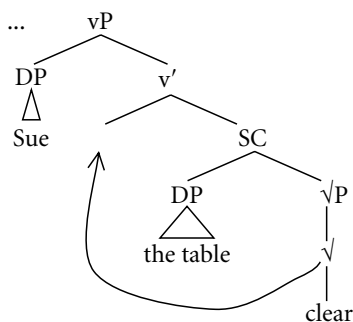
'Sue cleared the table.'

Here, the surface object DP is in what H&K call the 'inner subject' position.[5] It itself does not 'measure-out'. Rather, as was the case above, the constituent in the sister-to-v position is the thing that is subject to the homomorphism effect, i.e. the Small Clause itself. In these cases, the measuring-out is with respect to the entire *state* denoted by the small clause—the degree to which the table is *clear*. When that state is achieved, the accomplishment denoted by the whole construction is over. Here, then, we have a homomorphism between the Event and the degree of satisfaction of a state, rather than the Incremental-Theme style Event–Object homomorphism. Note that the whole is constructed from two eventualities: the CAUSE event (little v), and the (END)STATE event (the small clause). This has the nice property of making syntactically explicit the semantic decomposition of accomplishments proposed by Pustejovsky (1991) and others.

There do seem to be complement-taking State-denoting roots: contrast the de-adjectival change-of-state verbs and their resultative paraphrases in (29) and (30).

(29) a. Jill cleared the table (of dishes).

   b. Jill swept the table clear (of dishes).

   c. Jill emptied the box (of marbles).

   d. Jill made the box empty (of marbles).

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[5] For an alternative treatment of this decomposition within a H&K-style analysis, see Erteschik-Shir and Rapoport, this volume.

(30)   a. Jill flattened the metal (#of bumps).

      b. Jill hammered the metal flat (#of bumps).

      c. Jill roughened the surface (#of scratches).

      d. Jill made the surface rough (#of scratches).

The states in (29) seem happy to take a complement, while those in (30) do not. Further, there do seem to be bounded and unbounded states. Weschler (2001; this volume) shows that adjectival resultatives can only be formed on selected objects with closed-scale adjectival predicates (31), although both closed-scale and open-scale adjectival predicates can form change-of-state de-adjectival verbs (32):

(31)   a. Jill wiped the table clean.

      b. #Jill wiped the table dirty.

      c. Jill hammered the surface flat.

      d. #Jill hammered the surface rough.   (on a resultative, not a depictive, reading)

(32)   a. Jill cleaned the table.

      b. Jill dirtied her face.

      c. Jill flattened the surface.

      d. Jill roughened the surface.

The closed-scale/open-scale distinction may represent the [±bounded] feature applied to (scalar) State-denoting Roots. De-adjectival verbs based on [−bounded] State Roots, then, should be at least potentially atelic, and indeed, that has been claimed in the literature (Hay et al. 1999), based on examples like those in (33) (note the paraphrases).

(33)   a. Bill lengthened the rope for five minutes.

      b. (Bill made the rope longer for five minutes.)

      c. The storm lessened for five minutes.

      d. (The storm became less for five minutes.)

If that is so, then we have the possible Root meanings shown in (34).

(34)

	no complement		complement	
	bounded	unbounded	bounded	unbounded
Event	*hop*	*sleep*	*kick*	*push*
Thing	*foal*	*drool*	N/A?	N/A?
State	*flat*	*rough*	*clear*	??

One final note concerning de-adjectival change-of-state verbs. There does appear to be an event–object homomorphism at work in these cases, since changing the object of such a verb from a count to a mass noun, or from a singular to a plural noun, affects the telicity of the entire event in a familiar way, as illustrated in (35);

(35) a. Jill flattened the piece of tinfoil   in five minutes/#for five minutes.

  b. Jill flattened tinfoil   #in five minutes/for five minutes.

  c. Jill cleaned the dish   in five minutes/#for five minutes.

  d. Jill cleaned dishes   #in five minutes/for five minutes.

In this case, however, unlike the case of verbs of creation or destruction, or the unergative verbs, discussed above, the effect of the boundedness of the object on the boundedness of the event is only indirect. Changing the boundedness of the object in de-adjectival change-of-state verbs changes the status of the small-clause state which is the actual delimiter of the event: it changes the amount of stuff to which the state has to apply in order for the event to be complete; formerly it was a bounded amount of stuff, but when the subject of the SC is pluralized it is an unbounded amount. Consequently the state denoted by the small clause changes from bounded to unbounded. The required homomorphism between the vP event and the v's SC sister, the state, means that the entire vP's Aktionsart changes. We will see a similar indirect effect at work in prepositional-phrase complements to v in the next section.

So far, then, we have seen the l-syntaxes of unergative, semelfactive, and change-of state verbs, and asserted that a homomorphism is established between the v and its sister, whether that sister is a √, a √P, or a SC. There is one major class of denominal verbs dealt with by H&K that we have not yet considered, however: the location/locatum verbs. We turn to these in the next section.

3.4 Denominal location/locatum verbs

Besides the denominal unergative verbs discussed in section 3.3.1 above, Hale and Keyser (1997) propose an l-syntactic structure with incorporation of a nominal Root for a large class of transitive denominal verbs, location and locatum verbs. Some examples of each are given in (36) and (37); for more such verbs and important discussion, see Kiparksy (1997).[6]

(36)   Location: *bag, bank, bottle, box, cage, can, corral, crate, floor* (opponent), *garage, jail, kennel, package, pasture, pen, photograph, pocket, pot, shelve, ship* (the oars), *shoulder, tree.*

(37)   Locatum: *bandage, bar, bell, blindfold, bread, butter, clothe, curtain, dress, fund, gas, grease, harness, hook, house, ink, oil, paint, pepper, powder, saddle, salt, seed, shoe, spice, water, word.*

H&K propose that the same l-syntactic structure is the source of all such verbs. In essence, these are a sub-case of the SC de-adjectival cases above, except that instead of an adjectival predicate, the SC predicate is prepositional, denoting a change in the relative positions of the Inner Subject and some other entity, the location/locatum argument. They give paraphrases of the form in (38) and (39) below, illustrating in overt syntax the underlying structure they propose for verbs like *bag, corral, saddle*, and *paint*:

(38)   a. Bill put the snake in the bag.

b. Bill bagged the snake.

c. Jill herded the horse into the corral.

d. Jill corralled the horse.

(39)   a. Jill fit the horse with a saddle.

b. Jill saddled the horse.

c. Bill smeared the wall with paint.

d. Bill painted the wall.

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[6] Kiparsky (1997) points out that when the incorporated nominal is both a plausible location and a plausible locatum, both readings are often possible:

(i) John indexed the book.   (=location: put the book in an index).
(ii) John indexed the book.   (=locatum: provided the book with an index).

Note that although the objects of the prepositions in (38) are locations and those in (39) are locatums (i.e. in (39) the object of the preposition is moving relative to the Inner Subject, while the reverse is true in (38)), the structure of the paraphrases, and the l-syntactic structures, that H&K propose for these verbs are identical. The structure is in (40).

(40)

'Jill corralled the horse.'
'Bill painted the wall.'
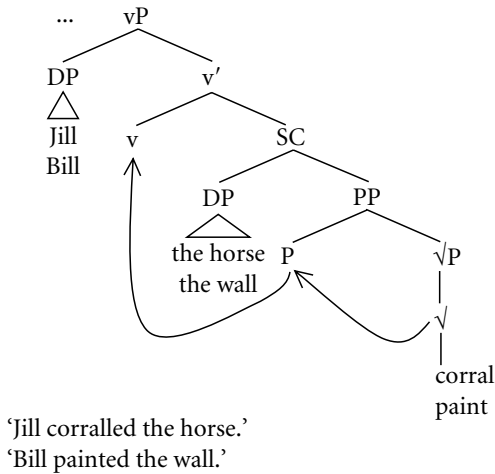
The abstract preposition, according to H&K, is a 'relational element' which establishes a meaningful link between the DP and the √P; they distinguish between a P of 'central coincidence' and a P of 'terminal coincidence', although it seems likely to me, following Mateu (2001), that the distinction is unnecessary in these instances. One can identify a location or locatum based on external, encyclopedic knowledge, and it may well be superfluous to encode the distinction in the grammar.

Is there any way that we can test the structural validity of this proposal? If the line of reasoning proposed above is correct, the structural consequences of the l-syntax should mean that things which affect the Aktionsart of the paraphrases of these verbs should carry over to the verbs themselves, since their l-syntax is equivalent to their paraphrases' overt syntax.

First, just as in the de-adjectival cases above, changing the number of the Inner Subject affects the measuring-out properties of the prepositional Small Clause (41), and, as we expect, changing the number of the direct object of the paraphrase has an identical effect (42).

(41) a. John saddled the horse   #for five minutes/in five minutes.

b. Sue boxed the computer   #for five minutes/in five minutes.

c. Mom blindfolded a six-year-old #for a minute/in a minute.

d. John saddled horses   for five minutes/#in five minutes.

e. Sue boxed computers   for five minutes/#in five minutes.

f. Mom blindfolded children   for five minutes/#in five minutes.

(42) a. Mom fit the child with a blindfold   #for five minutes/in five minutes.

b. Mom fit children with a blindfold   for three hours/#in three hours.

c. Sue put the computer in a box   #for five minutes/in five minutes.

d. Sue put computers in a box   for five minutes/#in five minutes.

This is the same phenomenon as in the de-adjectival cases, and so not surprising. If we look a little more closely at the paraphrases, however, we find that the Aktionsart of the vP is sensitive to changes in the number or mass/countness of the *indirect* object as well—changing the plurality or massness of the object of the preposition also affects the overall telicity of the paraphrase (43).

(43) a. Sue put the computer in boxes   for five minutes/#in five minutes.

b. Sue fit the horse with saddles   for an hour/#in an hour.

Although these are pragmatically odd (involving repeatedly doing something to the same computer or horse), manipulating the boundedness of the prepositional object does affect the Aktionsart of the predicate. If, in verbs like *corral* and *paint*, the nominal roots of the verbs originate in the same position as the objects of the prepositions in (43) above, then we ought to be able to predict the telicity of such verbs by noticing whether the incorporated Thing-denoting Root is inherently bounded or inherently unbounded, exactly as we did with the unergative verbs *foal* and *drool* above. In fact, this turns out to be the case. When the incorporated Root is a bounded Thing, as in (44) below, the location/locatum verb must be telic. When it is an unbounded Thing, however, as in (45) below, the verb may be atelic.

(44) a. John saddled the horse   #for five minutes.

b. Sue boxed the computer   #for five minutes.

c. Mom blindfolded a six-year-old #for a minute.

(45)   a. Susan watered the garden   for an hour.

      b. Bill greased the chain   for five minutes.

      c. Jill painted the wall   for an hour.

      d. Adelaide buttered the bread   for two minutes.

To recap: we attribute the introduced atelicity of the paraphrases in (43) to the introduced unboundedness of the prepositional object. Similarly, we can explain the available atelicity of *to paint* in contrast to the necessary telicity of *to saddle* by attributing it to the unboundedness of the incorporated nominal Root in *paint,* vs. the boundedness of the incorporated nominal Root in *saddle.* The same interpretive mechanism, applied to the same underlying structure, will account for the Aktionsart properties of both sets of sentences.

3.5 Implications, speculations

There is one major class of denominal verbs not discussed by Hale and Keyser which does not fit into the picture sketched above in the least. These are activity verbs named after the instrument used to accomplish them, illustrated in (46) below:

(46)   a. John hammered the metal   for five minutes/in five minutes.

      b. Sue brushed the dog   for five minutes/in five minutes.

      c. Jill raked the leaves   for an hour/in an hour.

Notice that the (necessary) boundedness of the nominal Root here (*brush, hammer, rake*) has no effect on the potential atelicity of the vP. Given the picture presented above, this means that the source of these denominal Roots cannot be within the argument structure of the vP, either as sister to v or in the Inner Subject or prepositional object positions of a Small Clause, since elements originating in any of these positions *do* affect the telicity of their vPs. Considering the thematic role of the incorporated nominal in these examples, this makes sense: these incorporated nouns are neither Themes nor Location/ Locatums, but rather Instruments. Instrumental phrases, in the overt syntax, are adjuncts to vP, not arguments of it. Good paraphrases of these sentences might look something like (47).

(47)   a. With a hammer, John hit the metal.

      b. Sue stroked the dog with a brush.

      c. Jill pushed the leaves with a rake.

How can an element conflate with v from an adjunct position? While I do not pretend to understand how this can happen, since it runs counter to the assumption that incorporation of Roots in l-syntax is governed by the same principles that restrict head-movement in the overt syntax, it seems clear that some mechanism must be proposed which has exactly this effect. As a first pass, I propose to name this mechanism 'Manner Incorporation'. Via Manner Incorporation, a v may be named by a Root describing the Manner in which it is accomplished.[7] Assuming that all adjuncts, including Instrumental ones, are a species of Manner, these denominal verbs represent an occurrence of Manner Incorporation applying to an l-syntactic structure that would normally give rise to a verb of contact, involving a complement headed by an Event-denoting Root. For want of a better notation, I provisionally represent the effects of Manner Incorporation via a 'thought balloon' applying to the v.

(48)
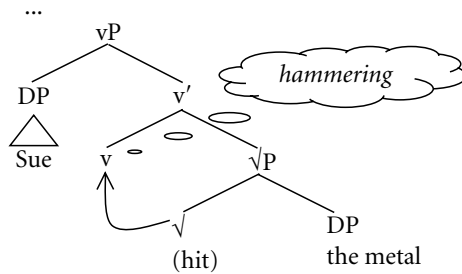
'Sue hammered the metal.'

The idea is that, in English, at least, v can pretty freely be named after a Manner, instead of being named by the more usual head-movement mechanism which allows v to get its name via incorporation of a Root from lower in the argument structure.[8] Manner Incorporation is how the verbs in H&K's paraphrases presumably get their names, as in the illustrations below:

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[7] The same process is at work in Gleitman's (1990) example of the independent meaning supplied by the ditransitive frame. If you take a verb like *think*, which usually takes only a CP or DP complement, and force it into a ditransitive frame—*Sue thought the book to Mary*—what results is not ungrammaticality. Rather, we interpret thinking as a manner element describing the way in which the book was transferred to Mary (telepathically or telekinetically, probably). Cf. also the insights of construction grammar (Goldberg 1995).

[8] Haugen (2004) and Siddiqi (2004) note that within a late-insertion framework like that of Distributed Morphology, this mechanism could naturally be treated as a subcase of late insertion, conditioned by the underspecification mechanism operative in late insertion of phonological material in general. In Manner Incorporation cases, the semantic features of the v are compatible with the semantic features of several different roots. Manner incorporation, then, would simply be implemented as English allowing the late insertion of highly specified, 'lexical' roots to realize the semantic features of the v.

(49)

a.   ...

'Jill fit the horse with a saddle.'

b.

'Bill smeared the wall with paint.'
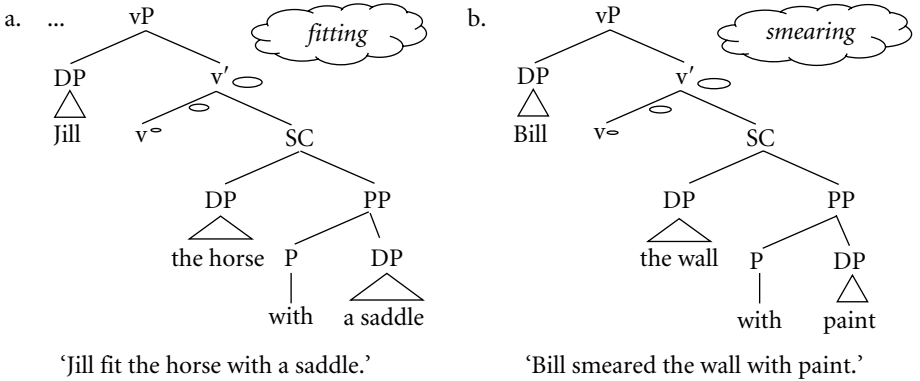
This notion that verbs in English can be named after the manner in which they are accomplished, assuming that encyclopedic considerations can be accommodated, has implications for the treatment of resultative constructions in English. For instance, when one adds a resultative PP to a verb like *push*, as in *John pushed the cart to New York,* the argument structure is suddenly changed from that of an incorporated Event-denoting, complement-taking Root to a prepositionally headed Small Clause, as indicated by the paraphrases in (50), where DO and CAUSE are glosses of the approximate content of the v in the construction:

(50)   a. John pushed the cart.   John DO [$\sqrt{}$P(a)$\sqrt{}$ push (of) the cart]

        b. John pushed the cart to New York.   John CAUSE [$_{sc}$ the cart to New York]

In (49b), there is no room for the $\sqrt{}$*push* event nominal in the argument structure of the vP, which is now saturated with a State complement complete with an internal subject (*the cart*) and a predicate (*to New York*). 'Pushing' is now relegated to a mere Manner element, which is used as a pronunciation for the v via Manner Incorporation. A good paraphrase would be something like *John caused the cart (to go) to New York by pushing.* Consequently, a v may get the same name (*push*) via two distinct processes, depending on the argument structure of the vP that it's in. For an extended discussion of this type of phenomenon, see Mateu and Rigau (2000) and Folli and Harley (2003), including an exploration of the notion that the availability of something like Manner Incorporation may vary parametrically, providing an account of the

absence of resultatives and goal-of-motion constructions in the Romance languages generally (cf. Talmy 1985).

In fact, it is this process which gives us the names of verbs of creation, consumption, and destruction quite generally. Recall that above, we proposed that unergative verbs like *foal* and *drool* have an underlyingly transitive structure, and that the Thing-naming Root in sister-to-v position measured-out the event of *foaling* or *drooling* via the same event–object homomorphism that is at work in *Jill wrote the letter* or *Bill ate the muffin*. In order to maintain the notion that the event–object homomorphism arises between v and its sister, *Jill wrote the letter* must have the same structure as *The mare foaled*: it must be the equivalent of a 'paraphrase' of that structure, including a manner element—something like *Jill created the letter by writing*, as illustrated in (51).

(51)

'Jill wrote the letter.'
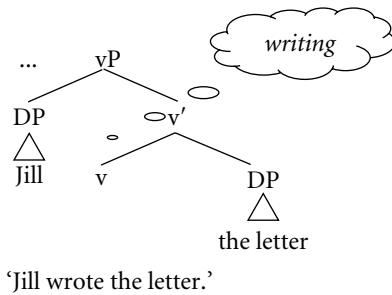
An interesting phenomenon, discussed at length by Kiparsky (1997), is that there seem to be idiomatic effects which restrict or enlarge the interpretation of l-syntaxes with conflation that are not in effect in the corresponding paraphrases with Manner Incorporation. For instance, in *Jill corralled the horse*, she can be understood simply to have cornered the horse in any enclosure, not necessarily a corral, but in *Jill put the horse in a corral*, the corral must be a literal corral. Similarly, verbs of creation with conflation in English are restricted to cases where the subject is creating the Theme in an inalienable way, usually 'out of' the subject's own body. Hence one can say *Jill drooled* but not *Jill caked*, meaning 'Jill made a cake'. Without conflation, however, there is no such restriction on verbs of creation, despite their identical structure; consequently *Jill made a cake* or *Jill wrote a letter* are fine. I do not understand this phenomenon, but it clearly goes hand in hand with the restrictions on the productivity of at least some l-syntactic configurations, and deserves further investigation.

One final remark: some 'manner' names are so 'light' as to be almost meaningless. Such verbs are often provided as glosses of v in various environments; examples in English include 'do', 'make', and 'cause'. Each has its own preferential environment of insertion; *do* is generally used as a neutral realization of v when its complement is an Event, hence *do a dance, do work,* etc. When the complement of v is a Thing, *make* is a fairly unmarked realization of the content of v, as in *make a cake, make a letter*, etc. Finally, *make* or *cause* is often used when the complement to v is a State, as in *make Bill sick* (cf. *sicken Bill*) or *cause the table (to be) clear* (cf. *clear the table*). As should be clear by now, I consider that it is the same little v in all cases: one that denotes the beginning of an event, and its initiator. It is just a weakness of English that there is no single 'manner' verb that can spell out v in all three environments. We make Things, we do Events, and we cause states, but in French, for example, all three English verbs translate the same way: *faire*.

3.6 Concluding remarks

I have here presented evidence that the structural effects of Hale and Keyser's l-syntax make correct predictions concerning the effect of Root type on the Aktionsart of denominal verbs, if Roots are inherently specified as bounded or unbounded. Assuming the correctness of this type of approach, I have explored its consequences for the ontology of Root types, concluding that there are at least Roots which name Events, Things, and States, and bounded and unbounded, and complement-selecting and non-complement-selecting, varieties of each. Finally, I have considered the implications of the approach for other spell-outs of v, concluding that there must be a fairly unrestricted, non-structure-dependent process of v-naming available in English, which I called Manner Incorporation.

4

Path Predicates

NOMI ERTESCHIK-SHIR AND TOVA RAPOPORT

4.1 Introduction

In this chapter we explore connections among several types of path predicates. Our examination is conducted within a theory of the lexicon–syntax relation that we have been developing over the past few years. In this theory, the meanings of verbs are decomposed into atomic meaning components which themselves project syntactic structure. Because the meaning components themselves are responsible for syntactic structure, syntactic properties are directly derivable from the meaning of the verb; and the combination of the meaning components and the structures projected yields all the semantic properties of verbs as well. Moreover, since the inventory and number of meaning components is universally restricted, so are the types of structure that can be projected.

The restricted inventory of meaning components that comprise verbal meanings includes (as in much lexical research) Manner (= means/manner/instrument) (M), State (S), Location (L) and, as far as we are able to tell, not much else.

Meaning components may or may not project. In general, verbs with one component project an intransitive structure and only verbs with two meaning components (e.g. M+S, M+L) can project a transitive structure.

Certain one-component verbs form the class of what we view as path predicates. These include change-of-state verbs such as *cool* and *flash*, change-of-location verbs such as *advance*, and manner-of-progression verbs such as *march*. These verbs have a complex set of syntactic and semantic properties in common which, we argue, fall out naturally from our analysis.

4.2 Background

The lexical entry of a verb consists of the morphophonological verbal head and its meaning components, as shown in (1).[1]

(1)   BREAK: /break/$_V$ **M** ('forceful means') **s** ('broken')

The verbal head has only a phonological form (as well as a morphological classification) and no semantics. The meaning components, conversely, are pure semantic morphemes, with no phonology.[2] This is unlike the work of Hale and Keyser (e.g. this volume) or Harley (this volume), in which a light verb combines with a root containing both semantic and phonological properties. Here, following the early work of Hale and Keyser (e.g. 1993), each such semantic morpheme has categorial properties as shown in (2): MANNERS project N, STATES project A and LOCATIONS project P. (Categorial projection is language-specific, although here again, variation is limited.) The verbal head must always merge a complement in order to yield a typed predicate.

(2)

a. activity   b. change   c. change
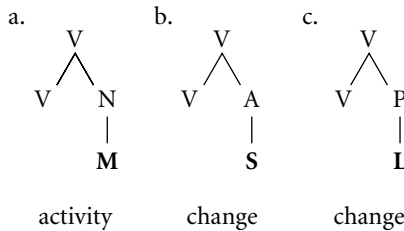
The predicate resulting from the projection of a verbal head and a meaning component complement is aspectually interpreted as follows: the V-N predicate projected by a verbal head and **M** is interpreted as an activity; the V-A and V-P predicates projected by V and **s** or **L** are both interpreted as 'change' predicates (a term that covers achievements, inchoatives, and unaccusatives/ ergatives). The restricted inventory of verbal components parallels the restricted inventory of lexical categories, restricting predicate types and consequently possible interpretations, following Hale & Keyser.

The projection of one-component verbs operates as follows: A simple **M** verb like *laugh* merges the structure in (2a). The morphophonological head projects V and the **M** meaning component projects its complement. The result

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[1] It seems, at least in the languages we have examined, that a verb's meaning may consist of at most two meaning components. Why no verb (without additional morphology) can have a double cause meaning is an interesting question.

[2] 'Broken' is a rough approximation of what *break*'s state meaning component is, i.e. something like 'separation in material integrity'. Throughout this paper, we will use such English representations of the concepts of meaning components.

is an unergative predicate with its typical aspectual interpretation. Simple **l** component verbs, such as *arrive*, and **s** verbs, such as *bloom*, merge the change structure in (2b, c).

When a specifier is merged with either of the two different predicate types, it is interpreted according to that predicate. The subject of the V-N activity predicate is interpreted as a (proto-)agent and the subject of the V-A and V-P change predicates is interpreted as a theme; this is shown in (3) (in which **α** signifies a proto-agent and **θ** a theme). In this way, the so-called 'theta-role' is derived structurally.[3] There is no further structural distinction between the two subject types.

(3)

```
      a.        V              b.        V              c.        V
              /   \                    /   \                    /   \
            D       V                D       V                D       V
            |      / \               |      / \               |      / \
            α    V     N             θ    V     P             θ    V     A
                 |                        |                        |
                 M                        L                        S

           activity                  change                   change
    e.g.     laugh                    arrive                   bloom
```
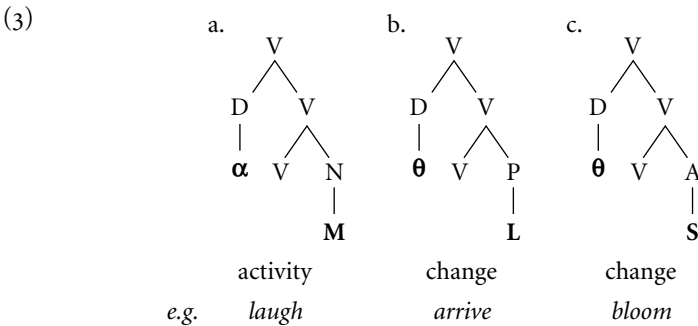
In addition to the three simple structures, a complex structure is also derivable. Chomsky (1998) suggests weakening the requirement that an item of a lexical array be removed when accessed in computation, thereby allowing multiple copies. We make use of this suggestion: multiple selection allows the merger of an additional copy of the verb with the structures of (3). This is how the complex structure of (4) is derived.

(4)

```
              V
            /   \
          D       V
          |      /  \
          α    V      V
                    /    \
                  D        V
                  |       /  \
                  θ     V     A/P

         causative
```

---
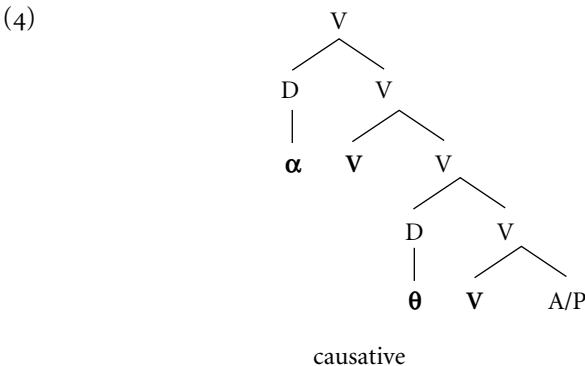
[3] See also Borer (1994; 2004) and Ritter and Rosen (e.g. 1998), in which arguments are the specifiers of particular functional projections.

The subject of the V-V structure is interpreted as a causer. Here, too, the 'thematic role' is derived structurally.[4]

In this way, the flexibility of component projection enables the derivation of a variety of interpretations from a *single* verb with a *single* lexical representation.

4.2.1 *Full Interpretation*

The main constraint on the acceptability of the freely projected structures is the principle of Full Interpretation (FI). We adopt the requirement expressed in FI by Chomsky (1986), that 'every element of PF and LF... must receive an appropriate interpretation', extending this requirement as in (5).

(5)   Full Interpretation:

   (i) The interpretation of a lexical verb v requires the interpretation of each meaning component of v; and

   (ii) the interpretation of each projection of v requires the interpretation of a distinct meaning component.

The result of FI is that a verbal head must always have a complement. Thus, FI captures the one-to-one relation between meaning components and predicate projections. In this way, the number of components of a verb restricts the number of projected copies of that verb, despite the freedom of projection in principle.

A projected meaning component aspectually types the predicate projected by v, thus allowing for its interpretation, as shown in (2). Non-projecting meaning components must also be interpreted. In order to illustrate this, consider the example of the two-component verb *break* (with the lexical entry in (1)), when it projects the intransitive change structure:

(6)
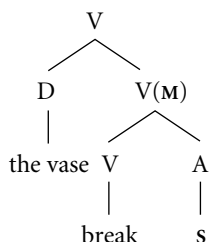
'The vase became broken (with force).'
=The vase broke.

---

[4] See Butt and Ramchand (this volume), in which the initiator semantic role is structurally derived; see also Doron (this volume) and Travis (this volume), in which agent and causer are subjects of different projections.

In this structure, *break*'s **s** 'broken' projects the complement of the verbal head, the resulting predicate receiving the change interpretation. *Break*'s other component, **m** 'force', is interpreted as modifying that predicate, resulting in the complete interpretation shown.

The verb *break* can also project the causative structure in (7).

(7)

```
                          V
                   ┌──────┴──────┐
                   D           V(м)
                   │          ┌──┴──┐
                  Jane        V     V
                              │   ┌─┴────┐
                            break D      V
                                  │    ┌─┴──┐
                                 vase  V    A
                                       │    │
                                     break  s
```
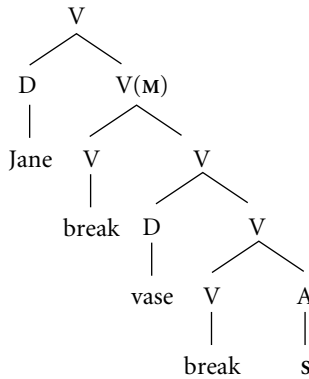
'Jane caused (with force) the vase to become broken.'
=Jane broke the vase.

Here two copies of the verb *break* are merged, forming a chain of which, as expected, only the head is pronounced. As before, *break*'s **s** projects the complement in the change structure, but here *break*'s **m** modifies the upper cause predicate, as shown. The complex structure in (7) is derived by free projection and merge.[5] Due to free projection, the structure in (6) can also be merged, with only one copy of the verb projecting. In this way we derive syntactic alternations from one lexical representation, the only restriction being FI.

We have seen that non-projecting meaning components, like structural adjuncts, are interpreted as modifiers. Accordingly, meaning components can be interpreted in one of two ways:

(8)   (i) via structural encoding:

            the meaning component projects its syntactic category

            and aspectually types the predicate

      (ii) via modification:

            (a) modification of a predicate = adverbial interpretation
            (e.g. (6, 7))

            (b) identification with a subject (see section 4.4.2)

---

[5] This complex structure is also projected by analytic causatives such as *Jane cut the bread into slices*, *Jane broke the glass into pieces*, *Jane hammered the metal flat*.

While every two-component verb can project either an intransitive or a transitive (causative) structure, not every such projection will result in an acceptable sentence, i.e. one meeting FI. Consider an instrumental verb, like *cut*, whose lexical entry is shown in (9) and which can project the causative, as shown in (10).

(9)   CUT: /cut/$_V$ **M** ('sharp instrument'). **s** ('cut')

(10)   a. Jane cut the bread.

　　　b.

```
                    V
                  /   \
                 D     V(M-INST)
                 |    /   \
               Jane  V     V
                     |    /  \
                    cut  D    V
                         |   / \
                       bread V   A
                             |   |
                            cut  s
```
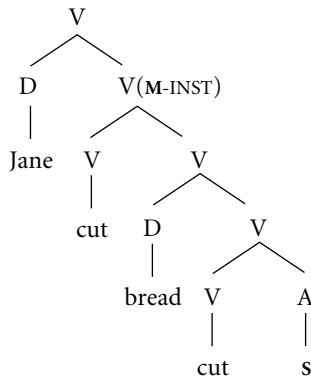
　　　'Jane caused (with a sharp instrument) the bread to become cut.'
　　　=Jane cut the bread.

Here FI(i) is satisfied since *cut*'s **M** modifies the upper cause projection and *cut*'s **s** is structurally encoded. FI(ii) is satisfied since the upper cause projection is licensed by **M**'s interpretation and the lower change projection is licensed by the interpretation of **s**.

But the intransitive change structure projected by *cut*, as shown in (11), violates FI.

(11)   a. *The bread cut

　　　b.

```
              V
            /   \
           D     V(M-INST)
           |    /   \
      the bread V     A
               |      |
              cut     s
```
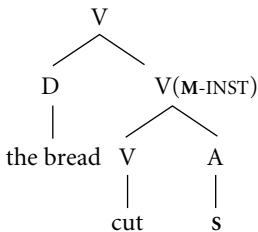
While the verb *break* allows this same structure because its means compon-ent, **m** 'force', can modify a change event, the verb *cut*'s **m** 'sharp instrument' cannot be interpreted in this way. (11b) violates FI(i) since an instrument **m** requires a referential wielder. The causative structure provides such a wielder, the upper subject. However, in the intransitive the **m** component is left uninterpretable in its absence.[6] The verb *cut* in the activity structure also violates FI:

(12)   a. *Jane cut

     b.
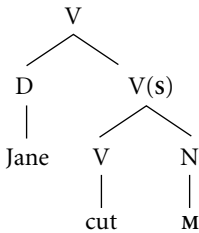
This structure violates FI(i), since **s** can never modify an activity predicate. For this reason, **Jane broke*, under an activity interpretation, is also unacceptable.

In summary, transitivity alternations are constrained by FI(i), which re-quires that each component be interpreted; the number of possible arguments is constrained by FI(ii), since each projection must be licensed by a component interpreted in it.

4.3 Path predicates

The theoretical framework just described allows the identification of a super-class of predicates.[7] These predicates include those projected by scalar **s** and **l** verbs such as *cool* and *advance*, by manner-of-progression (**m-prog**) verbs such as *march*, and by iterative verbs such as *flash* and *beep*. We classify the different predicate types together because of two properties that they all share: the possibility of an atelic reading (even for verbs that seem inherently telic) and the possibility of transitivization (even for verbs with one component only). These properties can be explained under our analysis of the nature of

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[6] This is true of a sentence describing a particular, referential event. The middle of instrument-**m**+**s** predicates is predicted to be grammatical. This is because middles are generic and generic wielders are always available. For details see Erteschik-Shir and Rapoport (1999; 2000; in preparation).

[7] The notion 'path' has been used in a number of different ways (e.g. Krifka (1998), Wechsler (this volume), and the references cited therein). Our view of the notion is both broader and narrower than that of others.

the components of the verbs involved and the nature of the syntactic-aspectual structures they project.

Let us consider the first property, atelicity. As expected with change verbs, the s and ʟ verbs *cool* and *advance* have a telic reading, shown in (13) with the use of the *in*-adverbial.[8] And whereas an atelic reading is to be expected with the M-PROG verb *march*, atelicity turns up unexpectedly with the two types of s and ʟ verbs as well as with the iterative *flash* and *beep* (as evidenced by the acceptable addition of the *for*-adverbial in the examples of (14)):[9]

(13) a. The army advanced in an hour.

b. The soup cooled in an hour.

(14) a. The soup cooled for two hours.

b. The army advanced for two days.

c. The soldiers marched for two days.

d. The light flashed for two hours.

e. The horn beeped for a full two minutes.

The second remarkable characteristic of all of these types of predicate is that not only do they project the intransitive structures licensed by their single meaning component, but they also allow transitives:

(15) a. Jane flashed the light.

b. Jane beeped the horn.

(16) a. Jane cooled the soup.

b. The general advanced the regiment.

c. The officer marched the soldiers.

This is not a property of all verbs, of course. Simple LOCATION and STATE verbs that are not characterizable as path verbs do not allow causativization/transitivization:

(17) a. *Jane arrived her guests.

b. *The good weather bloomed the flowers.

---

[8] In the telic reading, the end-point is supplied by whatever is considered enough of the change—forward progress or cooling—for the purposes of the particular context. Some s path verbs (e.g. *dry*) are interpreted with an absolute end-point. What is important to us here is not the nature of the end-point but the fact that ʟ and s path verbs, just like simple ʟ and s, can be telic. (See Harley (this volume), Wechsler (this volume) for different accounts of the telicity properties of de-adjectival verbs.)

[9] Like *break*-type instantaneous verbs, iterative verbs like *flash* and *beep* do not allow the *in*-adverbial.

In addition, the causatives of (15, 16) are distinct from the causatives derived from two-component verbs (ᴍ+ѕ/ᴍ+ʟ) such as *cut* and *break* discussed above. Here there is no particular manner in which the flashing, beeping, cooling, advancing, and marching is caused (these verbs having no ᴍ component to license the cause projection). The manner of causation is free; *any* manner that gives the relevant result will do: in (16a), Jane can cool the soup by refrigerating it, by pouring cold water in it, or in any way that is compatible with the soup's going down in temperature. In (16c), the officer can march the soldiers by yelling, leading the way, or in any other way that causes them to proceed in a marching progression.

We thus have an unexpected class of predicates, all of which can head telic or atelic predicates and all of which allow free transitivization. Why this is so is explained in terms of our analysis of path predicates.

4.3.1 *Paths and plurality*

What these predicates have in common is that they all can describe a sequential (incremental or iterated) change rather than the simple, single change described by other predicates. In other words, each of these predicate types can describe a path.

Given our framework's assumption of a severely limited inventory of components, we consider this path property to be most aptly, and correctly, described as a property of 'plurality'.[10] This analysis allows for a natural correspondence between nouns and verbs (and so between nominal phrases and verbal predicates): a noun can be singular, denoting an individual, or plural, denoting a collection of individuals. A verb, too, can be singular, describing an individual event, or plural, describing a collection of individual events.[11]

As a rough introductory example, consider the contrast between the singular verb *freeze* and the plural verb *cool*. *Freeze* involves a single change to a frozen (solid) state. Something is either frozen or not (any 'path'-like property deriving solely from the material nature of the theme, i.e. that freezing applies to it portion by portion). *Cool*, on the other hand, involves a series of incremental cooling changes.

To see why this is so, consider the lexical representations of *cool* and *advance*, the scalar-change verbs under discussion:

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[10] For different notions of plurality with respect to predicates and events see Guéron (this volume), Mittwoch (this volume), Wechsler (this volume).

[11] We cannot here explore all the parallels between nominal and verbal mass terms. And see Bach (1986) for an examination of the parallelism between the mass/count distinction and the process/event distinction.

(18)   ADVANCE   /advance/$_V$ L ('spatial axis, forward')

  COOL   /cool/$_V$ s ('temperature scale, down')

Each of these verbs describes a particular change: *advance* describes a change of location on a spatial axis in a forward direction and *cool* describes a change of state on a temperature scale in a downward direction.

  The predicate projected by *cool*, for instance (and here we follow Dowty (1979)), relates to a scale of the type roughly sketched out in (19).

(19)   more hot/less cool |--|--|--|--|--|--|--|--|--|--|--|--|--|--| more cool/less hot

$$cool \rightarrow$$
$$\leftarrow heat$$

This scale represents a series of temperatures, either from less cool to cool or from cool to less cool (a direction described by the verb *heat*).[12] Any change described by this kind of scalar verb can be broken up into a smaller series of changes, i.e. a plural change. Similarly, the change-of-location verb *advance* also projects a plural predicate.[13]

  Iterating verbs can also project a plural predicate, although in a different way. Iterating verbs (here, a subset of the class of semelfactives of Smith (1997)) describe a particular type of short (near-instantaneous) change: each involves a quick change away from and back to an original state, which we have represented as 'on-off' in the approximate lexical representations of (20).

(20)   FLASH   /flash/$_V$ s ('on-off visual')

  BEEP   /beep/$_V$ s ('on-off aural')

Each verb thus describes a change that involves its theme returning immediately to its original state. It is this 'on-off' property that always has the potential for repetition, i.e. pluralization.[14] Thus, the sentences (21), like the examples of (14d, e), are interpretable as describing not only a single (near-instantaneous) change but also a plural change, i.e. a series of (iterated) changes.

(21)   a. The light flashed.

  b. The horn beeped.

---

[12] That these are indeed the interpretations of the verbs *cool* and *heat* respectively is evidenced by the fact that the direction on the temperature scale can occur overtly, as in *cool down*, *heat up*.

[13] Like Krifka (1998), among others, we classify movement in space together with movement in other dimensions (e.g. temperature). We differ from Krifka in distinguishing those movements that are instantaneous changes of location (e.g. *arrive, leave*) from those that are incremental.

[14] We thus disagree with Smith's argument that semelfactives with the *for*-adverbial (e.g. (14d, e)) have a derived interpretation as multiple-event activities due to clashing temporal features. For us, these verbs have a change interpretation and there is no clash.

4.3.2 *Points on the path*

A defining characteristic of scalar s and l verbs is that because they describe a change of position along a scale, they make accessible a beginning position and an end position on that scale, as well as any position between those two points. Thus the beginning and end-points (and other locations in between, e.g. *halfway*) of events described by predicates based on such verbs are linguistically accessible (e.g. the end-point, as shown in (13)) or overtly specifiable:[15]

(22)   a. The soup cooled from 20°C to 10°C.

  b. The soldiers advanced from one town to the other.

  c. The soldiers advanced halfway to the next town.

  Manner-of-progression verbs, too, have the potential to be scalar in this way. Such verbs can head a change structure (with the aid of an overt PP, for example), as shown in (23) with the m-prog verb *march*.

(23)   a. The soldiers marched to the next town.

  b. The soldiers marched *(to the next town) in an hour.

We thus have a telic change predicate, in which the manner modifies, with a plural interpretation similar to that of *advance*.

  In this case, too, the beginning, intermediate, and end-points of the path of m-prog verbs can be overtly specified, as shown in (24).

(24)   a. The soldiers marched from one town to the other.

  b. The soldiers marched halfway to the next town.

Plural predicates have this property of identifying points along the path of change.[16] Singular predicates do not. While they may appear with an overt PP specifying the goal, the path to this point is not available and so no point on the path can be indicated:

(25)   a. Jane arrived (*halfway) to the US.

  b. Jane left (*halfway) to the US.

  c. Jane came (*halfway) to the US.

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  [15] These tests, for obvious reasons, cannot be used with the same conclusions with respect to light verbs, such as *go*, *change* and *turn*. See Erteschik-Shir & Rapoport (in preparation).
  [16] Iterative verbs, unlike scalar predicates, are not compatible with phrases like *halfway*.

We have thus identified three types of plural predicates: incremental scalar s/L, incremental M-PROG, and iterative (on-off s). Scalar and iterative verbs are interpretable as plural and M-PROG verbs have the plurality potential, realized when these verbs head a change predicate.

The idea behind our characterization of these predicates in terms of plurality parallels that underlying Tenny's (1987) notion of 'measuring-out', but whereas plurality is identified with particular predicates, measuring-out is identified with the incremental theme position. Like Dowty (1991), Verkuyl (1993), Jackendoff (1996), and Krifka (1998), we disassociate the 'measuring-out' relationship from a particular argument.

Our analysis differs significantly from those that have enlightened us: in line with our research programme, we derive the interpretations of the structures directly from a particular meaning component type in a particular structure type, rather than from idiosyncratic properties of particular verbs. Under our analysis, the meaning components L, s, and M have both a singular and a plural instantiation (the plural categorization derivable from a scalar/on-off component or from the potential afforded by progression).

An analysis in terms of singular and plural meaning components and predicates yields several benefits. For one, since other lexical categories can be pluralized, it is not surprising that this is also the case for verbs. For another, it means that the system of components and projections need not be unaccountably complicated by various subtypes of components. The natural distinction of components as singular or plural does not extend the (universal) inventory of components in any unnatural way; nor does it allow for any other distinctions. There are three components, singular or plural, and the structures they may project; and that is all.

Under our analysis, then, plural, or path, predicates are formed from plural s and L and M-PROG components. It is the plural interpretation that allows for their particular syntactic and aspectual properties. In the following sections we discuss how this is effected within our framework of the lexicon–syntax relation.

4.3.3 *Plural (a)telicity*

As we have seen, plural s and L components can project both telic and atelic predicates. The telic and atelic readings share the same structure, but a different aspect of the component is focused in each. Consider the structures in (26), projected by the s verb *cool* and the L verb

advance (in which the scalar nature of the component is represented as plural (pl)).

(26)

```
        V                           V
       / \                         / \
      D   V                       D   V
         / \                         / \
        V   A                       V   P
        |   |                       |   |
      cool  s-pl                 advance  L-pl
```
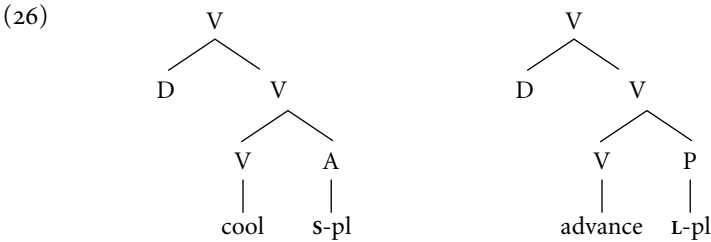
The telic reading is derived when the **s** or **L** facet of the component is focused and the plural facet is backgrounded, yielding an interpretation like 'The soup cooled (by increments)'. The atelic reading of the same predicate is derived when the plural facet of the component is what is focused, yielding a reading like 'The army was incrementally advancing'.[17] It is this plural reading that is compatible with the *for*-adverbial (as shown in (14)).

As is well known (e.g. Dowty 1979), the *for*-adverbial is also compatible with singular predicates (with which it is not usually compatible) when they are predicated of plural and mass themes. We see this in (27) and (28).

(27) a. *The glass broke for an hour

 b. The glasses broke for an hour.

(28) a. *A guest arrived for an hour

 b. Guests arrived for an hour.

Here the plurality of events ranges over the plural set specified by the theme subject.[18] A similar effect is achieved if the plural facet of verbs is interpreted in relation to a theme subject. This is sketched in (29).

(29)

```
            V
           / \
          D   V
          ↑  / \
          |  V  P
          |     |
          |    s/L-pl
          |_____|
```

---
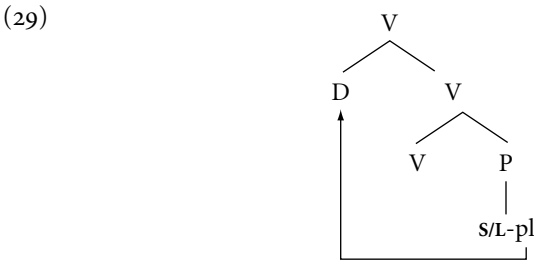
[17] The progressive is used here solely as an easy way of indicating atelicity. We do not discuss the details of the contribution of the progressive here.

[18] See Erteschik-Shir and Rapoport (in preparation) for an analysis of the effect of plural themes within our framework.

In (26), the plural is interpreted with respect to the change, rendering the plural-event reading, in which all the soup or the whole army changes location or state in tandem. Here, the change goes incrementally through the material constituting the theme, affecting it increment by increment, or part by part:

(30) a. The soup, 'part by part', became cool.

b. The army, 'part by part', went to an advanced location.

Under the interpretation in (30a), then, the soup is viewed as, for example, becoming cool first at the edges of the dish and then towards the middle. In (30b), the various parts of the army progress separately to the advanced location.

With respect to iterating verbs, when the visual or aural part of the state is focused, the on-off nature is backgrounded, yielding an interpretation like 'The light went to (and from) a shown state'. When, on the other hand the 'on-off' aspect of the state is focused, a plural is derived. Just as focusing on a scale gives increments of that scale, focusing on 'on-off' yields iteration.

As for M-PROG verbs, they form plural predicates only in change structures, when they are usually telic. Because they are complicated by having a particular manner, we discuss them separately (in section 4.4).

4.3.4 *Path control and transitivity*

We have claimed that it is the fact that a predicate is plural that allows it to freely transitivize. Such plurality derives either from the plurality of a STATE or location component or from the derived plurality of M-PROG verbs projecting a change predicate.

Let us consider the causative structure projected by the sentences in (16), as shown in (31).

(31)
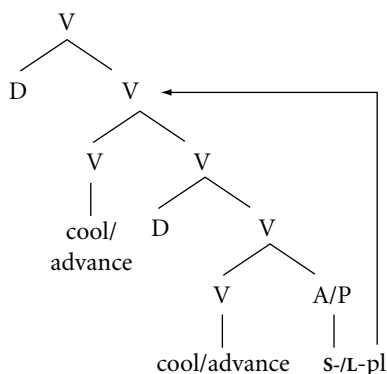
e.g. 'Jane cooled the soup.' 'The officer advanced the soldiers.'

There is still only one verbal component in each of the projecting verbs and yet two projections are licensed. In our view, this is because the plural change allows its causer to have an additional interpretation, that of controlling the extent of the path of that change. The upper subject, then, is not a simple causer, but also controls the sequences or repetitions—the incrementality—of the change. So sentences represented by the structure of (31) mean something like 'Jane caused the soup to become cool and controlled the extent of the cooling path'.

It is this additional interpretation, afforded by the plural facet of the meaning component, that licenses the upper projection. An upper projection (i.e. a transitive) would not be licensed with just a pure causer interpretation, i.e. without manner specification or path/plural control.

The cause projection thus meets FI (ii). This follows if 'meaning component of υ' in FI includes 'facet of a meaning component of υ'; and this would require, appropriately, that all facets of a meaning component be interpreted for the purposes of FI(i). In the cases under consideration here, a projection is licensed by the fact that the plural facet of a component is interpreted relative to it.

The licensing by the plurality rather than by manner also explains why the causer need not do anything particular in order to initiate the event. And whether the causer merely initiates and ends the event or actively monitors it throughout, in all the transitive cases, the causer controls the path of the change.

Evidence that the plural element necessarily modifies the upper predicate in the causative is the fact that *for*-adverbials must be interpreted as modifying the cause event and not the change event. Consider the examples in (32).

(32)   a. Jane cooled the soup *for an hour*.

  b. The officer advanced the regiment *for an hour*.

  c. The officer marched the soldiers *for an hour*.

In (32b), for example, the officer might have given an order for the regiment to advance for an hour, or else she may have given an order for the regiment to stop advancing after an hour. In either case the officer is understood to be in control of the duration of the event. This sentence does not describe a situation in which the officer gave an order to advance and then the regiment proceeded, without any further involvement by the general (an order to stop, for instance), for an hour. The same goes for (32a). The sentence must be interpreted with the *for*-adverbial relative to Jane's control. The intuition that

the durational adverb modifies the change derives from that fact that if the causer is controlling the increments of a change, the theme of that change must necessarily change accordingly.

This property of path verbs, that they can project the transitive structure in spite of the fact that they are one-component verbs, thus follows naturally from their interpretation as paths, i.e. as plurals. The causative structure is therefore limited to two-component (M+S, M+L) verbs and to plural predicates. This means that M-PROG verbs have a special status. On the one hand, they contain an M component; on the other, they also form plural predicates. As a result, they potentially license two different causative structure interpretations.

4.4 The projections of M-PROG verbs

M-PROG verbs, like all manner verbs, can project an activity structure. In addition, they may also project a change structure or a causative structure (each possibility restricted by the particular M component). Examples of sentences associated with the different structure types are given in (33).

(33)   a. Jane ran/rolled/marched. (*activity*)
    b. Jane ran to the store/The ball rolled. (*change*)
    c. Jane ran Peter to school/rolled the ball/marched the students to the principal's office. (*causative*)

An approximation of the lexical representation of these M-PROG verbs is shown in (34).[19]

(34)   RUN: /run/$_V$ M-PROG ('rapid')
    ROLL: /roll/$_V$ M-PROG ('round')
    MARCH: /march/$_V$ M-PROG ('rhythmic')

4.4.1 *Manner of progression as activity*
Deriving the simple sentences of (33a) from the projection of the M component as N is straightforward:

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[19] *Run*'s manner might be better described as 'rapid or efficient', following the discussion of *run* and *walk* in Ritter and Rosen (1996; 1998).

(35)

```
              V
            /   \
           D     V
           |    / \
         Jane  V   N
               |   |
              ran  M-PROG
```
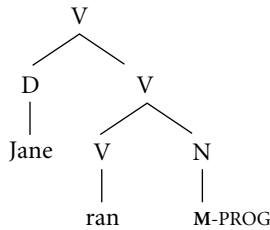
The projected structure is an atelic unbounded activity whose V-N predicate imposes an actor interpretation on its subject, 'Jane engaged in (an activity of) a rapid manner of progression'. We understand this activity as 'running'.

4.4.2 *Manner of progression as change*

The same verb whose component projects an activity structure can head a change structure, shown in (36), representing (33b). Here, an overt prepositional phrase collaborates with the M-PROG verb in projecting the V-P structure.

(36)

```
                V
              /   \
             D     V (M-PROG)
             |    /    \
           Jane  V      P
                 |      /\
                ran   to the store
```
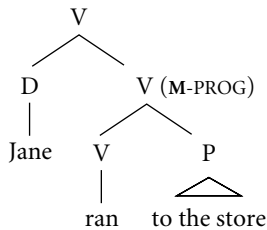
This V-P structure is interpreted as a change of location of a theme, the only interpretation possible for this structure. (The seeming agentivity is the result of having a human subject). The overt PP specifies the end-point of the progression (thus licensing the lower projection) and *run*'s M-PROG is interpreted as a modifier of the change. This modification adds to the basic interpretation, 'Jane got to the store', the restriction that the change of location event was rapid, yielding the interpretation, 'Jane got to the store in a rapid progression'.[20] We predict (and correctly), then, that such a sentence can

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[20] The backgrounded role of the progression means that the increments required for the interpretation of the *for*-adverbial with the change structure are not available (but see Erteschik-Shir and Rapoport (in preparation) for discussion of the ambiguity of such sentences).

mean that Jane got to the store by car (i.e. rapidly) (an interpretation even clearer in *She just ran to the store for a few minutes*). This quasi-idiomatic interpretation of *run* thus argues against other analyses such as that in Levin and Rapoport (1988), in which (36) is derived by subordination of the verb *run* by the PP, incorrectly restricting the interpretation to 'got to the store by running'.

A change interpretation is also possible even without an overt PP, under certain conditions (which hold of causatives too, as discussed below):

(37)   The ball rolled.

The V-P predicate of the change structure can be projected by the 'progression' of a M-PROG verb, given its 'path', and therefore prepositional, nature. Our system thus contains structures like that in (38).

(38)
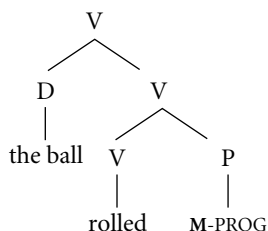
M-PROG verbs can thus project at least two different structure types, with a corresponding interpretational distinction: they may project the V-N of the activity structure, which focuses the manner of activity, or the V-P of the change structure, which focuses the (incremental) change of location.

The projection of change structures in this way is quite rare, though, because of the way the component must be interpreted. When the PROG part of M-PROG projects, the Manner, part of the predicate, is left uninterpreted. Since it is part of a projecting predicate, it cannot also function as a modifier of that predicate.

The option remaining is for Manner to be interpreted through identification with its subject. Such identification is possible here because it is a defining feature of balls that they progress in a rolling fashion. The interpretation of (38) is therefore 'The ball (which progresses by rolling) progressed (=changed location incrementally)'.[21] Another type of theme, i.e. one that is not inher-

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[21] Iwata (2002) analyses other uses of *roll* as well, among them (i) and (ii) (2002: 66, (9a, b)):

(i) Harry rolled the yarn into a ball.
(ii) Harry rolled the newspaper and put a rubber band around it.

ently rolling, will not allow such identification and will leave ᴍanner uninter-preted; this is what happens in the unacceptable *The box rolled.*

The structure in (38) has an atelic reading, as do other plural predicates, since ᴘʀᴏɢ does not have an understood end-point. This is shown in (39).

(39)   The ball rolled for an hour /*in an hour.

The ᴍanner identification we find in the atelic, PP-less sentences is not necessary, although nothing precludes it, in the parallel telic sentences with an overt PP:

(40)   The ball rolled into a ditch.

This sentence has the interpretation like that just discussed, i.e. 'The ball moved into a ditch in the round way that balls move'. And it can also be interpreted with the ᴍ-ᴘʀᴏɢ modifying the change predicate as in (36): 'The ball got into a ditch in a round progression.' There seems no significant distinction between these two interpretations.

The overt PP also allows even non-identifying themes in this structure, as shown in (41), since all that is required is that ᴍ-ᴘʀᴏɢ modify the change predicate:

(41)   The box rolled into the ditch.

We therefore predict the occurrence of a variety of cases, each with its particular interpretation and restriction. We turn now to a discussion of the transitive versions of such sentences, whose well-formedness we also predict.

4.4.3 *Transitives*

Consider the following:[22]

(42)   a. Jane rolled the ball.

      b. The officer marched the soldiers.

(43)   a. Jane ran Peter home.

      b. Jane rolled the ball into a ditch.

      c. The teacher marched the students to the principal's office.

This and similar examples are accounted for by associating the 'round' ᴍ with *the ball* or *the newspaper*. The overt PP containing the ball is not required, since yarn and newspapers are commonly known to form 'rolls', i.e. 'round' objects.

[22] Despite what is sometimes said (e.g. Levin and Rappaport-Hovav 1995) about manner-of-progression verbs, transitives are possible without an overt PP, although this is restricted by identification as discussed above.

The verbs heading these structures have the component ᴍ-ᴘʀᴏɢ. Under our analyses, such verbs project plural predicates in change structures. This plurality means that transitives of ᴍ-ᴘʀᴏɢ verbs should be acceptable, the upper causer having the interpretation of controlling the extent, or the increments, of the path of the theme's change of location. It turns out that various factors combine with this plural interpretation, yielding interesting results.

In the first set of sentences, (42), ᴍ-ᴘʀᴏɢ projects P and the theme identifies ᴍ, just as in the intransitive version of (42a). (42b) works the same: the theme *the soldiers* identifies the manner of *march*. This would not be possible with, for example, **Jane marched John.*[23]

The transitive is possible, as above, because the ᴍ-ᴘʀᴏɢ, which projects a plural predicate in the change structure, licenses the upper, cause projection through the interpretation of the causing event controlling the extent of the rolling/marching/running path.

When an overt PP projects, as in (43b), much the same interpretation can be derived. In fact, this is simply the plurality-licensed transitive version of (40), with the added interpretation that Jane controlled the path of the ball into the ditch (she decides its starting point, direction, velocity, etc.).[24]

Let us turn now to (43c), which has the structure in (44). Here the ᴍ-ᴘʀᴏɢ component modifies the lower projection. (ᴍ-ᴘʀᴏɢ cannot modify the cause projection, as would be expected of any other ᴍ component, because the type of manner, ᴘʀᴏɢ, is limited to modifying only change-of-location predicates; otherwise it is uninterpretable.)

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[23] The intransitive version of this sentence, i.e. a change interpretation for *The soldiers marched (to the compound)*, is not possible, because the verb *march* requires its theme subject to adapt itself agentively to some rhythm, resulting in conflicting interpretations. When the change is controlled by an upper causer, as in (42), that causer can force the theme to adapt to a rhythm, thus removing the theme's burden of agentivity.

[24] The types of ᴍ verbs (other than ᴍ-ᴘʀᴏɢ verbs) which cooccur with PP endpoints are severely restricted. Two examples are given in (i) and (ii):

 (i) John laughed the actors off the stage.

 (ii) John cut the vegetables into the pot.

In these cases the PP identifies the end-point of a path: in (i) the path is supplied by the progressing emission of sound (see Levin et al. (1997) for restrictions) and in (ii) the theme, in its cut state, provides a plural set (or path) of cut pieces (see Erteschik-Shir and Rapoport (in preparation) for details).

(44)

```
                    V
                  /   \
                 D     V  ←─────────────┐
                     /   \              │
                    V     V             │
                    |    / \            │
                 march  D   V (M-PROG)  │
                           /   \        │
                          V     P       │
                          |    / \      │
                       march  to the principal's office
```
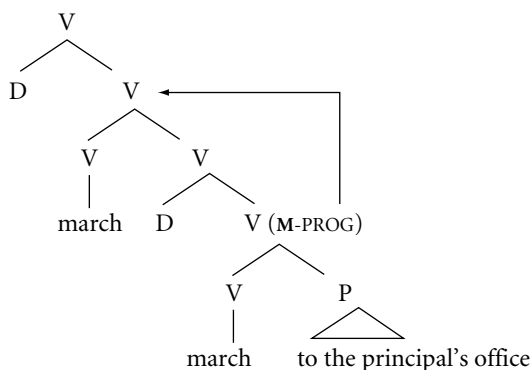
Here, too, the transitive is possible due to the progression in the change structure. The plural predicate gives the interpretation to the upper cause of path control, i.e. the teacher is interpreted as controlling the path of the students' marching to the principal's office. The additional understanding that the teacher accompanies the students and uses some force derives from the fact that the students must be progressing 'rhythmically', and the only way to keep them doing so (since they are not, after all, obedient soldiers) is by accompanying them with some measure of force. Thus the interpretation of (43c) is: 'The teacher caused the students to go (in a rhythmic progression) to the principal's office and the teacher controlled their path there.'

It is this combination of plural interpretation and real-world control that derives the interpretations for other verbs as well. Take (43a), *Jane ran Peter home,* for instance: the necessary 'driving' interpretation, i.e. that Jane drove Peter home in her car, derives from the fact that the sentence means that Jane caused Peter to go home and controlled his path there. The only way of Jane's both causing Peter to go home rapidly and having control over his rapid path is by her driving him there.

We find the same types of meaning with the verb *walk*, whose manner of progression is 'stepping'.

(45)   a. Jane walked Peter home.

   b. Jane walked the toddler around the room.

(45a) means that Jane controlled the increments of Peter's path home. The only way for Jane to do this is if she accompanies him along that route. This path-controlling and accompaniment mean that the sentence cannot mean simply that Jane caused Peter to go home. Rather, the sentence must, and does, mean: Jane caused Peter to go home, by stepping *with her*. The same type of

interpretation applies to (45b): the sentence means that Jane caused the toddler to progress, by stepping, around the room *with her*. (Additional understandings as to the relationship between them during this walking path are due to the fact that Jane is adult and toddlers walk with difficulty.)

The interpretation of the cause event, while involving a simple matter of path control, is thus also linked to a complex set of factors: real-world knowledge, the nature of the theme of the controlled change, its particular manner of progression, and the nature of the end-point of that progression.

4.5 Conclusion

We have identified a super-class of path predicates, and have offered an account of their possible syntactic structures and interpretations within a framework employing the lexical decomposition of a verb into meaning components that project and license syntactic structure.

Neither meaning components nor structures have a life of their own. Our use of Hale and Keyser's insight that meaning components are associated with lexical categories, together with the idea that they may or may not project but must always be interpreted, yields a system which restricts, in exactly the right way, the available structural alternations as well as the interpretations associated with them.

Part II

Event Structure and Feature Projections

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5

Tense, Person, and Transitivity

JACQUELINE GUÉRON

5.1 Introduction

5.1.1

In this work, I pursue a hypothesis introduced in Guéron (2000) and (2004) according to which each syntactic phase of the sentence (cf. Chomsky 1999*a*) is associated with a different type of interpretation. In the VP/vP phase, all interpretation is spatial: vP describes a configuration which relates objects in three-dimensional space. In the TP/CP phase, all interpretation is temporal: the situation vP describes is placed on the linear time axis. The Interface constraint in (20) requires these interpretations to be associated with the speaker's discourse world.

(1)   At the Interface of syntax and semantics, the situation the sentence describes is placed in the space and time intervals associated with the discourse world (or a world accessible to the discourse world).

5.1.2

Several grammatical phenomena argue in favour of distinguishing spatial construal in VP/vP from temporal construal in TP/CP.

5.1.2.1   A single lexical predicate may be associated with two distinct interpretations, invariably with a spatial interpretation in VP and a temporal interpretation in TP. In (2a), for example, the preposition *in* is construed as a spatial predicate which locates one three-dimensional object inside another. In (2b), the same preposition places an event at the boundary of a time interval.

(2)   a. John put the milk **in** the refrigerator.
       b. John will arrive **in** ten minutes.

Similarly, in (3a), the verb *have* denotes the inclusion of one object inside the contours defined by a larger object, while in (3b) the same verb inserts an event boundary in a time interval.

(3) a. John HAS [the book] (in his hand).

 b. John HAS [broken the tea pot].

Construal of a single lexical item as either a spatial or a temporal predicate is economical: it shifts the burden of interpretation from the lexicon to the computational mechanism. This economy would not be possible if the two interpretations interfered with each other. They cannot interfere, however, if, as we claim, lexical items systematically receive different interpretations in different syntactic domains.

The operation of VP deletion shows that the PP of (2a) is inside VP while that of (2b) is outside VP.

(4) a. John will put the milk in the refrigerator

 *and Mary will——on the table.

 b. John will arrive in ten minutes

 and Mary will——in twenty minutes.

And verb raising to Tense over an intervening negation shows that *have* is construed in VP (at least in American English) in (3a) but in TP in (3b).

(5) a. ?* John hasn't the book (in his hand).

 b. John hasn't broken the tea pot.

5.1.2.2   A nominal which raises from the vP domain to the TP domain accumulates the interpretations it receives in each. It is when a nominal occurs only in one domain or the other that we can see that it is selected for different properties in each of them. A nominal which occurs only in vP is selected for its spatial properties, like *milk* or *refrigerator* in (2), while a nominal which occurs only in TP has no spatial properties at all. For example, Romance, Germanic, Slavic, Semitic, and other language families possess a dative argument which is not selected by the verb, is underdetermined for the phi features (Fs) of number and gender which denote physical properties, but always has a person F. As the name usually given to this argument—'Benefactive' or 'Experiencer'—suggests, it has only psychological properties.

(6) Marie (lui) a pris son livre (à Jean).

 Mary (him) took his book (to Jean).

 (Mary took his book off John.)

5.1.2.3   Adverbials, which we assume to remain in situ throughout a derivation, indicate syntactic levels of construal (cf. Cinque 1999). The hypothesis that instrument and effort adverbials identify the vP level, while purpose adverbials identify the TP level accounts for the obligatory ordering of the adverbials in (7): the instrument or effort adverb is closer to the verb phrase than is the purpose adverb, as follows from a structure in which TP is higher than vP.

(7)   a.   John put the milk in the refrigerator (with difficulty/ with his left hand).

      b.   John put the milk in the refrigerator (so that it wouldn't spoil).

      c.   John put the milk in the refrigerator (with difficulty/ with his left hand) (so that it wouldn't spoil).

      d.   *John put the milk in the refrigerator (so that it wouldn't spoil) (with difficulty/ with his left hand).

5.2   Deriving spatial and temporal construals

5.2.1

I propose that spatial interpretation in VP/vp and temporal interpretation in TP/CP is based on a single Formal Feature of lexical items. More precisely, every lexical item bears an abstract number feature [+/− plural] construed as an Aktionsart (Akt) feature [+/− EXT(ended)] which translates lexical content in terms of extension in space or time. In vP, a verb or preposition with a [+pl]/[+EXT] Akt F defines a situation which extends in space, while a predicate with a [−pl]/[−EXT] Akt F defines a situation located on a point in space. Verbs like *swim* or *write* have a [+pl]/ [+EXT] Akt F because they denote a plurality of physical gestures; verbs like *sit* or *lie* have a [+pl]/ [+EXT] Akt F because they denote a plurality of points in space. A verb with a [−pl]/[−EXT] Akt F, such as *notice*, *arrive,* or *know*, defines a situation placed on a single point in space.

   While V and P may have a [+EXT] or a [−EXT] Akt F, all nominals have a [+EXT] Akt F. A nominal inherently defines a space within the discourse world over which its referent extends: this is a physical space for 'book', a mental space for 'idea', and a psychological space for 'love', for example.

   Following Verkuyl's (1972) discussion of the temporal content of VP, which I translate as *spatial* content, I assume that a complex VP has a derived Akt F obtained by calculating the values of the lexical predicates it contains.

On the TP level, where v+V are merged with T by movement or construal, a vP with a [+EXT] Akt F defines a situation which extends in time, while a vP with a [−EXT] Akt F defines a situation located on a point of time. A swimming event is here construed as extended in time as well as in space (*John swam for hours*) while an arrival event is placed on a point in time as well as in space (*John arrived at ten o'clock*).

5.2.2

I propose that the lexical material in vP and TP is organized and placed in space and time by an external argument located at the periphery of each syntactic phase.

5.2.2.1   A VP with a [+pl]/[+EXT] akt F selects a nominal in Spec vP which checks its abstract [+pl]/[+EXT] F akt F with the abstract [+pl.] nb. F of v.[1] This nominal plays the role of a purely spatial subject: it is construed as a body which delimits the physical extension of the configuration VP denotes and which anchors it in the discourse space. If VP is complex, i.e. if it describes a series of gestures or the change of place of an object, then the subject in Spec vP also functions as a Manipulator. With the aid of an Instrument, often its body part, the Manipulator effects the spatial configuration VP describes. Thus, the VP in (8a) selects a Manipulator in Spec vP in (8b) whose arm is the instrument which effects the putting event.

(8)   a. [VP put [PP the milk in the refrigerator]]
      b. [vP John [VP put [PP the milk in the refrigerator]]]

In (8b) the Manipulator argument, John, is overt, while the Instrument, his arm, is covert. In (9a), both Manipulator and Instrument are overt. In (9b), the instrument appears in Spec vP while the Manipulator is implied by the conceptually based construal mechanism of metonymy.

(9)   a. [vP John [VP opened the door with the key]]
      b. [vP the key [VP opened the door]]

A VP with a [−EXT] Akt F does not select a subject in Spec vP, for it defines no complex spatial configuration which needs a subject to delimit it and no gestures which a body part or other Instrument must effect. The VP in (10)

---

[1] The abstract [+pl.] nb. F construed as an Aktionsart F is not to be confused with the [+pl.] phi F of a nominal. The Akt F determines whether the nominal takes up space, not whether it refers to more than one individual.

describes a punctual contact between a Figure (*quelqu'un*) and the deictic Ground implied by the verb *arriver*.

(10)   [VP arrive quelqu'un]

I claim that auxiliary selection is determined by the presence or absence of a Manipulator in Spec vP. A [+EXT] vP with an external spatial argument selects auxiliary *have* while a [−EXT] VP with no argument in Spec vP selects *be*.

(11)   a.   Jean/La clé **a** ouvert la porte.

(John/The key has opened the door.)

b.   Il **est** venu quelqu'un.

(It is arrived someone—someone has arrived.)

5.2.2.2   When V + v merge with T in the TP domain, the situation vP describes is placed in the time interval which T denotes. A vP with a [+EXT] Akt F selects an external argument in Spec TP which checks its temporal feature with the tense F of T. Lecarme (1996; 2004) shows that D can contain a morphological tense feature in Somali. More often, I propose, the person feature of a nominal functions as its tense feature. When D checks a person F with the tense F of T, the DP it heads is selected for the minimal temporal properties necessary to satisfy (1). DP is assigned a biography which situates it in the Reference time interval associated with the CP domain, which includes the Event time interval associated with T. The DP is also selected for psychological properties which allow it to place an event in time, in particular the property of intension, which enables it to function as Trigger of the Event and as the T(ense)-Controller which maintains the event in time. Just as a nominal which checks an abstract [+pl] Akt F in Spec vP anchors the configuration VP denotes in space, so a nominal which checks a [+person] temporal F in Spec TP anchors the event vP denotes in time. The psychological properties of the T-controller may be likened to the Instrument of the Manipulator: they effect the organization of material in time as the Instrument organizes it in space.

An external argument is selected for properties determined both by the lexical content of the predicate and by its own syntactic position. Only an argument which takes scope over VP can be construed as Manipulator, and only an argument which takes scope over T can be construed as Trigger and T-controller of the event.

A second argument checks person in T. This is the Experiencer, which, in the languages cited in 5.1.2.2. above, raises to T from a high v projection.

Because the Experiencer argument lacks the high syntactic scope needed to function as Trigger and T-controller of the event, it is not selected for the intentional property which underlies these functions. However, when it checks its person F in T, the Experiencer nevertheless acquires temporal properties, a biography which places it in the time of the discourse world previous to the event time, and the minimal psychological property of perceptiveness. The Experiencer functions as a specific kind of T-controller: it maintains an event in time by perceiving it. An event which does not take up time cannot license an Experiencer argument.

(12)   a.   Marie lui prend son livre.

> (Marie him takes his book.)

   b.   *Marie lui admire son livre.

> (Marie him admires his book.)

   c.   *Marie lui connaît son livre.

> (Marie him knows his book.)

5.2.2.3   Spatial and temporal arguments may be overt or covert. In the English middle structure in (13a), the Manipulator argument is implied by the [+EXT] Akt F of the verb and focused by an effort adverbial; in the reflexive structure in (13b), it is selected by the gestures defining the [+EXT] predicate. A [−EXT] predicate does not select a Manipulator.

(13)   a.   (i)   This book reads easily.

   (ii)   *This book finds easily.

   b.   (i)   John washed (himself).

   (ii)   John saw *(himself) in the mirror.

We suggest, for concreteness, that English has a strong [+pl] F in v which can license a covert Manipulator, just as many Romance languages have a strong Tense or Person F in T which can license a pro or covert T-controller.

   The covert external argument in the passive participle in (14) is construed as a Manipulator when the by-phrase is construed in spatial terms in vP, and as a Trigger and T-controller when it is construed in temporal terms in TP.

   (14)   John was beaten (by Bill).

   A temporal argument may not be covert in a finite sentence, however. As the contrast between French (15a), where a **se** morpheme bears the person F, and English (15b), which lacks such a morpheme, shows, a purpose adverbial

cannot compensate for the absence of a morpheme with a person F functioning as T-controller of the event.

(15)   a.   Ce livre **se** lit (pour accumuler les connaissances).

       b.   *This book reads (in order to accumulate knowledge).

5.2.3

I thus eliminate holistic theta-role features assigned to a predicate in the lexicon, which select an Agent or a Patient argument in syntax, in favour of fragmentary event functions or roles which select an argument in one or more syntactic phases. Aktionsart functions like Manipulator are assigned in VP or vP, while aspectual functions like Trigger, T-controller, and Experiencer are assigned in TP. These event roles are required by Constraint (1) to mediate between the description of an event and the placing of the event in discourse space and time. As these roles are predictable from the Akt F of the lexical predicate as it is construed in each syntactic phase, they need not, and cannot, be listed in the verb's lexical entry.

It is important to point out that the fragmentary event roles I posit are empirically superior to holistic theta-roles. The theta-role Agent combines three elementary event functions—those of Manipulator, Trigger, and T-controller—each of which is assigned in different syntactic contexts and can occur independently of the others.

For example, the English middle in (13a) selects only a Manipulator in vP, while the French middle in (15a) selects a Trigger and a T-controller as well. However, if the tense is episodic rather than generic, in French the verb can assign only a Trigger function to the **se** morpheme, while in Spanish, it can assign the T-controller function as well, as the contrast between (16b) and (17b) shows.

(16)   a.   Cela s'est dit hier. (*Trigger*)

            (That self said yesterday—that was said yesterday.)

       b.   *Les pommes se sont mangées hier. (*T-controller*)

            (The apples self ate yesterday—the apples were eaten yesterday.)

(17)   a.   Este se dijo ayer. (*Trigger*)

            This SELF said yesterday.

            'This was said yesterday.'

       b.   Las manzanas se comieron ayer. (*T-controller*)

            The apples SELF ate yesterday.

            'The apples were eaten yesterday.'

If the **se** morpheme in (17b) is associated with the theta-role Agent, what should we call the **se** morpheme in (16a) and (17a)? And what theta-role does the implicit subject have in English (13a(i))? There is no conceptual problem if Agent is simply an umbrella term for a syntactic argument which receives the three fragmented event roles which the subject of different syntactic domains may assume.

Similarly, causative *make*, which has a [−EXT] Akt F, can assign the Trigger function, but not the T-controller function, to its subject. But causative *have*, which has a [+EXT] Akt F, assigns the T-controller role in the same context which can only be satisfied by a human subject which checks its person F in Spec TP.

(18)   a.   John made [Mary fix the sink].

| [−EXT] |

Trigger Manipulator

b.   The bad weather made Mary change her plans.

(19)   a.   John had Mary fix the sink.

| [+EXT] |

T-controller Manipulator

b.   *The bad weather had Mary change her plans.

5.3 Activities, accomplishments, achievements, and states

In this section, we show how the Interface constraint in (20) determines the valence of a verb, and how spatial construal in vP interacts with temporal construal in TP.

(20)   vP must define a spatial Figure-Ground configuration.

5.3.1 *Activities.*

The verb *swim* has a [+EXT] Akt F based on its lexical content: swimming implies gestures effected by the arms, legs, and torso of a swimmer, which constitute the FIGURE of a spatial configuration. As *swim* implies the water which functions as GROUND, its FIGURE–GROUND configuration is complete without a direct object in VP.

In (21), the [+EXT] Akt F of *swim* selects a spatial subject, *John*, in Spec vP which checks its [+pl.] Akt F with the [+pl.] abstract number F in v. *John* is

construed as a body which delimits the swimming configuration and whose body-parts function as the Instrument which realizes it.

When *John* raises to Spec TP to check its person F with the tense morpheme in T, it is assigned an internal temporality, or biography, included in the discourse reference time interval and the psychological properties of intentionality and will which allow it to function as Trigger and T-controller of the event.

At the Interface, the event vP describes is inserted in the time interval denoted by T: every sub-event *e* of the swimming event is predicated of one point *t* of the time interval.

(21)   John swam

```
                    TP
                  /    \
               Spec    T'
                |     /   \
                |    T     vP
                |    |    /  \
                |  past Spec   v'
                |         |   /   \
                |         |  v     vP
                |         |  |      |
                |         | +pl     V
                |         |         |
              John     John       swim
              pers     +pl       +EXT
                t t t t    e e e e
```
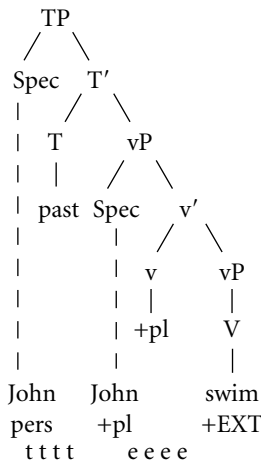
5.3.2 *Accomplishments*

The verb *read* has a [+EXT] Akt F: reading consists of a plurality of gestures with the eyes, hands, and brain which constitute the FIGURE of a spatial configuration. The GROUND of the reading activity is, implicitly, printed matter, so the direct object is not strictly necessary; in (22), it merely restricts the GROUND.

The [+pl] Akt Fs of the subject and direct object are both checked with the [+pl] F of v by movement or by agreement (cf. Chomsky 1998). *John* in spec vP delimits the spatial configuration and functions as its Manipulator. When *John* raises from Spec vP to Spec TP to check its person F, it is assigned the event roles of Trigger and T-controller of the event.

(22)   John read a book

```
                        TP
                      /   \
                  Spec     T′
                   |      /  \
                   |     T    vP
                   |     |   /  \
                   |   past Spec  v′
                   |     |    |  /  \
                   |     |    | v    VP
                   |     |    | |   /  \
                   |     |   +pl. V    DP
                   |     |    |   |    |
                  John  John  read a book
                  +pers +pl. +EXT +pl.
```
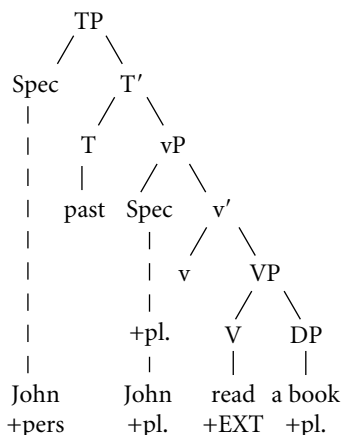
So far, we have not assigned an event function to the direct object. Tenny (1987) proposed that the direct object measures the time of the event. For example, in *John ate an apple*, the event lasts until the apple is completely eaten. Similarly, Verkuyl (1972) pointed out that it takes longer for John to *write a letter* to the President than to *write the letter* A.

In our framework the direct object cannot measure time, for it is construed in VP, where temporal construal is not relevant. The direct object measures, rather, the effort, calculated in terms of the force and number of gestures which the subject of vP must supply in order to realize the spatial configuration VP defines.

It does not, in fact, necessarily take more time to write a letter to the President than to write the letter A. This depends on circumstances, mainly on the will of the writer. But it does require more effort, measured in the number of gestures, to write a letter to the President than to write the letter A.

Moreover, there exist verbs which select an external argument solely on the basis of the effort needed to realize the event the sentence denotes, but without limiting the time spent on the effort.

(23)   a. This book reads easily (even though it's taking me a long time to get through it).

   b. John is easy to like (if you take the time to get to know him).

   c. I didn't manage to/couldn't open the door (no matter how long I tried).

But there do not seem to be any predicates which select an event which can be completed in a long or short time.

(24)　a. *This book reads rapidly/in two days.

　　　b. *John is quick to like.

　　　c. *I quicked/dawdled to open the door.

　Such data, if verified by further research, support the hypothesis that temporal duration is not pertinent in the vP domain in which V selects its arguments.

　As with duration, so for telicity. While a configuration with verb and direct object can be bounded in the deictic discourse space by the delimiting function of the definite or demonstrative determiner of the direct object, the temporal duration of the event denoted by the sentence may extend as long as the lifetime of its subject.

(25)　a. John read this Bible all his life (without finishing it).

　　　b. Sisyphus will roll the rock up the hill eternally.

5.3.3 *Achievements*

5.3.3.1　*Unaccusative achievements* Unaccusative verbs have a [−EXT] Akt F: the VP denotes a spatial configuration situated on a point in space in vP and an event located on a point of time in TP. This simple configuration selects no Manipulator argument in Spec vP— it thus takes auxiliary *be* in alternating languages—and no T-controller in Spec TP. In (26), the VP headed by the [−EXT] verb *arrive* denotes the punctual interaction of a Figure with the implied deictic GROUND.

(26)　Il arrive/ est arrivé quelqu'un.

　　　(It arrives/ is arrived someone.)
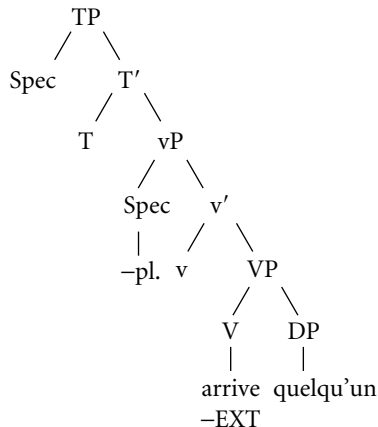
This analysis is not quite satisfactory, however. If the event in (26) were really punctual, (27a) would be ungrammatical, like (27b, c), for a punctual event cannot be placed in the present time interval.

(27)   a.   Jean arrive.

         (John is arriving.)

       b.   *Je trouve une pièce.

         (I find a coin.)

       c.   *Je frappe Pierre. (* if semelfactive)

         (I hit Pierre.)

The progressive interpretation of (27a) suggests that although the event occurs on a point of space in vP and on a point of time in TP, there is a still higher syntactic domain in which the event describes a spatio-temporal trajectory. This is the CP domain, where the event time and space in TP are associated with the reference time and space in CP.

Unaccusative verbs are oriented towards or away from the deictic centre of utterance (cf. Bouchard 1993). We propose that at the CP level of construal, such verbs imply a trajectory in the discourse space. If we assume that any trajectory in space is construed as a temporal trajectory as well, then we can understand why imperfective aspect is grammatical in (27a), which implies a trajectory towards the deictic centre, but not in (27b) and (27c), which do not.

A temporally extended event selects a T-controller. For an event construed as extended in time on the CP level, the only available T-controller is the speaker. The speaker does not trigger the event but s/he controls it in time by perceiving it.

The Speaker, like an Experiencer, is the 'innocent bystander' who situates an action in time by perceiving it as it unfolds.[2] However, the Speaker has an advantage over the Experiencer in that s/he inserts the event in the discourse world by narrating it.

5.3.3.2 *Transitive achievements*   The transitive semelfactive achievement in (28) is paradoxical: the event occurs on a point of space and time, yet it selects a Manipulator and T-controller subject.

(28)   John hit Bill.

---

[2] C. Chvany, in an article for which I have unfortunately forgotten the reference, affirms, with respect to the dative argument in Russian, that 'there is no innocent bystander'. We may indeed take conscious perception of the event the vP denotes as a sign of complicity.

Unlike an arrival event, a hitting event does not describe a trajectory towards or away from the discourse centre. Thus, it cannot be predicated of an imperfective tense, as shown in (27).

We attribute the contrast in valence between verbs like *arriver* and verbs like *hit* not to the absence of a spatial trajectory but to the nature of the space on which the trajectory is defined. While the verb *arriver* describes the spatial intersection of an entire FIGURE with the discourse GROUND, which the speaker witnesses, the verb *hit* describes only a partial intersection: when John hits Bill it is not all of John but only his hand, or an instrument held in his hand, which intersects with the body of Bill. An Instrument lacks the spatial and temporal independence necessary to place an event in space and time. Thus, we must say (28) and cannot say, if the event is intentional, (28′).

(28′)   *John's hand hit Bill.

Nor can the speaker place the event in (28) in space and time, by locality, for the possessor of the body intervenes between the speaker and the instrumental hand. So whenever VP describes the intersection of a body-part and a body, only the inalienable possessor of the body-part may function as the spatial delimiter of the configuration in VP and the Manipulator which effects the action VP describes. (29) denotes a spatial trajectory initiated by John's hand and bounded by a part of Bill's body.

(29)   John hit Bill.
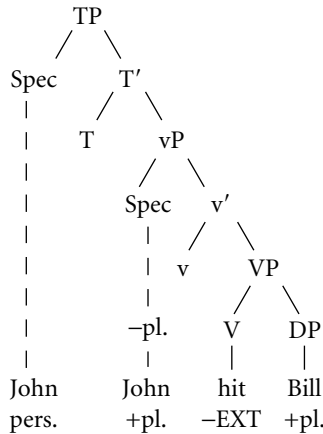
This spatial trajectory is construed in TP as a temporal trajectory controlled by a T-controller selected for the psychological property of intention. (29) implies that the subject in Spec TP intended the hitting event and targeted its goal, Bill, before the event.

But suppose John hit Bill unintentionally—say, as he fell from a ladder under which Bill was standing? Such sentences are derived when the subject lacks a person F, as in (30), or does not check its person F in T in a sentence like (28).

(30)   The bullet hit Bill.

A subject which checks its number/Akt F in vP but not a person F in TP is construed at the Interface as a body; it lacks the psychological property of intention which underlies the Trigger and T-controller functions. The implicit spatio-temporal trajectory the sentence describes is placed in time not by its subject but, as with unaccusative sentences, by the speaker/narrator.

5.3.4 *States*

Stative verbs have a [−EXT] Akt F. They select neither a Manipulator in Spec vp nor a T-controller in Spec TP. I suggest that states satisfy (1) by projecting the FIGURE/GROUND configuration defined in vP onto the TP level.

More precisely, the subject of a stative sentence functions as a Spatio-temporal Ground in which its predicate, construed as a FIGURE, is inserted. In (31), the stage-level predicate 'be hungry' or 'be high' is asserted to be a property of the subject's space at the speech time. In (32), an individual-level predicate 'be tall' or 'be high' is asserted to hold of all stages of the subject's space/time (see Carlson 1977).

(31)   a. John is hungry.
        b. The sun is high in the sky.

(32)   a. John is tall.
        b. The building is tall.

In (33) the subject is the locative pronoun *there*, which denotes the discourse space into which a FIGURE, the body of a man, is inserted at the utterance time. The PP *in the room*/*dans la pièce* restricts the discourse space.

(33)   a. There is a man in the room.
        b. Il y a un homme dans la pièce.

When a [+EXT] verb like *have* substitutes for [−EXT] *be*, and the tense is episodic, then the verb selects a subject which functions not only as the GROUND in which a FIGURE is inserted but also as an individual with a biography which maintains the configuration over time. In other words, while

[−EXT] *be* does not contribute to the temporal construal of the VP which contains it, [+EXT] *have* does.

Just as the theta-role Agent is an umbrella term for an argument which combines the elementary event roles of Manipulator, Trigger, and T-Controller, the Possessor theta-role is an umbrella term for an argument which combines the elementary functions of Spatial Ground, assigned in vP, and T-controller, assigned in TP.

(34) a. John has a new baby brother.

   b. John has Bill's book.

A [+hu] nominal which does not check a person F, as in (33a, b) above, is construed as a body or location in space rather than as a person reacting in time. Checking of a person F suffices to distinguish a location from a person with the *ci* morpheme in Italian.

Russian distinguishes the spatial and psychological construals of a [+hu] nominal by case-marking. In the inalienable possession structures in (35) and (36), *y*+Gen identifies a [+human] argument as a location, while dative marking identifies the same nominal as an experiencer (Paykin and van Peteghem 2003).

(35) Devka razorvem   tebe   /y tebya   serbtze
      The girl will tear apart   you-dat/at you+gen heart
      (The girl will tear your heart apart.)

(36) Veter trepal emy   / y nevo   golosi na golove.
      The wind blew him-dat/to him-gen hair   on head.
      (The wind was blowing his hair on his head.)

Paykin and van Peteghem suggest that the [+hu] argument is assigned different theta-roles, Goal or Experiencer, in such contexts. In our framework, the semantic difference in the construal of the argument reduces to a morphosyntactic difference. I propose that when a locative P lacking a Tense or person F, like Russian *y* or the incorporated P in English *there*, case-marks a nominal it blocks its access to T in TP. Consequently, the nominal cannot check its person F in Spec TP and is construed as a location, even if it has a lexical +hu Feature. A dative argument, on the contrary, in Russian as in French, checks a person F in T and is assigned the psychological properties of the Experiencer.

5.4 Two types of transitivity

5.4.1 *Distinguishing spatial from temporal/personal transitivity*

I claim that transitivity relations are defined not (necessarily) on syntactic arguments, but on the abstract number and person Fs of syntactic arguments. Spatial transitivity links the number/Akt Fs and, by metonymy, the spatial arguments which check number in the vP domain. Person transitivity links the person Fs and, by metonymy, the individuals bearing these Fs, in the TP/CP domain. Crucially, these relations are independent. Only a spatial relation obtains between *milk* and *refrigerator* in (2). And only a person-to-person relation obtains between speaker and addressee in an imperative sentence like *Leave now!* or between subject and benefactive in *Je lui ai pris sa poupée* (I took to her her doll).

Inalienable possession structures like (37), analysed in Guéron (2003) and earlier work, illustrate both the independence of spatial transitivity in vP and temporal transitivity in TP and the manner in which the grammar integrates these relations at the interface. The structure in (38) defines a spatial contact between two bodies in VP and a person-to-person relation independent of physical contact in TP.

(37) Je lui prends la main (à Jean).

  (I him take the hand (to Jean).

(38)

```
                    TP
                  /    \
               Spec     T'
                |      /   \
                |     T     vP
                |     |    /  \
                |     |  Spec   v'
                |     |   |    /  \
                |     |   |   v    VP
                |     |   |   |   /  \
                |     |   |   |  V    PP
                |     |   |   |  |   /  \
                |     |   |   |  | spec  P'
                |     |   |   |  |  |   /  \
                |     |   |   |  |  |  P    DP
                |     |   |   |  |  |  |   /  \
                |     |   |   |  |  |  |  D    NP
                |     |   |   |  |  |  |  |    |
               Je   T lui je prends pro (a)  la   main
              pers  pers_i    instr. body          body
```
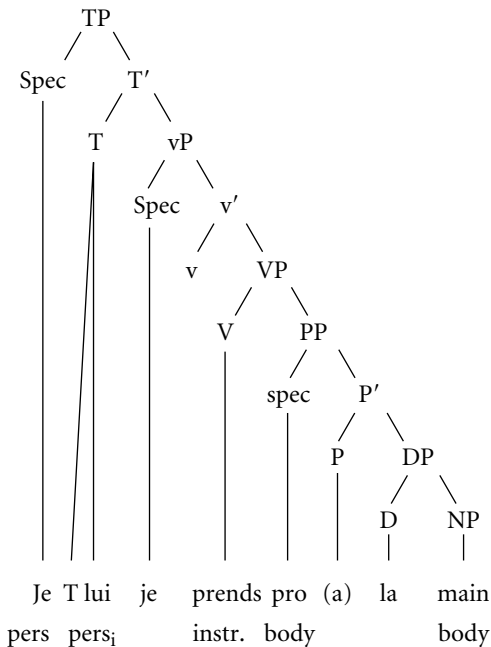
In (38), VP contains a PP small clause which defines a spatial configuration of inclusion of a body part, *la main*, inside the contours of the body represented by pro in Spec PP. Both arguments check a +pl. nb/Akt F in vP. VP selects a Manipulator argument, *je*, in Spec vP, whose hand is the instrument which enters into a physical contact with the direct object, *la main*.

In the TP domain, an unselected dative clitic, *lui*, checks its person F with T. It thus acquires temporal properties, a biography included in the reference time of the sentence, and the psychological property of perception. When *je* raises to Spec TP, it also checks its person F with the tense morpheme in T and acquires a biography included in the same discourse time interval as *lui*.

The biographies of *je* and *lui* thus overlap in time. Their different syntactic positions determine the selection of different psychological properties, however. Because *je* in Spec TP takes scope over T, it can be selected for the dynamic intentional property necessary to exercise the Trigger and T-controller event functions. *Lui*, which does not take scope over T, is selected for the non-dynamic psychological properties of perception and consciousness.

The distinction in their psychological properties implies a semantic asymmetry in the relation between the two [+person] arguments. When the hand of *je* takes the hand of *lui*, accomplishing a purely spatial action in vP, *je* also targets *lui* psychologically in the TP domain, initiating an intentional person-to-person relation. The inalienable possession construal is not in fact successful unless the sentence denotes an action imposed by the subject on the direct or indirect object.

(39) a. I hit John in the eye.

b. *I saw John in the eye.

(vs. idiomatic 'I looked John in the eye'.)

(40) a. *Marie lui a longtemps admiré les yeux.

(Mary to him admired the eyes for a long time.)

b. Le médecin lui a longuement examiné le coeur.

(The doctor to him examined at length the heart.)

(41) a. *Je lui ai vu les yeux.

b. Ha! Je lui ai vu les jambes.

(I to-her looked-at the eyes/the legs.)

5.4.2 *Unifying spatial and temporal/personal transitivity relations*

Spatial transitivity, the intersection of two bodies, is defined only for nominals which check a [+pl/+EXT] Akt F in vP, while personal transitivity, the

intersection of two conscious minds, is defined only for nominals which check a person F in TP.

I assume that fragmentary event roles and feature transitivity relations must be harmoniously integrated at the Interface to satisfy (1). If sentences like (38) do not suffer schizophrenic collapse at this level, it is because various construal mechanisms are available to unify the partial interpretations derived in each syntactic phase.

5.4.2.1   One such mechanism is the construal of a moved element and its trace as a single argument chain which merges the event functions assigned to its disjoint links.

5.4.2.2   Another construal mechanism is metonymy, under which the whole implies its part, so that you can truly affirm that '*John kissed Mary*' even when only John's lips came in contact with Mary's body (example provided by Dick Carter), or the part implies the whole, so that you can truly affirm that a key, rather than the person manipulating it, opened the door.

5.4.2.3   A third unifying mechanism is A-binding, which creates not an argument chain but a feature chain between two syntactic arguments. This chain allows a single semantic participant of the event to be spread out in time and space, with each of its spatial or temporal instantiations assigned a distinct event function.

5.4.2.3.1.   Consider the reflexive structure (42) (where prefixed i indicates an interpretable FF, prefixed u an uninterpretable one).

(42)   John washed himself.

```
                         TP
                        /  \
                    Spec    T′
                     |     /  \
                     |    T    vP
                     |    |   /  \
                     |    | Spec  v′
                     |    |  |   / \
                     |    |  |  v   VP
                     |    |  |     /  \
                     |    | +pl   V    DP
                   John  Past John wash  him + SELF
                   ipersᵢ     upersᵢ     upers body
                              inb/gⱼ     unb/gⱼ
```

$John$ $ipers_i$

$Past$

$John$ $upers_i$ inb/g_j

$wash$

$him + SELF$ $upers$ body unb/g_j
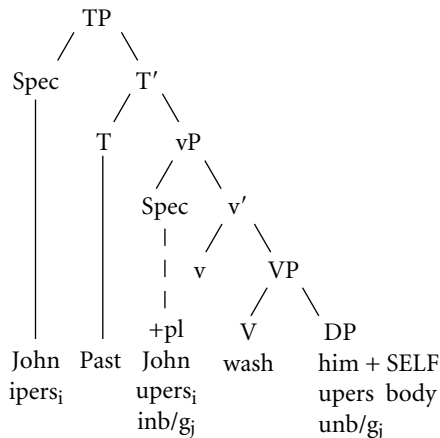
In (42), *himself* denotes a body; in some languages, *self* is replaced by a body-part noun such as *head*. The prefix of the anaphor contains uninterpretable phi Fs for person, number, and gender (where 'uninterpretable' does not mean 'unvalued' but, rather, non-referential because unchecked). The direct object denotes a body which measures the spatial extension of the washing configuration, determining the effort needed to realize it: if the body is tall or fat, more or more vigorous gestures are needed.

John in Spec vP checks its [+pl] Akt F with the [+pl] Akt F of v. *John* denotes the body which delimits the washing configuration in space and the Manipulator whose hands realize it. We identify an interpretable phi F as one which is checked in vP or TP. In (42), the interpretable number and gender phi Fs of *John* checked in spec vP bind the uninterpretable number and gender Fs of *himself*, identifying the body of John as Manipulator with the body being manipulated.

When *John* raises to Spec TP, it checks its interpretable person F and functions as Trigger and T-controller of the event. The interpretable person F of *John* in Spec TP binds the uninterpretable pers. F of *John* in Spec vP, identifying the Manipulator as the same individual as the Trigger and T-controller, in spite of their overlapping rather than merged event functions.

John in Spec vP may be considered the pivot of the sentence: it is construed as a person because it is part of the chain with the subject in Spec vP and its person F is bound by that of the higher subject; it is also a body whose number and gender phi Fs bind those of *him*self, allowing it to assume the partially distinct spatial functions of Manipulator and manipulated body.

5.4.2.3.2.   Under logophoric binding, a referential argument can bind a reflexive nominal non-locally or in the absence of a c-command relation between the antecedent and the anaphor, as in (43). Crucially, the binder is a 'subject of consciousness' (Zribi-Hertz 1989; Sells 1987; Landau 2000; Bianchi 2004).

(43)   Those pictures of himself annoy/embarrass/delight John.

I suggest that logophoric binding reduces to person F transitivity in the absence of number F/spatial transitivity. Spatial contact is not relevant when the verb defines, not a physical space which contains the event participants, like that defined by *hit* or *run*, but a psychological space internal to a single participant. In such 'psych' sentences, an Experiencer argument generated inside rather than outside VP both defines the physical space in which the event takes place and functions as T-controller of a spatio-temporal trajectory. This acrobatic feat clearly cannot take place in ordinary physical space.

The sentences of (43) describe a special kind of spatio-temporal trajectory, one in which a sense perception—here, the perception of pictures—is transformed into an emotion within the space and time internal to the Experiencer.

Let us assume (44).

(44)   a. An interpretable person F can bind any uninterpretable person F in its scope.

   b. The scope of a person Feature is defined by the highest syntactic head of the T(ense)-chain in which it checks its person F (for T-chain, see Guéron & Hoekstra 1988).

I propose that in (45) below, the psych verb *please* contains a lexical person F. The verb checks its person F by raising to a high v node which merges with T in Logical Form within a T-chain. The direct object *John* raises to the Spec position of this same v node where it checks both its number/Akt F and its person F. The direct object is consequently construed as an Experiencer argument whose person F can bind any uninterpretable person F in the sentence. The direct object, whether it be *pictures of himself* or e.g. *Mary*, raises to Spec TP but checks no person F.

(45)   Those pictures of himself please John.
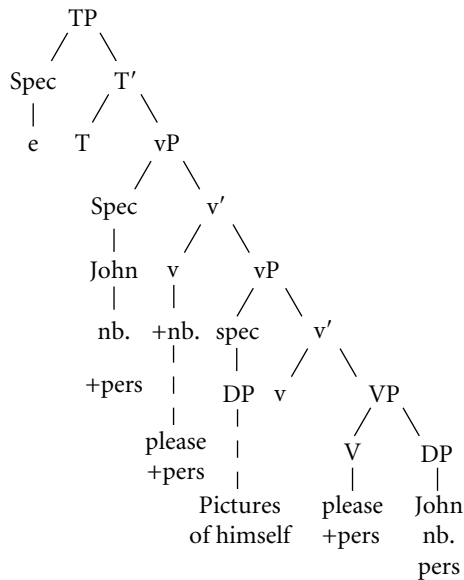
The psychological trajectory which (47) describes does not count as an event but, rather, as a state, in physical space. However, it does describe an event, a change of state triggered by a mental image and bounded by an

emotion, in psychological space. The two spaces are compatible by transitivity of inclusion: physical space includes an Experiencer participant which in turn contains a psychological space.

A purely spatial object which does not imply a mental perception does not trigger the trajectory.

(46)   *That bug on himself annoys John.

If the time of the event is not controlled by the Experiencer, but by someone else, as in (47b), or by the speaker, as in (48b) and (49b), the sentence is ruled out.[3]

(47)   a.   Those pictures of himself tickle John's fancy.

     b.   *Those pictures of himself please John's mother.

(48)   a.   That picture of himself doesn't please John.

     b.   *That picture of himself doesn't resemble John.

(49)   a.   Those pictures of himself make John feel ridiculous.[4]

     b.   *Those pictures of himself make John look ridiculous.

It is the perception of the pictures that affects John, not their physical properties.

(50)   a.   That book about himself annoys John.

     b.   ?*That bulky/red book about himself annoys John.

The cause of John's emotional state at T is included in his psychological space but subsequent events are not. (51a) is acceptable (under the construal that someone else than John took the pictures) but not (51b).

(51)   a.   Those pictures of himself made John happy.

     b.   *Those pictures of himself made John a laughing-stock.

Person binding can occur when the binder nominal is embedded in a larger nominal denoting one of the personal attributes of the Experiencer as in (52a), but not in one denoting a physical object as in (52b) (see Landau 2000).

(52)   a.   Those pictures of himself destroyed John's reputation.

     b.   *Those pictures of himself ruined John's camera.

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[3] So far our description of the internal psych domain is equivalent to the Internal Logophoric Center of Bianchi (2003). The analyses differ with respect to (54) and (56) below.

[4] In (49a), the Experiencer, John, is located in a position lower than that of the subject. But as *make* is part of the T-chain with which the trajectory leading from image to emotion is associated, the subject is in the scope of the Experiencer.

The SELF expression must be situated in a psychological space. To talk about someone, like pictures of someone, creates a perceived image of reality, but to wash someone or talk to someone occurs solely in physical space.

(53) a. John wondered whether Sue and Bill were intending to talk about himself.

   b. *John wondered whether Sue and Bill were intending to wash himself/talk to himself.

A problem for accounts of logophoricity based on the semantic notion of subject of consciousness, which turns out not to be a problem for our morphosyntactic account based on person F binding, is the fact that logophoric binding can occur within a purely physical space.

(54)   Pictures of himself hang on John's walls.

The contrast between (54) and (56) vs. (55) suggests that the morpheme *s* plays a crucial role in such sentences.

(55)   *Pictures of himself are hanging on the walls of John.

(56)   Pictures of himself are hanging on those walls of John's.

Inspired by Lecarme's (2004) demonstration that D contains tense morphemes identical to those found in T in Somali, and in a spirit similar to Pesetsky and Torrego's (2001) proposal that Case is an uninterpretable tense F in D, we propose that a checked person F functions as the visibility of tense in DP. (Case would indicate the precise link on a T-chain on which a person F may be checked, T for Nominative Case, lower v containing an abstract number F for Accusative, higher v which contains a person F and merges with Tense for Dative, and D for genitive.)

As Lecarme (2004) proposed for Somali, the tense F in D is linked to that in T via the T-chain proposed in Guéron & Hoekstra (1988; 1995). In (54) and (56), but not in (55), John checks a person F in D borne by the morpheme *s*. D being a part of the T-chain headed by T, the person F of *John* may take scope over the entire sentence and bind any uninterpretable person F within it, by (44a, b) above.

5.4.3   *Person-to-person transitivity in control structures*

5.4.3.1   I propose that a checked person F may check in turn that of a nominal situated in VP which does not itself raise to a position which checks a person F. Such person-checking under transitivity has a morphological reflex in some languages. In Spanish or Romanian, a [+hu] direct object is marked by the

morpheme *a* or *pe*, respectively, but only if the sentence contains a subject as well as an object.

Like a subject, a [+hu] direct object does not always check a person F. The person F cannot be checked in the absence of transitivity, as in (33a, b), or when an (often determinerless) direct object is incorporated in the verb, as in *Mario come manzanas* (Mario eats/is eating apples). On the contrary, the direct object must check its person F if the predicate requires it, as in *John convinced Mary he was right*. The person F of the subject checks that of the object via a member of the T chain, V, or possibly P, as in *John discussed Freud with Mary*. Other prepositions may block person-checking, even in subject position, like the *y* morpheme in Russian or its locative counterpart incorporated in English *there*.

We can now easily account for the two interpretations of a sentence like *The clown amused the children*. Under the first, psych interpretation, the verb *amuse* bears a person F which licenses a high v projection in which it is checked and to which the direct object raises to check its own person F. The direct object is then assigned the Experiencer event role. The subject in Spec TP does not check a person F, so that the Experiencer, as the highest +person argument, is construed as the T-controller of an event occurring in a psychological space. Under the second, dynamic interpretation, the verb bears no person F. The subject checks its person F in Spec TP and is construed as Trigger and T-controller of an event occurring in physical space. The subject then checks the person F of the direct object by person F transitivity, assigning it a biography coinciding with its own and the psychological property of consciousness.

I propose that the subject of certain verbs not only checks the person F of an object, assigning to it a biography included in the reference time, and the psychological property of consciousness, but may even transfer to the object the property of intentionality which it receives as a function of its syntactic position and which is otherwise not available to an object.

Such a transfer of intentionality characterizes what we may call 'rhetorical situations'. In such situations, the person F of a T-controller argument A targets the person F of an argument B in the absence of all physical contact between them, and tries to get B to undertake some action. The rhetorical situation underlies imperative sentences like (57a), sentences with deontic modals like (57b), French middle structures like (57c), and control structures like (57d). Here we will illustrate it in control structures.[5]

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[5] Our discussion of control is inspired by Landau (2000), Bianchi (2003), and Landau's references to Petter (1998).

(57)   a.   Speak to John!

       b.   Mary must leave.

       c.   Cette chemise se lave avec soin.

            (This shirt washes with care.)

       d.   Mary convinced/asked/forced/John to leave.

5.4.3.2   Verbs like *swim* or *arrive* imply a trajectory in physical space and time controlled by a human T-controller; psychological verbs like *annoy* imply a trajectory in psychological space and time controlled by a sentient Experiencer; and verbs like *ask* or *convince* imply an intentional trajectory which starts with the intention of a human T-controller located in the realis time/world and ends with an event inaugurating a new time/world.

5.4.3.2.1.   The T-chain in (58) links C1, whose indicative mood places the matrix event in the discourse world (W1); T1, which denotes the matrix event time; C2, whose irrealis mood morpheme introduces an unrealized new world (W2); and T2, which denotes an event located at a non-specified time in this new world.

(58)   Mary convinced John [PRO to leave]

Mary	past	convince	John		PRO	to	tj		leave
persi		+EXT	persj		nb.		persj		+EXT
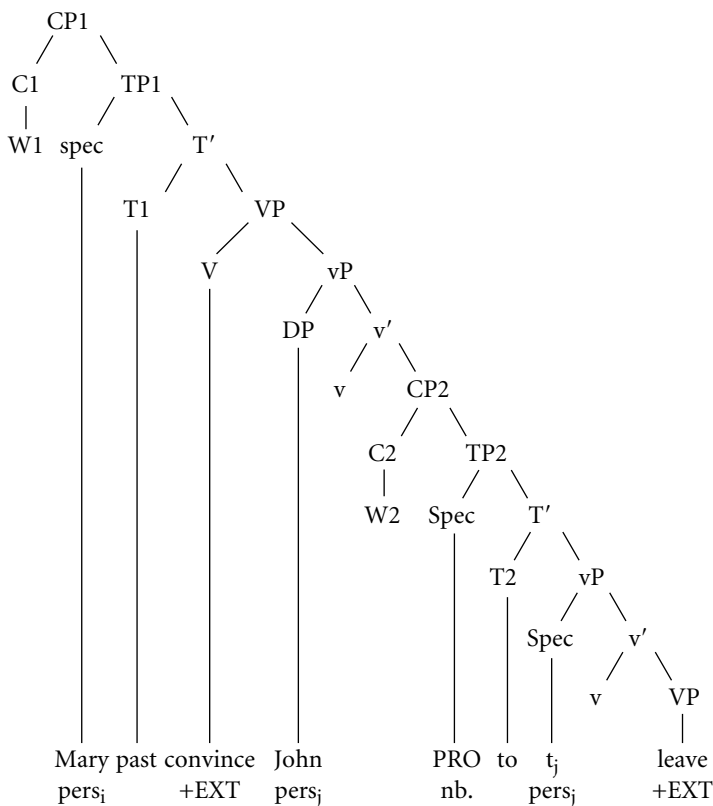
The lexical content and [+EXT] Akt F of the verb *convince* define an intentional interval, which Mary, Argument A checking a person F in Spec TP, controls. The person F of *Mary* targets and enters into a transitivity relation with that of *John*, Argument B. The biographies of the two +person arguments intersect. This allows Mary to transfer to John the psychological property of intensionality, which he could not otherwise obtain in his low syntactic position.[6]

The embedded sentence in (58) contains a PRO subject whose number/Akt F is checked in the embedded vP and which has an unidentified unchecked person F. Argument B of the matrix sentence, *John*, identifies the person F of PRO. The extension of the T-chain from V1 through C2 to T2 allows T2 to inherit a tense F which checks the person F of PRO. PRO now functions as T-controller as well as Manipulator of the embedded event.

The rhetorical control situation relies on several interacting construal mechanisms. Person-F transitivity allows the person F of the subject, argument A, to check that of the object, Argument B. The deontic verb licenses the transfer of an intentionality property to it. Binding of PRO by argument B of the matrix sentence identifies PRO in the embedded sentence. The extension of the T-chain from V1 to T2 provides T2 with a tense F which checks the newly identified person F of PRO. These mechanisms allow a T-controller trapped in the realis world with no spatial contact with any other argument to realize her/his intensions in time and space. S/he communicates her/his intensions to a spatial argument of a new irrealis world indirectly, via a relation of person F transitivity with an 'innocent bystander', who participates in the realis world as a psychological target and in the irrealis world as binder of the person F of an embedded PRO.

Subject control in (59) is nothing but a case of person F transitivity in which arguments A and B denote two instantiations in time of the person F of the same individual.

(59) Mary promised John [PRO to leave].

In (59), the person F of argument A, anchored in the realis world, targets her own person F in B at the end of the intentional path she controls. In (59) as in (58), the person F of B binds that of PRO which already has the Manipulator

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[6] The ceiling of the Sistine Chapel distinguishes a person-to-person relation from a physical relation and illustrates the transfer of intentionality from one participant to another. Although the medium of painting requires the relation between God and Adam to have a visible form, in the fresco the finger of God does not quite touch that of Adam, nor will it, for all eternity. God targets man, created in his image, by a person-to-person not a physical relation.

function in the embedded sentence, allowing PRO to function as T-controller of the embedded event.

5.4.3.3   As we have seen, a nominal with a lexical [+human] feature does not always function as a T-controller. It may be construed as a mere body, as in (33) above, or as a location, as in (35) and (36). Conversely, the trigger and T-controller of a temporally extended event need not be [+human], provided it has the lexical content and the syntactic position which allow it to be associated with a biography and with the properties needed to fulfil the event functions defined in TP. The T-controller is +human in (60a) but is a force of nature in (60b). In both cases, the subject has appropriate temporal properties, a biography which begins before the event time, and autonomy, if not will.

(60)   a. John destroyed the crops.

        b. The storm destroyed the crops.

The control sentences of (61) lack an intentional syntactic subject.

(61)   a. The rain washed down the stairs [after PRO entering the house].

        b. The bullet bounced off the wall [before PRO hitting the soldier].

        c. The road turns sharply [before PRO descending into the valley].

Such sentences are construed metonymically: the rain, the bullet, and the road function neither as triggers nor as T-controllers, but as Instruments which effect a series of gestures, like the key in (9b). They are the 'objective correlates' of the eyes of the speaker who functions as the effective Manipulator, and who controls the event by perceiving and describing it.

5.4.3.4   Consider, finally, the rationale clauses in (62).

(62)   a. Grass is green [PRO to promote photosynthesis].

        b. This store has decorated windows [PRO to attract customers].

        c. These pegs are round [PRO to fit into these holes].

        d. We have noses [PRO to keep our glasses on].

        e. Jesus died [PRO to save our lives].

        f. The boat was sunk [in order PRO to collect the insurance].

Williams (1985) proposed that the rationale clause in such sentences is controlled by the matrix event insofar as that event can be conceived as under the control of some purposeful agent. Let us integrate this intuition

into a morphosyntactic framework which includes the construal mechanism of person F transitivity.

Just as the subject transfers its intentional property metonymically, via person F transitivity, to the object in (59) or to a later temporal instantiation of itself in (60), in the sentences of (63) the speaker is the argument A which checks the person F of and transfers its own intentionality to an arbitrary argument B located in the discourse world. The +person F of argument B identifies the person F of the Manipulator PRO in the rationale clause, allowing it to function as T-controller of the embedded event.

And just as an overt T-controller attributes acts and intentions to another overt argument which shares its space and time (e.g. *John accused Bill of wanting to kill Max*), the covert speaker can target another covert argument in the discourse world whose biography intersects with her/his own, transferring to it her/his own property of intentionality. It is possible, after all, that grass is green because some intentional being, known to—or projected in time and space by—the narrator, caused it to be so for the purpose of promoting photosynthesis.

5.5 Conclusion

I have claimed that construal is purely spatial in VP/vP and purely temporal in TP/CP. I have replaced lexical theta-roles with fragmentary event functions determined by the lexical content of a predicate and the syntactic domain in which it selects its arguments. I propose that in addition to vP and CP, TP defines a phase as well; for each of these domains selects an external argument which organizes the lexical material it contains in terms of space or time. An argument is selected in VP for its spatial properties: the direct object measures the extension of the spatial configuration VP denotes, while the argument in Spec vP delimits it. If the configuration is complex, the vP subject functions as a Manipulator which realizes it with the help of an Instrument. The temporal event roles of Benefactive, Trigger, and T-controller are assigned in the TP domain. When the sentence implies a trajectory at the level of CP, above the scope of a syntactic subject, the speaker assumes the T-controller function by default.

Spatial transitivity—which links the Aktionsart number Fs of two arguments and, by metonymy, the arguments themselves, within a shared common space—characterizes the relation between the milk and the refrigerator in (2) or between the two hands of (37). Person F transitivity in the absence of physical contact links the subject and the benefactive arguments or the

dynamic and the receptive participants in a rhetorical relation in a control structure like (58).

At the interface of syntax and the conceptual-intentional component, construal mechanisms unify the fragmentary spatial and temporal interpretations derived in distinct syntactic phases. An argument which raises from the vP to the TP domain accumulates the event functions it receives in its distinct syntactic positions. The morphosyntactic mechanism of binding relates the spatial and temporal features of an argument in the absence of movement, deriving a single semantic argument with different event functions at different points of space or time. The conceptual mechanism of metonymy, which links a Manipulator to its instrument by substituting a part for a whole or vice versa, also creates relations between arguments on the basis of spatial and temporal/ personal feature transitivity. The fact that the all-pervasive mechanism of metonymy is not part of syntax or of LF, but only of the human mind, shows that a sentence can be coherently placed in time and space no sooner than at the interface of the syntax and the intentional conceptual components.

6

Complex Aspectual Structure in Hindi/Urdu

MIRIAM BUTT AND GILLIAN RAMCHAND

6.1 Introduction

South Asian languages are well known for possessing a large number of complex verbal constructions containing either a verb, a noun, or an adjective as main predicator and a 'light verb' as the part of the construction which carries the tense and agreement morphology. Light verbs in these languages have long intrigued grammar writers (e.g. Kellogg 1893; Chatterji 1926; McGregor 1968) and linguists (e.g. Vale 1948; Hook 1974), as their contribution to the complex construction does not appear to be a purely functional one. This is especially evident with V-V sequences (main verb followed by a light verb), where the contribution of the light verb has often been characterized via aspectual terms such as perfectivity (Hook 1991; Singh 1994) or inception/ completion (Butt 1995), but also via semantically less well-defined terms like forcefulness, suddenness, volitionality, or benefaction. The range of meanings is broad, and appears to be related to the basic lexical semantics of the base verb that is involved (i.e. 'take' vs. 'give' for benefaction, 'fall' for suddenness, 'hit' for forcefulness).[1]

[1] See Hook (1974) for a detailed description, Butt and Geuder (2001) for a detailed examination of the range of uses of the light verb 'give', and Bashir (1993) for a cross-linguistic perspective on the subtle ranges of meanings.

While the morphological and syntactic properties of these verbal complex constructions have been described in some detail for South Asian languages, the precise semantic characterization of the role of light verbs remains the subject of investigation and debate. This chapter proposes to take a fresh look from a perspective which presupposes a tight mapping between syntactic structure and semantic combinatorial possibilities. We aim to show that the morphosyntax of predicational structures is closely correlated with aspectual and event-structure notions in semantic representation. Our primary language of investigation is Hindi/Urdu,[2] for which we examine three distinct syntactic types of V-V collocations. We argue that these morphosyntactically distinct types correlate exactly with three distinct sub-evental architectures, thus lending support to our view of the syntax–semantics interface.

In what follows, we first lay out the data which furnish the basis of our discussion. After pointing out that light verbs and auxiliaries must be clearly distinguished from one another on phonological and syntactic grounds, we show that the three V-V constructions display differences in terms of whether they predicate jointly or separately. We then go on to explain the cluster of properties by proposing that verbs in general can be lexically attached/instantiated either as v, V or as part of a result phrase (R). A verb can be Merged in the (first phase) syntax as a v, but then must enter into a complex predicate construction with another verbal head or heads to complete the subevental structure. Each verb in the language carries syntactic category features which determine the possible positions of Merge. In the cases where the so-called main verb of the construction ends up giving rise to telic effects, this is because it has Merged to instantiate the R-head (result portion) of the predication. Conversely, when the light verb of the construction appears to contribute some variant on causative semantics, it is because this verb is Merging as v in the first phase syntax. Because of its explicit decompositional nature, the detailed consideration of the morphosyntax and semantics of the light verb construction ends up providing overt evidence for a three-way categorial decomposition of this type, and contributes invaluable data for investigating the constraints on their modes of combination. Moreover, the approach presented here allows a novel understanding of the internal mechanics of complex predication, i.e. of the precise manner in which light verb and main verb interact at the syntax–semantics interface.

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[2] The South Asian languages Urdu and Hindi are closely related. Both are among the 16 official languages of India and are spoken primarily in the north of India. Urdu is the national language of Pakistan. The data presented in this paper are drawn primarily from the dialect of Urdu spoken in Lahore, Pakistan, as well as from examples cited in the literature on both Urdu and Hindi.

6.2 The basic data

Before we turn to the central phenomena, we first outline the basic clause structural properties of Hindi/Urdu and its system of tense/aspect marking. Hindi/Urdu is an SOV (head-final) language with a mixed system of periphrastic constructions and tense/aspect inflections. The verb either inflects by itself or co-occurs with inflecting auxiliaries which carry tense and aspect. This is summarized in (1) for the verb *mar* 'hit'.

(1)

	Pres	Past	Fut	Impf Pres/Past	Perf Pres/Past	Prog Pres/Past
Urdu		*mara*	*marega*	*marta* + Aux (be)	*mara* + Aux (be)	*mar raha* + Aux (be)

mar-'hit'—3.Sg.M

Independent of this basic tense/aspect paradigm, there are several distinct classes of complex verbal constructions. Three of these concern us in this paper. The constructions all superficially consist of the structure V1 followed by V2, where only V2 inflects for tense/aspect.

6.2.1 *The 'tell' type: V1 Infinitive+Case V2*

In these constructions, the inflecting 'light' verb (here typically instantiated by the verb 'tell') combines with an infinitive or gerund which bears a case marker identical to those found on nominal arguments.[3]

A number of examples of the 'tell' type are given below. These constructions are similar to obligatory object-control structures in other languages (see examples (2) and (3)).[4]

(2) aɲʊm=ne   saddaf=ko   [xɑt   lɪk^h-ne]=ko   kɑh-a
     Anjum.F=Erg Saddaf.F=Dat letter.M.Nom write-Inf.Obl=Acc say-
     Perf.M.Sg

     'Anjum told Saddaf to write the letter.'

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[3] Case-markers in Urdu are clitics. The clitic *ko* fulfils both dative and accusative functions. The phonologically null case is consistently glossed as nominative. For a detailed discussion of the case system of Urdu see Butt and King (2004; 2005).

[4] Note that the 'force do' is a N-V complex predicate; but this fact does not make a difference for the purposes of this discussion (see Mohanan (1994) for an analysis of N-V complex predication in Hindi).

(3) a. radʰa=ne   mohɑn=ko   [kɪtab   parʰ-ne]=**ko**
         Radha.F=Erg Mohan.M=Dat book.FNom read-Inf.Obl=Acc
         mɑjbur ki-ya
         force do-Perf.M.Sg
         'Radha forced Mohan to read a book.'

     b. radʰa=ne   mohɑn=ko   [kɪtab   parʰ-ne]= **par**
         Radha.F=Erg Mohan.M=Dat book.F.Nom read-Inf.Obl=on(Loc)
         mɑjbur ki-ya
         force do-Perf.M.Sg
         'Radha forced Mohan to read a book.'

     c. radʰa=ne   mohɑn=ko   [kɪtab   parʰ-ne]=**ke liye**
         Radha.F=Erg Mohan.M=Dat book.F.Nom read-Inf.Obl=for
         mɑjbur ki-ya
         do-Perf.M.Sg
         'Radha forced Mohan to read a book.'

A number of different case markers are theoretically possible here, depending on the final predicate. While the case marker used on the V1 infinitive in the case of 'tell' is the accusative one, the case marker when the V2 consists of 'force do' seems to be subject to variation with little apparent difference in meaning. Crucially, when we come to describing the syntactic properties of this construction, the actual choice of case marker will not affect the behaviour we examine.

6.2.2 *The 'let' type: V1-Infinitive.Oblique V2*

In these constructions, the inflecting 'light' verb combines with a main verb in the oblique inflectional form of the infinitive, but with no case marker.[5] The range of meanings that arise include inceptive ((4a)), and permissive ((4b)) readings.

(4) a. vo   **ro-ne**   **lɑg-i**
         Pron.Nom cry-Inf.Obl be.attached-Perf.F.Sg
         'She began to cry.'

     b. kɪs=ne   kʊtte=ko   gʰɑr ke ɑndɑr   **a-ne**
         who.Obl=Erg dog.M.Obl=Dat house Gen.Obl inside come-Inf.Obl
         di-a?
         give-Perf.M.Sg
         'Who let the dog come into the house?'   (Glassman 1976: 235)

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5 The infinitive also functions as a verbal noun (Butt 1993; 1995).

6.2.3 *The 'result' type: V1 Stem V2*

These constructions are formed from what looks like the stem form of the main verb and an inflecting light verb, here illustrated by 'give' and 'take'. They are possibly the most difficult to characterize semantically. Traditionally, the addition of the light verb has been said to contribute a range of meanings such as completion, inception, benefaction, force, or suddenness (see Hook 1974 for a detailed study).

(5)   a. nadya=ne   xat   **lɪkʰ li-ya**
          Nadya.F=Erg letter.M.Nom write take-Perf.M.Sg
          'Nadya wrote a letter (completely).'

      b. nadya=ne   makan   **bana di-ya**
          Nadya.F=Erg house.M.Nom make give-Perf.M.Sg
          'Nadya built a house (completely, for somebody else).'

  The common denominator of all these different types of meaning is the bounded or telic event described by the construction. Indeed, it has been claimed that this class of light verbs is really a class of aspectual auxiliaries giving rise to perfectives in the language (e.g. Hook 1991; 1993). However, as we show in the next section, the light verbs in question do not pattern with auxiliaries either syntactically or morphologically. While it is true that the light verb seems to create accomplishment or achievement predicates, this is crucially different from the role of an actual perfective tense form or auxiliary (see Butt and Geuder 2001 for detailed argumentation, also Bashir 1993 for similar conclusions). In particular, the resulting accomplishments/achievements are not necessarily perfective in broader (outer) aspectual terms, but occur in all the tense/aspect forms of the language; see (6b) for an example of the accomplishment predicate derived via this kind of construction occuring in the past continuous tense.

(6)   a. mariam   imel   lɪkʰ rah-i   tʰ-i
          Miriam.F.Nom e-mail.F.Nom write Prog-F.Sg   be.Past-F.Sg
          jab vili   kamre=mẽ   a-ya
          when Willi.M.Nom room.M.Obl=in come-Perf.M.Sg
          'Miriam was writing an e-mail when Willi came into the room.'

      b. mariam   imel   lɪkʰ mar rah-i tʰ-i
          Miriam.F.Nom e-mail.F.Nom write hit Prog-F.Sg be.Past-F.Sg
          jab vili   kamre=mẽ   a-ya
          when Willi.M.Nom room.M.Obl=in come-Perf.M.Sg
          'Miriam was dashing off an e-mail when Willi came into the room.'

Significantly, the effect of this construction is to create a different kind of Aktionsart, a distinction traditionally taken to be encoded within lexical items. This is a first indication that the 'result'-type construction is more tightly bound as a unit than the other two types (see section 6.6.3).

In each of these cases, two separate lexical items combine compositionally to produce a more complex type of predication. This is not unusual in itself—there are many cases in natural language where a clausal or infinitival projection forms the complement to a higher matrix verb. The fact that this language exhibits a word-order pattern which can be described as 'head-final' means that a subordinating construction will result in a sentence where the matrix verb and the subordinated non-finite verb are linearly adjacent. In such a case we would be dealing with a simple biclausal construction with a non-finite subordinate clause. At the other end of the spectrum, it is possible—and commonplace—for a main verb to occur with one or more 'auxiliaries' which simply modify the eventuality description in particular ways and which carry the tense and agreement inflection of the clause. Here the construction would be monoclausal, but once again, the 'head-final' language would express this with a word order in which the main verb and auxiliary are linearly adjacent. Our three types of construction delineated above could in principle belong to either of these two combinatorial possibilities, neither of which would be particularly interesting from a cross-linguistic perspective. In the first section of this chapter we labour to convince the reader that the complex predicates of the 'let' and 'result' types do not fall neatly into either the monoclausal or the biclausal characterization given above, but represent a decomposition of verbal meaning that is traditionally carried by single lexical items in languages of the more familiar European variety.

In section 6.3 we compare complex predicates to auxiliary constructions, and argue that the light verb is not an auxiliary, and carries more information than the kind of functional and grammatical information traditionally associated with auxiliaries. In section 6.4 we demonstrate that the 'tell' type contrasts with the 'let' type and the 'result' type in that only the former can be shown to be a biclausal construction from the point of view of all the diagnostics available to us in the language. The section ends with a summary of the paradoxical properties of the 'let' and 'result' complex predicates which will be the focus of the analysis in subsequent sections.

6.3 Light verbs are not auxiliaries

Light verbs in Hindi/Urdu appear to make a functional contribution to the sentence, as they signal the inception or completion of an event (among other things). For these reasons, light verbs have often been classed as a type of auxiliary. However, there is good evidence that Hindi/Urdu does possess auxiliaries, and that light verbs are syntactically and distributionally distinct from them in a number of ways.[6]

First it should be noted that the ordering within the Hindi/Urdu verbal complex is strict, and requires a distinction to be made between main verbs, light verbs, the passive (formed with 'go'), the progressive auxiliary, and the 'be' auxiliary.

(7)   Main verb (light verb) (passive) (progressive) (be auxiliary)

There are three uncontroversial auxiliaries in Hindi/Urdu, as shown in (8).[7]

(8)

Urdu Auxiliaries			
Form	**Meaning**	**Inflection**	**Defective cells**
ho	to be	Pres/Fut/Impf/Perf	Past
th-a/i/e/ĩ	be (Orig. 'stand')	Past	All others
rah	Progressive	Perf.	Pres./Past/Prog.
	(Orig. 'stay')	(Fut. Impf. only special morphology)	

If one considers (8), it can be seen that the auxiliaries have defective paradigms and do not inflect according to all possible tenses and aspects in the verbal system; in fact, they function to create a number of the tense/aspect meanings in the language. On the other hand, true 'light' verbs are not a subclass of the tense/aspect system in this way—they inflect according to *all* tenses and aspects possible in the language.

From a syntactic point of view, it can be shown that auxiliaries and light verbs have distinct syntactic properties with respect to (at least) case marking, reduplication, and topicalization. In the following subsections, we demonstrate each of these diagnostics in turn.

6.3.1 *Case*

Urdu/Hindi is a split-ergative language: ergative subjects only appear in the perfect tenses (see Davison 1999 for a very detailed discussion). However, even

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[6] Much of the material in this section duplicates argumentation in Butt and Geuder (2001).
[7] Modals are ignored for the purposes of this discussion, as they function more like main verbs.

in the presence of perfect morphology, the verb's lexical specification is important because only (di)transitive verbs allow ergative case on the subject in the first place. In the case of complex predicates, it is possible for there to be a mismatch between the transitivity of the main verb and the light verb. Interestingly, it is the transitivity properties of the *light* verb that determine the possibility of ergative case marking in this case (see Butt 1995).[8]

In example (9), the transitive main verb 'write' carries perfect morphology, and therefore structurally requires ergative case on the subject. However, in a complex predicate construction, 'write' can be paired up with one of at least two types of V2: the unaccusative light verb 'fall' disallows ergative case in general, while the light verb 'take' requires it. The examples in (10) show that the case marking of the subject is dependent on the requirements of the light verb, rather than those of the main verb on its own.

(9)   ʊs=ne/*vo   xɑt   lɪkʰ-a
         Pron.Obl=Erg/Pron.Nom letter.M.Nom write-Perf.M.Sg
         'He wrote a letter.'

(10)   a. *ʊs=ne/vo   xɑt   lɪkʰ paṛ-a
            Pron.Obl=Erg/Pron.Nom letter.M.Nom write fall-Perf.M.Sg
            'He fell to writing a letter.'

        b. ʊs=ne/*vo   xɑt   lɪkʰ li-ya
            Pron.Obl=Erg/Pron.Nom letter.M.Nom write take-Perf.M.Sg
            'He wrote a letter (completely).'

If we think of case marking as being dependent on the lexical/argument structural properties of individual verbs, as is usual, then the relevance of the light verb here is somewhat surprising. At the very least, it shows that the light verb does not have the status of an auxiliary, whose contribution to the possibility of ergative case marking is entirely restricted to the perfect vs. non-perfect distinction.

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[8] Mahajan (2001) points out some exceptional cases where the light verb alone does not determine the possibility of ergative case-marking, but instead the transitivity of the resulting form. (In the general case, the transitivity of the resulting V-V structure is determined by the light verb so that the two proposals are indistinguishable.) Mahajan's data do not cast doubt on our claim that the light verb is crucially implicated in argument structure and case-licensing, but they do highlight the fact that it is the *combination* of the two verbal pieces that is important, and that the combinations are not trivially calculable on the basis of lexical notations. This idea is very much in the spirit of the proposals to be made in this chapter—we are attempting to give a precise account of the way in which verbal heads combine and the syntax that underlies the argument structure properties that we find.

6.3.2 *Reduplication*

Differences between verbal complexes can also be found with respect to reduplication. In complex predicates the light verb, the main verb, or both may be reduplicated (see Fitzpatrick-Cole (1994; 1996) for a detailed study on Bengali; see Abbi (1992) for a general discussion of reduplication in South Asian languages). Example (11) below shows the reduplication of the light verb 'go' to give an 'over and over again' interpretation.

(11) a. vo   so   **ja-ti**   t^h-i

      Pron.Nom sleep go-Impf.F.Sg be.Past-Sg.F

      'She to used to go to sleep.'

    b. vo   so   **ja-ti**   **va-ti**   t^h-i

      Pron.Nom sleep go-Impf.F.Sg go.Redup-Impf.F.Sg be.Past-Sg.F

      'She used to keep going to sleep (at inopportune moments).'

In contrast, it is not possible to reduplicate an auxiliary in this way. Example (12) shows the ungrammaticality that results from trying to reduplicate the progressive auxiliary, while (13) is an example of an unsuccessful 'be' auxiliary reduplication.

(12) a. vo   so   **rɑh-i**   t^h-i

      Pron.Nom sleep Prog-F.Sg be.Past-Sg.F

      'She was sleeping.'

    b. *vo   so   **rɑh-i**   **vah-i**   t^h-i

      Pron.Nom sleep Prog-F.Sg Prog-Redup be.Past-Sg.F

      'She was sleeping.'

(13) a. vo   so-ti   t^h-**i**

      Pron.Nom sleep-Impf.F.Sg be.Past-Sg.F

      'She used to sleep.'

    b. *vo   so-ti   t^h-**i**   š-i

      Pron.Nom sleep-Impf.F.Sg be.Past-Sg.F be.Redup

      'She used to sleep.'

Once again, this diagnostic shows that the light verb patterns more like an ordinary main verb than the grammaticalized auxiliary does: both light verbs and main verbs have the level of prosodic and semantic autonomy required for reduplication.

6.3.3 *Topicalization*

With regard to topicalization, a main verb can always be topicalized away from a light verb, as shown in example (14a), where 'sleep' has been fronted, stranding the light verb 'go'. In contrast, the very same main verb 'sleep' cannot be fronted/topicalized away from a cluster of auxiliaries, as the ungrammaticality of (14b) shows (cf. Mohanan 1994).

(14)   a. **so**   to   bɑcca   **ga-ya**
              sleep Top child.M.Sg.Nom go-Perf.M.Sg
              'The child has gone to sleep.'

        b. ****so**   to   bɑcca   **rɑh-a**   **hɛ**
              sleep Top child.M.Sg.Nom Prog-M.Sg be.Pres.3.Sg
              'The child is sleeping.'

Once again, the inability of auxiliaries to strand under topicalization seems to correlate with their highly dependent and functional nature. This defectiveness is, however, strikingly absent with the 'light' verb.

To summarize: there is good evidence that light verbs form a distinct subclass, both inflectionally and syntactically, as opposed to pure auxiliaries in this language. Any analysis which conflates the two types of construction is missing a substantial set of syntactic, semantic, and morphological generalizations.

6.4 Distinguishing joint predication from separate predication

Light verb constructions are thus clearly differentiable from simple auxiliary cases, and so a standard monoclausal analysis with the light verb in the role of tense/aspect modifier is not immediately tenable. As mentioned before, the other obvious relationship possible between two verbal elements is that of simple complementation to create a biclausal structure. With regard to this second possibility, we will find that light verb constructions themselves do not form a unified class. As has already been seen, even a superficial inspection of the morphology revealed that the types of V-V construction are distinct. In this section, we describe the main syntactic and morphological properties of the three construction types introduced at the beginning of the chapter, and argue that a simple biclausal analysis is possible for only one of them.

Specifically, we must investigate next whether the different complex verbal constructions project independent clauses with distinct complete functional complexes (CFCs), or whether the verbal heads in question in some way *jointly* determine a simplex CFC for the sentence. In investigating the monoclausal or

biclausal status of these constructions in this sense, certain diagnostics from the literature can be applied, particularly for Hindi/Urdu (Butt 1995; Mohanan 1994).

To anticipate the results of the following subsections, the tests with respect to anaphora, control, and verb agreement show that the 'result' type and the 'let' type behave like a single predicational unit, while the 'tell' type contains two distinct argument domains and is thus biclausal in this sense.

6.4.1 *Agreement*

Generally in Hindi/Urdu, the descriptive generalization is that the verb agrees with the hierarchically highest nominative argument (Mohanan 1994).[9] If there is no nominative argument, masculine singular marking appears on the verb as the default. An inspection of the data below shows that the 'result' type construction and the 'let' type construction, but not the 'tell' type, follow the pattern of agreement found in simple clauses. In particular, the internal argument of V1 can trigger agreement on V2 if it is the highest nominative argument in a sentence of the 'result' type (15), and also of the 'let' type (16).

SIMPLE CLAUSE: OBJECT AGREEMENT

(15) a. **adnan**   gari   **cala-ta**   hε
         Adnan.M.Nom car.F.Nom drive-Impf.M.Sg be.Pres.3.Sg
         'Adnan drives a car.'

   b. adnan=ne   **gari**   **cala-yi**   hε
         Adnan.M=Erg car.F.Nom drive-Perf.F.Sg be.Pres.3.Sg
         'Adnan has driven a car.'

   c. nadya=ne   gari=ko   **cala-ya**   hε
         Nadya.F=Erg car.F=Acc drive-Perf.M.Sg be.Pres.3.Sg
         'Nadya has driven the car.'

RESULT TYPE: OBJECT AGREEMENT

(16) a. nadya=ne   **makan**   **bana li-ya**
         Nadya.F=Erg house.M.Nom make take-Perf.M.Sg
         'Nadya built a house (completely).'

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[9] Mohanan (1994) works in a framework which shares features with LFG (Lexical-Functional Grammar). Within LFG, this constraint is stated in terms of the SUBJ > OBJ grammatical function hierarchy, but the same generalization would be expressed in a Principles and Parameters framework in terms of the c-command relations in the base-generation of arguments. Also recall that nominative in this context refers to the phonologically null case used for subject and object arguments in the language.

   b. nadya=ne   **kʊrsi**   bɑna **l-i**
      Nadya.F=Erg chair.F.Sg.Nom make take-Perf.F.Sg
      'Nadya built a chair (completely).'

<small>LET TYPE: OBJECT AGREEMENT</small>

(17) a. ɑnjʊm=ne   saddaf=ko   **xɑt**   likʰ-ne   **di-ya**
         Anjum.F=Erg Saddaf.F=Dat letter.M.Nom write-Inf.Obl give-
         Perf.M.Sg
         'Anjum let Saddaf write a letter.'

   b. ɑnjʊm=ne   saddaf=ko   **cɪṭṭʰi**   lɪkʰ-ne   **d-i**
      Anjum.F=Erg Saddaf.F=Dat note.F.Nom write-Inf.Obl give-
      Perf.F.Sg
      'Anjum let Saddaf write a note.'

However, as shown in (18), it is not possible for an internal argument of V1 to trigger agreement on V2 in a sentence of the 'tell' type, even if it could conceivably count as the 'highest nominative argument'. The masculine singular marking on the verb in (18a) must thus be analysed as a form of default agreement.[10]

<small>TELL TYPE: NO OBJECT AGREEMENT</small>

(18) a. ɑnjʊm=ne   saddɑf=ko   [**xɑt**   lɪkʰ-ne]=ko   **kɑh-a**
         Anjum.F=Erg Saddaf.F=Dat letter.M.Nom write-Inf.Obl=Acc say-
         Perf.M.Sg
         'Anjum told Saddaf to write the letter.'

   b. ɑnjʊm=ne   saddɑf=ko   [**cɪṭṭʰi**   likʰ-ne]=ko   **kɑh-a**
      Anjum.F=Erg Saddaf.F=Dat note.F.Nom write-Inf.Obl=Acc say-
      Perf.M.Sg
      'Anjum told Saddaf to write the note.'

6.4.2 *Control*

With respect to control phenomena, both the 'result'-type and the 'let'-type constructions behave as if they have a single subject. The adverbial 'having'

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[10] So-called Long Distance Agreement is possible in Urdu/Hindi; however, this phenomenon is not relevant here (see Butt (1993; 1995) and Bhatt (forthcoming) for some discussion and further references).

clause in these constructions can only be controlled by a matrix subject (Mohanan 1994), and since the control is unambiguous in (19) and in (20), one is forced to the conclusion that only a single subject controller is available despite the presence of two verbs (a more detailed discussion can be found in Butt 1995).

RESULT TYPE: ONLY ONE POSSIBLE SUBJECT CONTROLLER

(19) **anjʊm=ne**$_i$ saddaf= ko$_j$ [——$_{i,*j}$ darvaza   kʰol kar]
Anjum.F=Erg   Saddaf.F=Acc   door.M.Sg.Nom open having
andar bula di-ya
inside call give-perf.M.Sg
'Anjum, having opened the door, called to Saddaf to come in.'

LET TYPE: ONLY ONE POSSIBLE SUBJECT CONTROLLER

(20) **anjʊm= ne**$_i$ saddaf= ko$_j$ [——$_{i,*j}$ darvaza   kʰol kar]
Anjum.F=Erg Saddaf.F=Dat   door.M.Sg.Nom open having
saman=ko   andar rakʰ-ne   di-ya
luggage.M=Acc inside put-Inf.Obl give-Perf.M.Sg
'Anjum, having opened the door, let Saddaf put the luggage inside.'

In the final type of construction, on the other hand, the sentence is ambiguous. Both the 'teller' and the 'putter' in (21) below are possible controllers for the adverbial modifying clause.

TELL TYPE: TWO POSSIBLE SUBJECT CONTROLLERS

(21) **anjʊm= ne**$_i$ saddaf= ko$_j$ [——$_{i,*j}$ darvaza   kʰol kar]
Anjum.F=Erg Saddaf.F=Dat   door.M.Nom open having
Saman=ko   andar rakʰ-ne=ko   kah-a
luggage.M=Acc inside put-Inf.Obl=Acc say-Perf.M.Sg
'Anjum told Saddaf to put the luggage inside, after having opened the door.'

6.4.3 *Anaphora*

It can be shown in Hindi/Urdu that the reflexive **apn-**'self' is subject-oriented (Gurtu 1985; Mohanan 1994; Mahajan 1990). Once again, only two of the constructions (the 'result' and 'let' types) behave as if they have a single subject: in (22) and (23) respectively, there is only one possible antecedent for the reflexive.

RESULT TYPE: SUBJECT IS ANTECEDENT FOR THE REFLEXIVE

(22) **anjʊm= ne**$_i$ saddaf= ko$_j$ **apn-e**$_{i, *j}$ gʰar   ke andar
      Anjum.F=Erg Saddaf.F=Acc self-Obl   house.M Gen.Obl inside
      bula di-ya
      call give-Perf.M.Sg
      'Anjum asked Saddaf into self's (Anjum's) house.'

LET TYPE: SUBJECT IS ANTECEDENT FOR THE REFLEXIVE

(23) **anjʊm= ne**$_i$ adnan= ko$_j$ **apn-i**$_{i,*j}$ gaṛi   cala-ne
      Anjum.F=Erg Adnan.M=Dat self-F.Sg car.F.Sg.Nom drive-Inf.Obl
      d-i
      give-Perf.F.Sg
      'Anjum let Adnan drive self's (Anjum's) car.'

In the 'tell' type, on the other hand, the 'driver' in (24) is a possible antecedent for the reflexive, indicating that it is also functioning as the PRO subject of an embedded clause.

TELL TYPE: OBJECT (EMBEDDED SUBJECT) IS ANTECEDENT FOR
THE REFLEXIVE

(24) anjʊm= ne$_i$ **adnan= ko**$_j$ [**apn-i**$_{?*i,j}$ gaṛi   cala-ne]=ko
      Anjum.F=Erg Adnan.M=Dat self-F.Sg   car.F.Sg.Nom drive-Inf.Obl=Acc
      Kah-a
      say-Perf.M.Sg
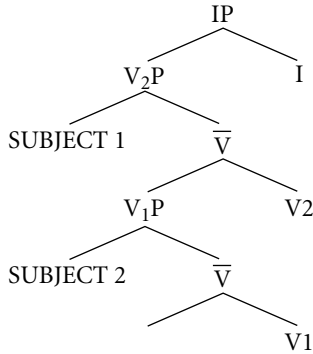   'Anjum told Adnan to drive self's (Adnan's) car.'

The three distinct diagnostics we have examined here provide clear and unambiguous evidence for the difference between our first two types (the 'result' and 'let' types) and the 'tell' type. Light verb constructions of the former type are monoclausal from the point of view of agreement, control and anaphora; constructions of the latter type are biclausal according to all those diagnostics.

Thus, it seems clear that the 'tell' type must be treated as an instance of true subordination in which the V1 projects its own functionally complete (but non-finite) phrase. This projection in turn then functions as the theta-marked argument of the higher verb V2. We remain agnostic here about the precise categorial nature of the V1 projection. As the projection of V1 is overtly case-marked, there is some reason to represent the projection as a DP. However, as

the subordinate projection also determines its own complete functional complex and has the internal constitution of a verbal projection, a *v*P analysis would also be reasonable.

BICLAUSAL ANALYSIS: THE TELL TYPE

(25)

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                        IP
                      /    \
                   V₂P      I
                  /    \
          SUBJECT 1     V̄
                       /  \
                    V₁P    V2
                   /    \
           SUBJECT 2     V̄
                        /  \
                            V1
```

We do not propose to resolve the naming problem with respect to this well-known issue in the treatment of gerunds/infinitives, but assume the latter analysis for concreteness. A tree diagram for the biclausal construction is shown in (25) (abstracting away from the decomposition of a verb into *v* and V for the purposes of clarity).

We will take it that the analysis of this biclausal complementation structure is relatively uncontroversial, and we will concentrate on the more problematic 'result' and 'let' constructions, which do not fall neatly into either of our obvious preestablished categories. It is these constructions that challenge the neat division between biclausality and monoclausality.

6.4.4 *The paradox of complex predicates*

The central problem that this chapter seeks to address, then, is the representation of complex predicates of the 'result' type and the 'let' type above. These two constructions can be shown to be neither simple auxiliary constructions nor biclausal complementation structures. Rather, both parts of the verbal complex are implicated in the argument structure and case-marking possibilities of the construction, and both contribute to the overall Aktionsart of the event. Given these facts, and given the close integrity of the two parts of the complex verb, it is tempting to classify them as purely 'lexical' constructions with no syntactic autonomy for the individual pieces. However, this view is clearly not correct. For both types of construction, the light verb may move away from the main verb under certain discourse conditions, in particular

under topicalization, as shown in examples (26) and (27) (see Butt 1995 for more details).

(26) lɪkʰ   to   nadya   xɑt=ko   l-e-g-i
      write Top Nadya.F.Nom letter.M=Acc take-3.Sg-Fut-F.Sg

      'As for writing, Nadya will be able to write a letter.'

(27) lɪkʰ-ne   to   ɑnjʊm=ne   saddaf=ko   cɪṭṭʰi   d-i
      write-Inf.Obl Top Anjum.F=Erg Saddaf.F=Dat note.F.Sg.Nom give-Perf.F.Sg

      'As for writing, Anjum let Saddaf write a note.'

Moreover, while there are certain selectional restrictions at work between the main and the light verb, the constructions are also productive, and have an underlying semantics that is regular and compositional: in the case of the 'let' type we consistently get the addition of a causer; in the case of the 'result' type, the addition of a telos. In our opinion, to ignore these regularities is to ignore an important generalization about the ways in which so-called 'lexical' meanings are built up. In what follows, we will argue that the different pieces of the complex predicates here are the instantiations of different heads within any kind of l-syntax (See Hale and Keyser 1993), or 'first phase syntax' (See Ramchand 2003) which is a syntax representing the finely articulated decomposition of the event structure and argument taking properties of predicational items. The paradox of complex predications of this type can be solved if we acknowledge that single lexical items in one language can be lexicalized as separate 'pieces' in another language; and that what we think of as a lexical item with its argument structure is part of a combinatoric system of syntactic structure corresponding to an event structure decomposition.

We turn now to a description of the system and the set of assumptions we will be working with in our analysis of these constructions.

6.5 The syntax and semantics of events

6.5.1 *Background assumptions*

Under a neo-Davidsonian semantic representation (Davidson 1967; Higginbotham 1985; Parsons 1990), every verb contains an event position in its theta-grid, available for modification and theta-binding. Further, thematic roles are represented as separate relations connecting the event to an individual. See the representation of the simple sentence in (28).

(28) Miriam drank five whiskies in the pub last night.

      $\exists e$[drinking(e; 'Miriam','5whiskies') & last-night(e) & in-the-pub(e) & Cul(e)]

Our approach will share the intuition of the neo-Davidsonian position that event variables are a crucial element in the logical representation of sentences. We will take this a little further, and assume that the event position classically taken to be associated with a single lexical item may actually be internally complex. In other words, we believe that certain complex events can be decomposed into sub-events which are potentially events in their own right, but which can combine in a number of systematic ways to produce the more complex forms. The possibilities for event combination at this level are not simply mereological, as in the lattice-theoretic approach of Link (1983) but correspond to two distinct types of event–event relation which we take to be part of the semantic ontology.

The first relation between events that we think is important is the relation of 'causation'. This relation has already found favour in a number of recent approaches to event and argument decomposition in the syntax (Hale and Keyser 1993; Ritter and Rosen 1998) and semantics (Dowty 1979; Jackendoff 1990; Levin and Rappaport Hovav 1995). The idea is that the event position corresponding to a transitive verb such as 'build' can be decomposed into two subevents related by causation where e_1 is the causing or instigating force and $e_{\pm2}$ is the event of house-building (we follow Hale and Keyser's notation in using $\rightarrow$ to represent the relationship between the subevents in (29)).

(29)   build (e) *where* $e = e_1 \rightarrow e_2$: [cause-build(e_1) & process-build(e_2)]

Moreover, we follow Marantz (1984), Kratzer (1996), and others in assuming that the external argument is separable from the verbal root and its internal argument. In particular, we assume that it is introduced by the head that contributes the outer causational or initiational eventuality (see also Doron, this volume and Travis, this volume, for particular versions of this view).

The reasons for this kind of decomposition in both the syntax and the semantics rest on linguistic generalizations concerning morphological relations and argument structure alternations, and this is not the place to rehearse them. However, to the extent that the data from Hindi/Urdu fits neatly into this schema, it will provide additional empirical justification for the general approach.

The second important relation between events is that of telic augmentation. Once again, following much recent work (see Parsons (1990), Higginbotham (1999), and Rappaport Hovav and Levin (1998) for an analysis in terms of a

differing kind of lexical decomposition), we assume that accomplishment predicates (in the Vendler (1967) sense) consist of two sub-events of process and telos respectively in their representation. In (30) we show a representation of the sub-events process (e1) and result state (e2) as based on proposals by Higginbotham (1999).[11]

(30)   'cross the street'(e) *where e* $=<$ e1, e2 $>$: [process-cross(e1) & result-of-crossing(e2)]

The event pair in angled brackets shown above can be called an 'accomplishment event structure', or a 'telic pair'. We will follow the convention of using angled brackets when we mean that the event positions in question are related in this very specific aspectual way.

A number of further comments are in order. The two relations of causation and telic augmentation are the only primitives of the event combinatorial system which can be used to create complex events of the same logical type. Sub-events themselves are not of a different ontological type from macro events—out of combination they are of the same order as simple processes or states. Consider something like an individual 'apple' which can have systematic and relevant subparts (skin, core seeds, etc.) which could be labelled as individuals in their own right; this does not mean that 'apple' is anything other than an ordinary individual within the semantics. Similarly, the macro-event corresponding to a predication is just an event which happens to have sub-parts. For some linguistic purposes (anchoring to tense, adverbs, and intersentential effects) this event is the only event variable manipulated or 'seen' by the logical relations. However, the evidence from aspectual semantics and internal morphology of verbs indicates that eventive substructure is linguistically real and follows certain strict syntactic and semantic generalizations.

It is also important to appreciate that unlike previous work in the literature, we are decomposing an event into a maximum of three potential sub-events: causing event (e1), caused process (e2), and caused result state (e3). The full potential decomposition of a lexical accomplishment is in (31). (We assume in addition that a macro-event position e exists which interacts with external processes of modification and tense interpretation and certain higher-level adverbials.)
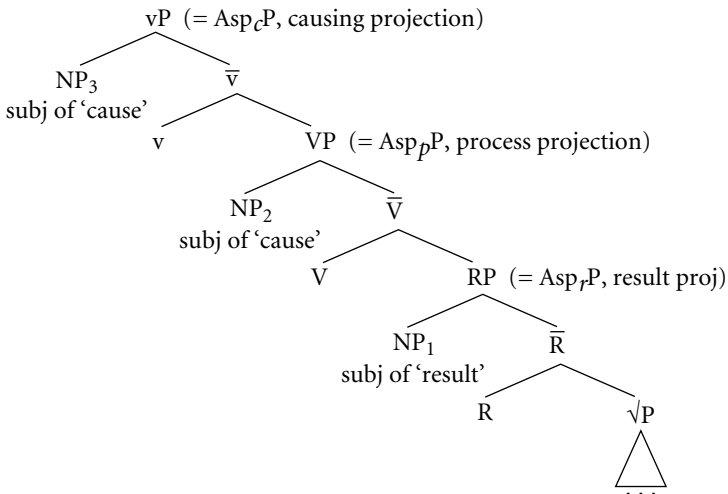
(31)   e: e $=$ e1 $\rightarrow<$ e2, e3 $>$

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[11] Note that we follow Bach (1986) in considering states a sub-type of eventualities.

6.5.2 *A first-phase syntax*

Many related proposals exist which seek to correlate the morphosyntax and the semantics of event structure in an intimate way (see Borer 1998; Diesing 1998; Ritter and Rosen 1998; Travis 1994; this volume; Doron, this volume; Erteschik-Shir and Rapoport, this volume). The common idea behind these proposals is that the syntactic projection of arguments is based on event structure. We make a specific proposal here in proposing the event structure in (32), where three event projections are necessary to represent all the possible components of the event structure building processes of natural languages.

(32)

vP $(= Asp_cP,$ causing projection)

NP_3
subj of 'cause'

$\overline{v}$

v

VP $(= Asp_pP,$ process projection)

NP_2
subj of 'cause'

$\overline{V}$

V

RP $(= Asp_rP,$ result proj)

NP_1
subj of 'result'

$\overline{R}$

R

$\sqrt{P}$

. . .

As we see in (32), the verb phrase contains three different projections and each projection is an instantiation of a (possible) sub-part of the whole event, corresponding to the semantic decomposition described above.

- vP introduces the causation event and licenses different types of external argument ('subject' of cause).
- VP specifies the nature of the change or process and licenses the entity undergoing change or process ('subject' of process).
- RP gives the 'telos' or 'result state' of the event and licenses the entity that comes to hold the result state ('subject' of result).

For concreteness, we show here how we envisage the semantic interpretation of this structure being built up. We take particular nodes in the first phase syntax tree to denote relations between properties of events and properties of events, constructing more and more complex event descriptions.

Under this more 'constructionist' view, neither events nor individual entities are arguments of the lexical item itself, but of the predicates introduced by the semantic interpretation of particular categorial nodes; however, like the neo-Davidsonian position, events and individuals are never all co-arguments of the same predicate, and they are discharged in different ways.

In what follows we lay out a kind of post-Davidsonian semantics which interprets the verbal heads of the l-syntax in a regular and systematic way. As discussed above, there are two primitive modes of sub-event composition to create complex events.[12]

(33) Event Composition Rule I

$e = e_1 \rightarrow e_2$: e consists of two sub-events, e_1, e_2 such that e_1 leads to or causes e_2 (see Hale and Keyser 1993)

(34) Event Composition Rule II

$e =< e_1, e_2 >$: e consists of two sub-events, e_1, e_2, such that e_1 and e_2 form an accomplishment event structure where e_1 is the process portion and e_2 is a state interpreted as the result state of the process. (see Parsons 1990; Higginbotham 1999)

There are a number of general primitive predicates over events corresponding to the basic sub-event types:

(35) a. Result(e) : e is a state that a process leads to.

b. Process(e): e is a process or transition.

c. Initiation(e): e is an initiational state which causes a process or transition.

Further, the objects of particular event types are interpreted according to the primitive role types defined as the relations between objects and events below:

(36) a. Subject (x, e) and Initiation(e) entails that x is the Initiator of e.

b. Subject (x, e) and Process(e) entails that x is the Undergoer of the process.

c. Subject (x, e) and Result(e) entails that x is the Holder of the state (Resultee).

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[12] In Ramchand (2003), these two modes are reduced to one, more abstract causational relation. However, since nothing in our current argument hinges on this, we will stick to the more traditional conception here.

The R head in the first phase syntax is interpreted as building a state description that has a particular 'holder' in its specifier position. Its semantic interpretation is given in (37).

(37) $[[R]] = \lambda P \lambda x \lambda e[P(e) \,\&\, \text{Result}(e) \,\&\, \text{Subject}(x,e)]$

When the RP is selected by a process-introducing head, V, the holder of the state is then the holder of a 'result'. We will label these special types of holders Resultees. The interpretation of the process-introducing head V, is given below. It takes an argument in its specifier position that is interpreted as the undergoer of the process, and a state description in its complement position that is interpreted as the result state:

(38) $[[V]] = \lambda P \lambda x \lambda e \exists e_1, e_2[P(e_2) \,\&\, V'(e_1) \,\&\, \text{Process}(e_1) \,\&\, e =< e_1, e_2 > \,\&\,$ Subject $(x, e_1)]$

Finally, the highest verbal head, *v*, is interpreted as an initiating event which leads to the (possibly complex) event constructed by the lower structure that it combines with. The specifier position of this projection is interpreted as the 'causer' or Initiator of the sub-event.[13]

(39) $[[v]] = \lambda P \lambda x \lambda e \exists e_1, e_2[P(e_2) \,\&\, v'(e_1) \,\&\, \text{Initiation}(e_1) \,\&\, e = e_1 \to e_2$ & Subject $(x, e_1)]$

Given the semantics of these various heads, if the heads are not built up in the correct order, the derivation will at best converge as gibberish. Given the existence of this functional sequence, we will assume that the syntactic structures are freely built up by Merge, but that they have to be licensed by the presence of specific lexical items. One of the important features of this system is the way in which lexical items attach to this first phase syntax. Crucially, they are not inserted at a single terminal node in the first phase syntax, but simply Merge and project according to their category features. If Merge does not occur to build a functional sequence that is correctly ordered and interpretable, then the derivation will crash. At the interface, the encyclopedic content of the lexical items is unified with the semantic skeleton provided by the combinatoric system. There are dependencies in both directions: the syntactic structure needs to be licensed by explicit content to be interpretable at the

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[13] The system as described here is very similar in spirit to the constructionalist approach to argument structure also found in Erteschik-Shir and Rapoport (this volume). The first-phase syntax goes along with a predictable compositional semantic interpretation, and arguments are interpreted relative to the sub-events that they specify. More detailed semantic information from the lexical encyclopedic content of the individual verbs is simply unified with this more systematic template, according to the constraints of plausibility and real-world knowledge.

interface; the lexical item can only associate with a node that matches the category features it is listed with. The category labels or 'tags' on lexical items are the only information we will find necessary to regulate their use, and moreover the minimal nature of the syntactically relevant information they have will be part of the solution to 'flexible' lexical use within a language.[14]

While the details of the implementation are beyond the scope of this particular paper (see Folli and Ramchand (2002) for a detailed syntactic implementation of lexical selection), the main intuition is the following: if the lexical item is specified as having the particular category feature (*v*, V or R or some combination), the corresponding syntactic structure is licensed; nominal arguments are merged in the specifier positions of licensed projections, and get the interpretation given by the union of the semantic compositional rules and the encyclopedic information carried by the specific lexical item.

As we have seen, the specifier positions are interpreted systematically by the general semantic component as Initiator, Undergoer, and Resultee respectively. There are thus no thematic roles, only three universal semantic rules triggered by syntactic structure. One major departure this proposal will make from other systems is that these specifier positions are not claimed to be mutually exclusive. In other words, it is possible for a single argument to be in more than one of these positions simultaneously (or have them linked together in an A-chain). This means that we are assuming that there is no θ-criterion, and that the semantic interpretations of the positions so linked get unified. In principle, there is no incompatibility between the semantics of Initiator, Undergoer, Resultee, and so no violations will occur purely because of unification.

With respect to the particulars of the first-phase syntax proposed, the elements of the ontology are those which have proved over the years to be minimally necessary to express the linguistically relevant argument structure and aspectual distinctions found in natural language. Thus, causation has been shown to be a relevant parameter in verbal differences, and shows up very

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[14] Once again, there are aspects of this system that are reminiscent of the principle of Full Interpretation as invoked by Erteschik-Shir and Rapoport (this volume). Their locational or state features correspond to a verb that is specified with an R feature, and Manner in their terms is mostly closely associated with the Process node. The differences lie in the details of the implementation: the system we follow here uses only syntactic category labels (which are *interpreted* in particular ways), and does not make use of lexicon-specific linguistically relevant features. In addition, the Process head in Ramchand (2003) is already interpreted as a 'path', without the addition of a plurality operator, and the point transitions are simply degenerate versions of 'path'. In Ramchand (2003), a plurality operator over events is not necessary for scalar or degree changes, but only for genuine cases of iterativity and distributivity.

often as overt morphology within the verbal inventory of human languages (cf. Baker 1988; Hale and Keyser 1993; Ritter and Rosen 1998; Rappaport Hovav and Levin 2000; Doron, this volume; Travis, this volume). Telos or resultativity is also a component which has been shown to be isolable as a parameter in verbal meanings, and which has associated morphology and case marking reflexes in various languages (see e.g. Tenny 1994; Kiparsky 1998; van Hout 1996; Ritter and Rosen 1998; Borer 1998). The decomposition proposed here takes those generalizations seriously, and explicitly encodes sub-events to represent each isolable component, each correlated with a functional projection in the 'first-phase syntax'. The projection VP, corresponding to the process component, is the only one that we consider to be obligatory for all (non-stative) verbs since it represents the concept of change, a crucial component of any non-stative (in its most degenerate version it can reduce to a single transition, but this for us still counts as change/process). The concept of change in this extremely general sense is a presupposed condition for the concepts both of initiation and of result state.

We exploit these ideas of event structure decomposition and use the Hindi/Urdu V-V constructions as a test-bed for the formulation proposed here of the syntactic conditions on the ways that event-building can occur in the grammar. We believe that causation and telic pair formation are the fundamental semantic combinatorial operations available in the grammars of natural language, and that they are more primitive than other sorts of semantic relationship that can obtain between events. We believe further that the complex predicate data from Hindi/Urdu provides direct justification for the nature of the decomposition proposed here and its relationship to syntactic representation. The explicitly constructionalist view taken is also important because only such a view is able to make sense of the event structure flexibility of lexical items.

6.6 Analysis

6.6.1 *The let type: light verb as v*

Recall that the 'let' type of construction showed syntactic evidence for monoclausality while still maintaining the two verbs as separable syntactic, semantic, and prosodic elements. We therefore cannot assume a direct theta-marking relationship between the event introduced by V1 and that introduced by V2 for these constructions, since that would give rise to two distinct predicational domains. Further, the light verb cannot simply be a traditional kind of auxiliary, because it has an effect on the argument structure and case marking properties of the clause.

In fact, if we inspect the relevant sentences closely, such as those shown in (40), we can observe a number of interesting semantic characteristics.

(40) a. nadya=ne   ɑ njʊm=ko   nɪkɑ l-ne   di-ya
          Nadya.F=Erg Anjum. F=Dat emerge-Inf.Obl give-Perf.M.Sg
          'Nadya let Anjum get out.'

      b. ɑnjʊ m=ne   saddɑf=ko   xɑt   lɪk^h-ne   di-ya
          Anjum.F=Erg Saddaf. F=Dat letter.M.Nom write-Inf.Obl give-Perf.M.Sg
          'Anjum let Saddaf write a letter.'

In all these cases, the arguments related to V1 include everything but the subject. The subject, on the other hand, is the external agent or causer of the whole V1 event. Moreover, the specific mode of causation (facilitation in the examples above) depends on the specific choice of V2.

Hindu/Urdu also possesses explicit morphemes (-a/-va) which indicate general causation. When the V1 verbs in the examples above are causativized using this morpheme, they can give rise to the same argument structure and case-marking pattern as in the light verb constructions: compare (40a) with (41a), and (40b) with (41b).[15]

(41) a. nadya=ne   ɑnjʊm=ko   nɪkal-a
          Nadya.F=Erg Anjum.F=Acc emerge.Caus-Perf.M.Sg
          'Nadya pulled Anjum out.'

      b. ɑnjʊm=ne   saddɑf=ko   xɑt   lɪk^h-va-ya
          Anjum.F=Erg Saddaf.F=Acc letter.M.Nom write-Caus-Perf.M.Sg
          'Anjum had the letter written for Saddaf/taught Saddaf to write the letter.'

---

[15] With the -va causative it is also possible to have an optional instrumental marked argument, either in addition to the -ko marked argument, as in (ii) below, or instead of it as in (i). This instrumental can be interpreted as a demoted agent.

(i) nadya=ne   (ɑnjʊm=se)   xɑt   lɪk^h-va-ya
     Nadya.F=Erg (Anjum.F=Inst) letter.M.Nom write-Caus-Perf.M.Sg
     'Nadya had the letter written (by Anjum).'

(ii) nadya=ne   ɑnjʊm=ko   (yassin=se)   xɑt   lɪk^h-va-ya
     Nadya.F=Erg Anjum.F=Acc (Yassin.M=Inst) letter.M.Nom write-Caus-Perf.M.Sg
     'Nadya had the letter written for Anjum/taught Anjum to write the letter (by Yassin).'

We have nothing to say about these constructions here, beyond noting that the case-marking patterns which parallel the complex predicate can also be found with causatives. See Butt (1998) and Saksena (1980; 1982) for a more detailed discussion of causativization patterns in Hindi/Urdu.

We believe it is no accident that causative semantics is associated with this type of light verb which displays the paradoxical properties we have outlined. If the light verb were actually part of the first-phase syntax (or 'lexical syntax' in the Hale and Keyser sense), it would contribute the kind of meaning most commonly found within lexical items. It would show great integrity with the other portions of the first-phase syntax, and affect the case-marking and argument structure of a single 'monoclause'. Since it is part of the event structure decomposition of the 'e' bound by tense, it will not show the properties of modifying auxiliaries or contribute to 'external aspect' (in the Verkuyl (1972) sense); rather, it will contribute to the Aktionsart of the basic verbal event. We predict further that such an element would be distributionally and behaviourally distinct from heads that are external to the vP phase (auxiliaries). In addition, given the head-final typological character of this language, we find that the structure of the first phase syntax (proposed for independent semantic and linguistic reasons) predicts that a lexically instantiated little v head, bearing causative semantics and determining the properties of the external argument, would *follow* a main verb that instantiated the V head.

For these reasons, we assume that constructions of the 'let' type are complex lexical structures where the light verb (V2) is an overt instantiation of little v (see Diesing (1998) for a related proposal in which light verbs are situated in a special projection), and V1 is the main verbal predicate. Thus, the macro-event 'write-let' represents two sub-events, that of instigating an action (e2, the cause), which introduces an agent and implies the caused event e1, i.e. the writing.
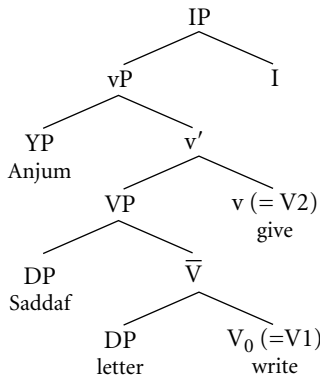
In the representations that follow, we augment the argument structures of the individual pieces of the complex event to indicate the arguments associated with each sub-event. We assume (following Ramchand 2003) that the verbs of the 'write' type encode two sub-events; the two arguments associated with 'write' are the specifier of the writing initiation (Initiator) and the process phrase's measure complement, which describes the path of the writing event.[16]

(42) V1=V=write(e; y, z) V2=v= Cause$_{allow}$(e'; x, e'')

$\exists$e: e = e2 $\rightarrow$ e1 [write(e1; 'Saddaf', 'letter') & Cause$_{allow}$(e2; 'Anjum', e1)]

'Anjum is the causer/allower of a sub-event of Saddaf writing a letter.'

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[16] See Ramchand (2003) for a more detailed description of how different types of verb are represented in a system of first phase syntax. The only details relevant to our analysis here are the separation of the external argument and the little v head from the rest of the event structure decomposition.

As can be seen from the syntactic representation in (43), this analysis straightforwardly also accounts for the unmarked word order of the construction, and both the separability yet integrity of V1 and V2.

(43)

```
                        IP
                       /  \
                      vP    I
                    /    \
                  YP      v'
                Anjum    /  \
                        VP    v (= V2)
                       /  \      give
                     DP    V̄
                   Saddaf /  \
                        DP    V₀ (=V1)
                      letter    write
```

Another virtue of the analysis is that it can be immediately extended to account for some other constructions which show the same morphology as the 'let' construction shown above, but whose existence is not predictable under other approaches. In examples such as (44) below, we find two verbal heads but only one argument (as opposed to the construction above, where a causer argument was introduced).

(44)   nadya   ro-ne   lɑg-i
       Nadya.F.Nom cry-Inf.Obl be.attached-Perf.F.Sg
   'Nadya began to cry.'

Because of the productive and essentially syntactic nature of our solution, we predict these examples to exist, once we allow for the possibility of a little *v* that is equivalent to a 'raising' head in specifically disallowing an external argument. The little *v* head in question (instantiated by the light verb *lɑg* 'attach') introduces the causing event, but introduces no explicit causer. In fact, these constructions end up having what has been called 'inceptive' semantics, where the main sub-event comes into being with the external cause remaining unspecified.

The analysis is as follows: there is some situation e2, as expressed by the *v* head, which brings about the e1 event. The aspectual verb in *v* is still consistent with the general semantics of causation, but lexically provides a more specific semantics, that of inception.

(45) V1=V=cry (e; x) V2=v=Begin(e′; e″)

$\exists e: e = e_2 \rightarrow e_1$ [crying(e_1; 'Nadya') & Begin(e_2; e_1)]

'Nadya begins to cry'

Since the specifier of *v*P is not assigned, the argument of 'cry' eventually raises and is grammatically realized as the subject, presumably by being associated with some feature in the Inflectional domain.

(46)
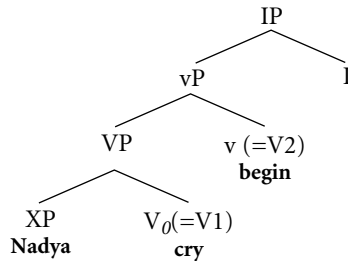
We expect that, due to Saussurean arbitrariness, there is nothing in principle which limits how specific the semantics of the light verb instantiating *v* can be. The only constraint is that it should be some sort of mode of causation. The different light verbs we find in Hindi/Urdu which participate in the 'let' type construction (uniquely and independently identifiable by the morphology on the main verb) all have some flavour of initiational or causative semantics, although a detailed examination of all the different versions is precluded by considerations of space here.

6.6.2 *The result type: light verb as V*

In this section we return to the question of the representation of the 'result' type of complex predicate. Recall that these V-V sequences also exhibited syntactic and semantic integrity with respect to our predicational diagnostics, which once again commits us to a monoclausal structure, even though these light verbs are clearly not auxiliaries. In addition, the 'result' type constructions seem to have accomplishment interpretations, regardless of the particular choice of light verb involved.[17] Semantically, then, this is an example of productive accomplishment formation.

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[17] As mentioned, light verbs in 'result' complex predicates contribute many other semantic dimensions (e.g. benefaction, forcefulness, suddenness) to the predication. Butt and Geuder (2001) treat the contribution of this additional information as a type of adverbial modification, an approach compatible with the approach taken in this paper. However, we do not specify a treatment of these extra semantic dimensions here, as our focus is on the mechanisms of event-building.

Once again, we believe the apparent paradox of the behaviour of these constructions can be resolved if we see the meaning composition as being related to the event structure decomposition that takes place in a first-phase syntax. We do not believe it is an accident that the creation of accomplishment semantics is associated with the paradoxical properties we have found. The first-phase syntax motivated in the previous section, drawing on many empirical observations in the literature concerning argument structure alternations etc., isolates telic augmentation as one of the crucial modulations between related lexical items (either through productive morphological processes or even through 'null' derivation). Here we find that very same modulation, but this time mediated by the use of a light verb in a V-V construction. The collocation in question has properties that indicate integrity with respect to determining argument structure and event structure properties, just as one would expect from a single lexical item.

We take this as further confirmation of the linguistic reality of the decomposition of so-called 'lexical' meanings that we are calling first-phase syntax. The test of the specific proposal lies in the very clear predictions it makes about the syntactic form of an accomplishment predicate if it were to be composed of distinct heads. Under the proposal being entertained here, the RP is the lowest down in the hierarchical ordering within the first-phase syntax. We would therefore expect, in a descriptively head-final language, that the individual piece of the structure that represents the final state attained would be linearly the first element of the construction. This is indeed what we find. In the 'result' type, the main verb V1 describes the final state achieved as a result of the event.

(47) a. nadya=ne   xɑt   lɪkʰ **li-ya**
         Nadya.F=Erg letter. M.Nom write take-Perf.M.Sg
         'Nadya wrote a letter (completely).'

     b. nadya   **gɪr ga-yi**
         Nadya.F.Nom fall go-Perf.F.Sg
         'Nadya fell (down).'

In (47a) a process occurs instigated by Nadya, as a result of which a letter comes to be written. In (47b) the result of the process here is that Nadya ends up 'down' or 'fallen'. If we take the semantics seriously, 'written' in the first case, and 'fallen' in the second must end up under the R head in the first-phase syntax, since it describes the final state. In a closely related lan-

guage, Bengali, the very same class of accomplishment complex predicates is found; but in this language the morphology is clearer, in that the V1 in the combination actually shows explicit perfective participial morphology (48), indicating the description of a result.
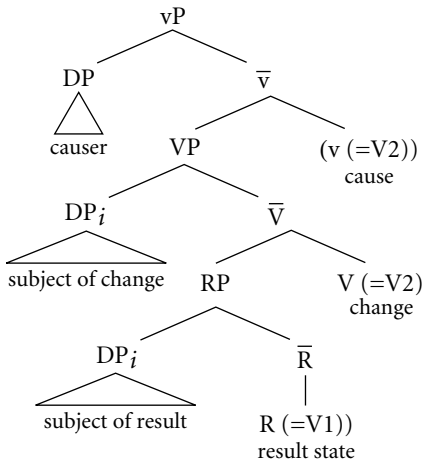
(48)   ruma   ci ʈʰi-ʈa   **likʰ-e**   **pʰello**
         Ruma.Nom letter-Classifier write-PerfPart throw.3.Past
         'Ruma wrote the letter completely.'

Note that analysing the V1 here as an R-head is superficially at odds with the descriptive statement in the literature that the light verb in these constructions is what is responsible for adding the telicity (see Hook 1991; Singh 1994). However, the descriptive statement can easily be reconciled with the facts once we realize that it is the light verb that selects for an RP in this structure and thus in a way *is* responsible for the accomplishment reading, although the actual description of the final state achieved is V1. In fact, we can see that the crucial contribution of the V2 here is as the process descriptor, since it is this head that selects the RP. The existence of a little *v*, or causing component, is not essential to this particular construction. In (47a) the complex predicate indicates a caused process that achieves a particular final state, but in (47b) there is no causer, just a process that is undergone and gives rise to a final state. In (47b), the light verb is an 'unaccusative' verb, which we take to mean that it does not identify a little *v* head at all.

If the V1 describes the final state achieved, then V2 must be responsible for instantiating the process head at least, and possibly the little *v* causational head as well in the case of light verbs derived from transitives. It is not unusual in itself for a single lexical item to identify both V and *v*, since under a decompositional account this is what main verbs do all the time. However, since the result of the process is V1, this forces the cause–process component of the meaning to be fairly abstract—in fact, light verbs like 'take' , 'give', and 'go' found in this construction have fairly general meanings. Thus, we propose that the schematic representation for a forms like (47a) would be as in (49). The contribution of the V2 in (50) is to provide the process part of the event (and also the *v* portion when it exists) while V1 represents the final state achieved.
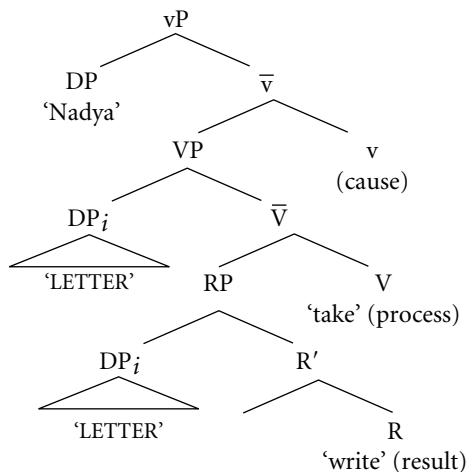
(49) $e: e = (e_1 \rightarrow) < e_2, e_3 >$

(50)

```
                        vP
                    ┌────┴────┐
                   DP          v̄
                   △       ┌────┴────┐
                 causer    VP       (v (=V2))
                       ┌────┴──┐     cause
                      DPᵢ        V̄
                      △      ┌────┴────┐
              subject of change RP    V (=V2)
                         ┌────┴──┐    change
                        DPᵢ       R̄
                        △         │
                subject of result  R (=V1))
                                  result state
```

A sample analysis of (47a) in terms of this notation is as in (51).

(51) $\exists e: e = e_1 \rightarrow< e_2\ e_3 > [\text{CAUSE}_{take}(e_1;\ \text{'Nadya'}) \ \&\ \text{PROCESS}_{take}\ (e_2;\ \text{'letter'}) \ \&\ \text{RESULT}_{written}\ (e;\ \text{'letter'})]$

'Nadya instigates a process affecting a letter which has the result that the letter comes to be written.'

Another important thing about the semantics of this construction, which can be noticed from the representation above, is that the argument that is said to undergo the change is the very same as the argument that achieves the final state, and that this identification is obligatory. We surmise that the identification of the specifier positions of RP and VP is a precondition for the semantic combinatoric operation of telic augmentation.

(52)

```
                        vP
                    ┌────┴────┐
                   DP          v̄
                 'Nadya'   ┌────┴────┐
                          VP          v
                      ┌────┴──┐    (cause)
                     DPᵢ        V̄
                     △      ┌────┴────┐
                  'LETTER'  RP        V
                        ┌────┴──┐  'take' (process)
                       DPᵢ       R'
                       △      ┌────┴──┐
                   'LETTER'            R
                                   'write' (result)
```

Under this view, the V2 verb *liya* 'take' is the spell-out of the head which is base-generated in V and moves up to *v*, while the V1 verb *lik*[h] 'write' is base-generated under R. Under the view of compositional event roles outlined in the previous section, the internal argument must be base-generated in Spec, RP since it is the holder of the resulting state, but a copy is also merged in the specifier of VP, since it is the entity undergoing the change.[18] The word-order facts of the language make it impossible to show exactly where the DP in question is spelled out, since in principle either location would be consistent with preverbal order. In general terms, however, it is striking that the structure of the first-phase syntax proposed makes exactly the right predictions for the order in which the subevents are instantiated, assuming head-finality for this language.[19]

6.6.3 *Differences between the 'let' and 'result' types of complex predicate*

Comparing the structures proposed for the 'let' type and the 'result' type, both constructions deserve the label of 'complex predicate', because in each type the two verbal heads are instantiations of heads within the first-phase syntax. This gives them a privileged status in the constructing of the core event at the heart of the proposition, and in the determination of argument structure and case-marking. They demonstrate an internal integrity which is often found within single lexical items in better-known European languages.

There is a difference between the two types as well: in the 'let' construction, the light verb is simply the little *v* head and it determines its own 'causer' argument in Spec, vP; in the 'result' construction, the light verb instantiates the process head and the main verb the result head, but the argument in Spec, RP is the same as the argument in Spec, VP. Essentially, while in the 'let' construction it is possible to separate the contribution of the two parts of the complex predicate cleanly, each with its own arguments, in the 'result' construction, separating the light verb from the main verb would mean separating a verb from its direct argument.

There is in fact evidence for a difference in movement possibilities when the two constructions are compared closely with respect to scrambling. As we indicated before, both constructions can feed a topicalization structure where the light verb is fronted. In simple scrambling constructions, however scrambling of the main verb with its object away from the light verb is possible in the 'let' complex predicate (53), but not in the 'result' complex predicate (54).

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[18] Another way to think of this is in terms of Remerge (Starke 2001), which is the position taken in Ramchand (2003), although nothing hinges on the distinction here.

[19] Or whatever movements conspire to achieve that effect (e.g. Kayne 1994).

(53) a. ɑnjʊm=ne   saddaf=ko   cɪṭṭʰi   [lɪkʰ-**ne**   **d-i**]
          Anjum.F=Erg Saddaf.F=Dat note.F.Sg.Nom write-Inf.Obl give
          Perf.F.Sg
          'Anjum let Saddaf write a note.'

      b. ɑnjʊm=ne **d-i** saddaf=ko cɪṭṭʰi lɪkʰ-**ne**

      c. ɑnjʊm=ne cɪṭṭʰi lɪkʰ-**ne** saddaf=ko **d-i**

(54) a. nadya   xɑt=ko   lɪkʰ   l-e-g-i
          Nadya.F.Nom letter.M=Acc write take-3.Sg-Fut-F.Sg
          'Nadya will be able to write a letter.'

      b. *nadya   lɪkʰ   xɑt=ko   l-e-g-i
          Nadya.F.Nom write   letter.M=Acc take-3.Sg-Fut-F.Sg
          'Nadya will be able to write a letter.'

Although we do not have a specific syntactic analysis to offer here, we are confident that this pattern can be captured under an analysis where the direct object is licensed both by the light verb head and by the main verb head in the 'result' complex predicate, but just by the main verb head in the 'let' complex predicate. The difference between topicalization and scrambling would be that the former, but not the latter, 'reconstructs' (perhaps indicating that only the former is an actual movement process whereas the latter involves base generation).

Other differences between the two types of complex predicate go in the same direction: the 'result' type shows more internal cohesion, while the 'let' type has more semantic and syntactic separability. Specifically, we find that modification by negation (and adverbials more generally) affects the two constructions differently, giving ambiguity in the 'let' case but not in the 'result' case. The example below makes the point with negation, where only one reading for (55) is possible. The default placement of sentential negation is to the left of the verbal complex.

'RESULT' COMPLEX PREDICATES: ONLY NEGATION OF THE VERBAL COMPLEX IS POSSIBLE

(55) a. nadya   xɑt   nahĩ   lɪkʰ   l-e-g-i
          Nadya.F.Nom letter.M.Nom not   write   take-3.Sg-Fut-F.Sg
          'Nadya will not be able to write a letter.'

      b. nadya   xɑt   lɪkʰ   nahĩ   l-e-g-i
          Nadya.F.Nom letter.M.Nom write   not   take-3.Sg-Fut-F.Sg
          'Nadya will not be able to write a letter.'

In the 'let' complex predicate negating the sentence gives rise to two different possible readings depending on whether V1 or V2 is interpreted as being negated. In (56a) and (56b) differing placement of the negative particle gives rise to different interpretations. The default placement of the negative as in (56a) gives rise to genuine ambiguity.

<small>'LET' COMPLEX PREDICATE: NEGATION OF EACH INDIVIDUAL VERB IS POSSIBLE</small>

(56) a. ɑnjʊm   sɑddɑf=ko   har   nahĩ [**bɑnɑ-ne**
           Anjum.F.Nom Saddaf.F=Dat necklace.M.Nom not make-Inf.Obl

           d-e-g-i]

           give-3.Sg-Fut-F.Sg

           'Anjum will not let Saddaf make a necklace.'

           'Anjum will let Saddaf not make a necklace.'

      b. ɑnjʊm   sɑddɑf=ko   har   bɑnɑ-ne   nahĩ
           Anjum.F.Nom Saddaf.F=Dat necklace.M.Nom make-Inf.Obl not

           d-e-g-i]

           give-3.Sg-Fut-F.Sg

           'Anjum will not let Saddaf make a necklace.'

      c. ɑnjʊm   har   nahĩ **bɑnɑ-ne**   sɑddɑf=ko
           Anjum.F.Nom necklace.M.Nom not make-Inf.Obl Saddaf.F=Dat

           d-e-g-i

           give-3.Sg-Fut-F.Sg

           'Anjum will let Saddaf not make a necklace.'

Again, we do not have a specific analysis of the syntax and semantics of negation, but one account of the difference between the two constructions would relate to the difference in constituency within the two vPs: in the 'let' case there are two separable sub-events defined by the different verbal heads; in the 'result' case the sub-events licensed by the light verb and the sub-event licensed by the main verb have an argument in common, and are therefore not semantically separable in the relevant sense. The other possible account would be to say that negation (and other adverbials) can adjoin vP and VP but not RP. In any case, it seems to be a general fact about lexical accomplishments that the process and the result are not separably modifiable (indeed, these sorts of fact provided one of the most widely cited arguments against early generative semanticist decompositions of lexical items, and are used even now against them (cf. Fodor and Lepore 2002)). It is interesting that even in Hindi/Urdu, where the 'accomplishment' is being constructed from separate lexical pieces,

which can even be independently topicalized, ambiguity under adverbial modification is not found. This indicates (*contra* Fodor and Lepore 2002) that the lack of ambiguity is due to some structural property of first-phase syntax, rather than to the 'integrity' of a lexical item *per se*.

6.6.4 *More complex embeddings*

There is yet another obvious prediction that the specific syntax of the first phase makes. Given the existence of three heads in our first-phase syntax decomposition, we predict that it should also be possible to fill all three heads explicitly with lexical items. This indeed turns out to be the case, with examples like (57) below. It is important to note that the prediction here is quite specific: the heads should combine in the linear order R, V v. In other words, in a three-headed complex predicate V1 should take the bare form (being under R), V2 should be the inflected infinitive (being under V) and V3 should be the tensed causative verb v. This is exactly the combination that is attested, as shown in the example below.

(57) nadya=ne   saddɑf=ko   xɑt   **lɪk^h le-ne   di-ya**
      Nadya.F.Sg=Erg Saddaf.F.Sg=Dat letter.M.Nom write take-Inf.Obl give-
      Perf.M.Sg

      'Nadya let Saddaf write a letter (completely).'

(58)
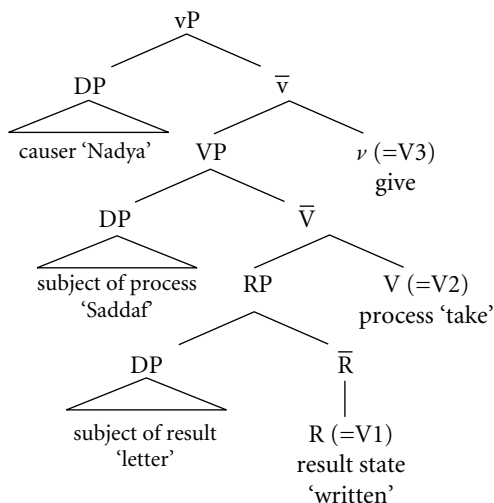
The opposite combination, where a 'let'-type complex predicate is nested inside a 'result'-type complex predicate is predicted to be ungrammatical

because the 'let' light verb instantiates a v and thus 'closes off' the functional complex. The result-type light verb, on the other hand, only optionally instantiates v (but always instantiates V), so that it is possible to stack another light verb on top. To put it more concretely, while we would expect to find the 'let' light verb as the last predicative member of a verbal complex, we would not expect the opposite, i.e. a V1 in the oblique infinitive form, a V2 in the bare form followed by a tensed V3. Once again, this prediction is borne out and an example is shown in (59). Two versions are shown, one with *le* 'take' as the finite light verb in (59a) and one with *de* 'give' in (59b). (59a) combines exactly the same verbs as in (56a), but is bad. (59b) tries out the same pattern of combination with the string *de diya* 'give gave', because this is a frequently occurring collocation and could therefore have been expected to produce better results. However, this was not the case.[20]

(59) a. */???nadya=ne   saddaf=ko   xɑt   **lık^hne**   **de**
          Nadya.F.Sg=Erg   Saddaf.F.Sg=Dat letter.M.Nom write-Inf.Obl give
          li-ya
          take-Perf.M.Sg
          'Nadya completely let Saddaf write a letter.'

      b. */???nadya=ne   saddaf=ko   xɑt   **lık^hne**   **de**
          Nadya.F.Sg=Erg   Saddaf.F.Sg=Dat letter.M.Nom write-Inf.Obl give
          di-ya
          give-Perf.M.Sg
          'Nadya completely let Saddaf write a letter.'

To summarize, we think that a structurally compositionalist syntactic analysis of complex predicates is the most successful at dealing with the syntactic, semantic, and word-order properties of these two types of V-V collocation. The special status of first-phase syntax as the decomposition of the components within the core event structure of the clause accounts for its special properties in terms of the determination of argument structure, case-marking, and Aktionsart, and also for the parallels to single lexical items across languages. The syntactic approach, in addition, makes specific predictions about the interpretation, morphology, and distributional properties of the individual lexical components that could be used to build up vPs in languages that have the appropriate lexical ingredients. Hindi/Urdu is such a language, and its complex predicates provide a wealth of data confirming many of those predictions.

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[20] We would like to thank Rajesh Bhatt for confirmatory judgements in this matter.

6.7 Conclusion

We have argued that there are three distinct types of V1-V2 construction in Hindi/Urdu. Using the syntactic diagnostics made available by the language, we argued that one type, the 'tell' type, was a case of genuine syntactic and semantic subordination. The other two types are what we would call 'complex predicates', in the sense that V1 and V2 combine to form a single complete functional complex. In the 'let' type, we argued that V1 and V2 were lexical instantiations of V and v in the lexical structure respectively. In the 'result' type, we found that V1 and V2 instantiate R and V/(v) respectively, where R was the head of the projection representing the final state achieved by the direct object. We were able to account for the (sometimes surprising) aspectual readings within these complex predicates precisely because our view of event-building allows us to posit a more complex interaction between parts of the syntax and the semantics.

If our analysis is correct, complex constructions in Hindi/Urdu are a test case which therefore offers striking syntactic, semantic, and morphological evidence in favour of an event-structure decomposition of the form proposed here, 'causation → process, result', which can be seen to underlie verbal predication in natural language.

The first-phase syntax proposed here makes use of three basic components, or sub-events, that are central to the analysis of these phenomena: the causing sub-event, vP; the process sub-event, VP; and the result state sub-event, RP. All of these components seem to be independently attested in the world's languages, either within lexical items or across lexical items, where they give rise to the kinds of paradoxes and clause union behaviour we have found for Hindi/Urdu. We speculate that in addition to complex predicates in this and other languages, productive morphological causativization and resultatives can be profitably analysed using the same framework (see Folli and Ramchand (2002) for resultatives and goal-of-motion constructions in Italian and English; Dobnik (2002) for causative clause union in Slovene; Ramchand and Svenonius (2002) for an analysis of the verb-particle construction in Germanic and Scottish Gaelic; and Butt and Scott (2002) for an analysis of complex predicates in Chinese). The first-phase syntax decomposition we propose and justify here makes quite specific predictions concerning the types of productive and compositional complex predication possible in natural languages, and the way in which they will be manifested syntactically. We leave extensions and modifications of this framework to further research.

One important corollary of this approach is that the notion of the lexicon and lexical information has been decomposed. We think that this more structurally compositionalist view of the lexicon is justified in the light of the complex predicate data found in this and other languages.

7

The Aspect of Agency

EDIT DORON

7.1 Thematic vs. temporal aspect

Aspect is the internal structure, either temporal or thematic, imposed by verbs on the described eventuality. This chapter argues that the templatic verbal morphology of Semitic languages encodes thematic rather than temporal aspect. It therefore provides further support to the view expressed by Rappaport-Hovav and Levin (this volume) that there are important lexical meaning distinctions between linguistically relevant classes of verbs which are not reducible to temporal aspect.

Traditionally, verb stems in the Semitic languages are analysed as two separate morphemes, the root and the template. I will show how this morphological analysis functions as the encoding of thematic aspect. The thematic contribution of the verb's internal arguments is encoded by the root, whereas the thematic role of the verb's external argument, which I call 'agency', is encoded by the template. It will be shown that two different types of agency are marked by Semitic templates: cause vs. actor. The marking of the cause thematic role as distinct from the more agentive type of thematic role, here called actor, is also documented for other languages by two additional articles in the present volume: Tagalog and Malagasy by Travis and Hindi/Urdu by Butt and Ramchand.

In the second section of the chapter, I show that the marked values of the agency dimension, cause and actor, are expressed by the so-called causative and intensive templates respectively. The third section describes the system which compositionally constructs the meaning of verbs from the

meanings of their root and template. Finally, the fourth section accounts for the variation in the grammatical functions of the causee in causative constructions.

7.2 Two types of agency: cause versus actor

Traditionally, the lexicon of Semitic languages is viewed as consisting of consonantal roots, and words are constructed from the roots by combining them with other morphemes realized as the templates. While there are many templates which derive nouns from roots, the verbal system is extremely limited. Setting aside voice variation, each verb in Semitic is derived by one of exactly three templates, traditionally known as the simple template, the intensive template, and the causative template. Though the template system is in principle the same in all the Semitic languages, the actual forms vary from language to language. The present study is based on the forms found in Hebrew, shown in (1):

(1)   The active voice

    a. the simple template   CaCaC

    b. the intensive template   CiC(C)eC

    c. the causative template   hiCCiC

The choice of template is mostly arbitrary if a unique verb is derived from the root. In other words, the template does not make a semantic contribution if there is no contrast between different verbs derived from the same root. But where there is alternation between equi-rooted verbs, a clear semantic contribution can be detected from the template. For example, three different verbs are derived from the single consonantal root *rqd* 'dance'. One verb is derived by combining this root with the simple template, yielding the simple verb *raqad* 'dance'. A second verb is derived by combining the root with the intensive template, yielding the intensive verb *riqed* 'perform dancing'. A third verb is derived by combining the root with the causative template, yielding the causative verb *hirqid* 'make dance'. The simple verb *raqad* is the unmarked verb, and it assigns its external argument an unmarked thematic role which I call 'agent' (not to be confused with the marked thematic role assigned to a participant which is the active performer of the event, often called 'agent' in other frameworks, but which I will call 'actor'). The simple verb does not indicate whether the dance was any more than a kind of motion undergone by the participant. The intensive verb, on the other hand, specifies that the dance was more than just motion, that it should be considered as an action actually

performed by the participant, thereby assigning it the role of actor. What counts as 'action' is not easy to explicate, and I take it to be a primitive natural concept encoded by the intensive template. I also assume that if an event is characterized as an action, then it has a participant which is an actor. Normally, but not always, an actor is sentient and in control of independent force, and action is forceful and deliberate; but these concepts are here left fuzzy. Lastly, the causative verb characterizes the dance by introducing an additional participant which is the cause of the event. Cause is a different way of participating in an event than actor. For example, music may cause a dance, but not perform it as an actor.

The basic generalization (to be fine-tuned as we go along) is that the intensive verb, when compared with the equi-rooted simple verb, does not involve an increase of valence relative to the simple verb, but only reclassifies the simple verb's external argument as an actor. The causative verb, on the other hand, involves an increase of valence, and introduces a new external argument with the thematic role of cause. Crucially, this pattern is never reversed in the language:

(2)	Root	Simple verb (intransitive)	Intensive verb (intransitive)	Causative verb (transitive)
	rqd	raqad *dance*	riqed *perform dancing*	hirqid *dance (trans.)*
	qpc	qafac *jump*	qipec *jump up and down*	hiqpic *jump (trans.)*
	ʿp	ʿaf *fly*	ʿofef *perform flying*	heʿif *fly (trans.)*
	hlk	halax *walk*	hilex *perform walking*	holix *walk (trans.)*
	šyt	šat *sail*	šiyet *perform sailing*	hešit *sail (trans.)*
	xzr	xazar *return*	xizer *court*	hexzir *return (trans.)*
	pqd	paqad *command*	piqed *issue command*	hifqid *put in charge*

Intensive verbs do not add an argument to the simple verb, but they add entailments to the effect that the event denoted is an action. As already mentioned above, the relevant notion of action does not imply sentience or volition, and therefore the actor (the agent of action) is not necessarily an animate being, but can on principle be any entity which exerts its own force. I do not formulate the precise lexical entailments which characterize a predicate of action. Yet I assume the explication of the predicate DO in Ross (1972) and Dowty (1979). Causation, which is often an intensional relation, is explicated by Lewis (1973). It should be noted that, as explained by Davidson (1971),

action cannot be reduced to causation, any more than causation can be reduced to action.

All this said, it is nevertheless true that many verbs which involve action do presuppose animacy by virtue of their meaning. They do so for actors (and other arguments as well) but, crucially, not for causes. Accordingly, if a particular verb requires its subject to be animate, we know that this subject is not a cause. Animacy requirements on subjects can therefore be used to easily identify action. A simple verb, on the other hand, may describe the same event as an intensive verb, but without ascribing action. Accordingly, a simple verb—but not necessarily an intensive verb—is equally good with an animate and an inanimate subject:

(3) a. ha-yeladim/   ha-mexirim   qafcu
     the children/   the prices   jumped -SIMPL
     'The children jumped.'   'The prices jumped.'

    b. ha-yeladim/* ha-mexirim   qipcu
     the children/ the prices   jumped -INTNS
     'The children/*the prices jumped up and down.'

    c. mašehu   hiqpic   et ha-yeladim/ et ha-mexirim
     something   jumped-CAUS   ACC the children / ACC the prices
     'Something made the children/the prices jump.'

The distinction in (3b) is expressible in English by using the main verb *do*, which only has an action meaning:

(4) a.   The girls jumped up and down after the boys did it.
    b. *The prices jumped up and down after the taxes did it.

I now introduce a correction of the generalization regarding the intensive template's effect on adicity. When the simple verb is unaccusative, the intensive template does involve a valence increase. Unlike the case of unergative and transitive simple verbs, where the intensive template assigns the actor thematic role to the external argument of the simple verb, in the case of simple unaccusative verbs there is no external argument, so the actor role is assigned by the intensive template to an additional argument. The intensive verbs in (5), which correspond to simple unaccusative verbs, are therefore just as transitive as the equi-rooted causative verbs:

(5)

Root	Simple verb (*unaccusative*)		Intensive verb (*transitive*)		Causative verb (*transitive*)	
pny	pana	*turn*	pina	*turn out*	hifna	*turn*
yc'	yaca	*come out*	yice	*export*	hoci	*take out*
gdl	gadal	*grow*	gidel	*grow*	higdil	*increase*
tb'	tava'	*drown*	tibea'	*drown*	hitbia'	*drown*
bq'	baqa'	*split*	biqea'	*split open*	hivqia'	*split*
t'm	ta'am	*match*	te'em	*coordinate*	hit'im	*match*
ngd	nagad	*contradict*	niged	*contrast*	hingid	*contrast*
bšl	bašal	*ripen*	bišel	*cook*	hivšil	*ripen*

We can verify that the additional argument of the intensive verb is not a cause, unlike the additional argument of the causative verb. In the following examples, the intensive verb can only be predicated of an animate subject. The causative verb, on the other hand, may be predicated of any kind of subject (including abstract subjects), as shown in (6)–(8):

(6) a. ba'alat-ha-bayit/ ha-avtala   hifneta   et   ha-dayarim le-liškat-
        the landlady/unemployment turned-CAUS ACC the tenants to the
        ha-avoda
        employment agency

     b. ba'alat-ha-bayit   pinta   et ha-dayarim
        the landlady   turned-out-INTNS   ACC the tenants

     c. *ha-avtala   pinta   et ha-dayarim
         unemployment   turned-out-INTNS   ACC the tenants

(7) a. medinot aniyot / maskorot nemuxot hoci'u
        poor countries / low wages   brought-out-CAUS
        po'alim   le-hafganot
        workers   to demonstrations

     b. medinot aniyot   meyac'ot   po'alim
        poor countries   export-INTNS   workers

     c. *maskorot nemuxot   meyac'ot   po'alim
         low wages   export-INTNS   workers

(8) a. ha-agronomit / eyxut-ha-qarqa   higdila   et ha-yevul
        the agronomist /the quality of the soil increased-CAUS ACC the crop

	b.	ha-agronomit	gidla	yeraqot
		the agronomist	grew-INTNS	vegetables
	c.	*eyxut-ha-qarqa	gidla	yeraqot
		the quality of the soil	grew-INTNS	vegetables

7.3 The compositional analysis of verb meaning

I now expand the formal semantic analysis of templatic morphology, also found and further motivated in Doron (2003): verbs are constructed in the syntax[1] by combining the root with different agency-heads, ι and γ, which, first, determine whether this will be a verb of action, a verb of causation, or unclassified for these dimensions, and which, second, may introduce an external argument.

By principles of distributed morphology (Halle and Marantz 1993; Marantz 1997), the syntactic combination of verb agency-head and is supplied a Vocabulary form by the morphological component of the grammar. Moreover, this model assumes an Encyclopedia, which contains semantic information special to particular syntactic combinations. It is well known that derivational morphology allows a certain amount of deviation from compositional meaning. We will see below that the more local the combination, the more idiosyncrasy is found in meaning. For example, the intensive agency-head ι combines directly with the root, whereas the causative agency-head γ combines with the root together with its arguments. Accordingly, the meaning of a root combined with the intensive template is more idiosyncratic than with the causative template. As a result, many intensive verbs are associated with rich encyclopedic knowledge—witness such intensive examples as *šilem* 'pay' (derived from the root *šlm* 'complete'), *xizer* 'court' (derived from the root *xzr* 'return'), *nice'ax* 'win' (derived from the root *ncx* 'eternity'), and many others.

Under the simplest conceivable form–meaning correspondence, every root R fused with ι should always be realized as an intensive verb, a root fused with γ should always be realized as a causative verb, and a root in isolation should always be realized as a simple verb. Yet this is true only in the default case. The default features of the templates are shown in (9).

(9) Templates   Default features

   INTNS $[+ι]$

   CAUS $[+γ]$

   SIMPL $[-ι - γ]$

---

[1] Word-internal syntax is perhaps part of the lexicon, as in Hale and Keyser 1993.

Crucially, templates can be specified to have marked features in the environment of certain roots. According to any existing model of morphology, forms specified for a particular feature override default forms, by the most basic 'elsewhere' consideration familiar at least since Kiparsky (1973). Therefore, idiosyncratic verbs have listed templates. The templates of these verbs are completely uninformative, i.e. the form–meaning correspondence is rendered as opaque as in the more familiar languages with poorer morphology. In addition, non-contrastive features are redundant, and therefore not marked, which explains why it is that verbs with unique stems tend to be idiosyncratic. If a single verb stem exists in the root, it will have no contrastive features and will therefore fit any combination of features which appears in the syntax. Accordingly, the template might as well be idiosyncratic.

(10) a. Causative-template verbs with non-causative meaning:

      hiqšiv   he'epil   hifcir

      listen-CAUS   climb-CAUS   urge-CAUS

      'listen'   'climb'   'urge'

   b. Intensive-template verbs with non-action meaning:

      bisem   siyem   pizer

      perfume-INTNS   end-INTNS   disperse-INTNS

      'perfume'   'end'   'disperse'

In addition, it is possible for marked features to be specific to particular environments, which may limit the syntactic feature combination that the template matches, often due to overriding phonological considerations dictating its template. For example, quadriliteral or reduplicated binary roots can only be derived by the intensive template, it being the only template which provides a slot for an extra consonant beyond the three customary ones. Accordingly, no alternation for the verb 'drip' (which has the reduplicated binary root *tp*) is morphologically overt. Both transitive and intransitive 'drip' share a single stem in the intensive template: *tiftef*. Of course, it does not follow in this case that the verb 'drip' is an action verb, which it is not in (11a, b) below. The same holds of *dg* 'tickle', shown in (12). Similarly, the stative verb 'like' with the binary root *xb*, which participates in the causative alternation, is derived under both variants by the intensive template, as shown in (13), but surely it is not a verb of action:

(11) a. qafe   tiftef   me-ha-berez

        coffee   dripped-INTNS from the faucet

   b. ha-berez   tiftef   qafe

        the faucet dripped-INTNS coffee

(12) a. medagdeg   li
          tickles-INTNS   to-me
          'I feel tickling.'

      b. ha-sveder   medagdeg   oti
          the sweater tickles-INTNS   me
          'The sweater tickles me.'

(13) a. ha-talmid   xibev   et ha-miqco'a
          the student   liked-INTNS   ACC the subject

      b. ha-sefer   xibev   al-ha-talmid   et ha-miqco'a
          the book   liked-INTNS   on the student   ACC the subject
          'The book made the student like the subject.'

Accordingly, the intensive template INTNS has the marked feature specification $[-\gamma]$ in the environment of the binary root *cl*, which means that the intensive verb *cilcel* 'ring' realizes the root either in isolation or in combination with the intensive agency-head, but not with the causative agency-head (since, similarly to English, this verb is either intransitive or transitive, but the subject of the transitive verb is strictly an actor). The table of marked choices of features shown in (14) expresses the fact that INTNS realizes the derivations involving non-tripartite roots such as *cl*, and other roots such as *tp*, *dg*, and *xb*.

(14)   Special environments   Marked features
       INTNS / _____ tp, dg ... $[\phi]$
       INTNS / _____ xb, ... $[-\iota]$
       INTNS / _____ cl, ... $[-\gamma]$

In addition, I adopt the idea of Hale and Keyser (1993) and Kratzer (1994) that the external argument of a verb is introduced in the unmarked case by the *light verb v*.[2] Under the present account, the internal arguments are arguments of the root R. Semantically, I take a root R to denote either a property of eventualities $\lambda e[R(e)]$ or a relation between individuals and eventualities, e.g. $\lambda x\lambda e[R(e,x)]$. The light verb head *v* relates an eventuality to its Agent (more precisely Proto-Agent in the sense of Dowty (1991)): $\lambda y\lambda e[Agent(e,y)]$. The agency-head ι classifies the eventuality as an action: $\iota = \lambda e[Action(e)]$. The agency-head γ relates an eventuality to its cause: $\gamma = \lambda y\lambda e[Cause(e,y)]$. This is summarized in (15).

---

[2] This idea has already been adopted for Hebrew in recent work: Simons (1996), Arad (1998), and Landau (1999; 2002), and more radically in the different aspectual model of Borer (1994; 1998).

(15)   Agency-head   Denotation   Default template   Licensing of *v*

    a. –   –   SIMPL   depends on R

    b. ι   λe[Action(e)]   INTNS   licensed

    c. γ   λyλe[Cause(e,y)] CAUS   not licensed

The thematic role that we have called Actor can be reduced to the thematic role of Agent (denoted by *v*), in events that are classified as Action by ι. This is expressed in (16).

(16)   Agent (e,y) & Action (e)   →   Actor (e,y)

It follows from the present approach that every intransitive active intensive verb is always unergative, since part of the specification of the intensive template is that of classifying the event as an action, which requires an external argument. This is indeed the case, as far as I can tell (e.g. *siyer* 'patrol', *nimnem* 'snooze', *bila* 'spend time', and many others).

According to Kratzer (1994), functional heads do not combine with their complements by the usual mode of function application, but by a different mode which she calls 'identification', following Higginbotham (1985). For example, identification takes place in (18) in the subtree where *v* and R are combined, according to the following rule:

(17)   ident $(\alpha_{<e, <s, t>>}, \beta_{<s, t>}) \equiv \lambda P \lambda y_e \lambda e_s[\alpha(e,y) \& P(e)](\beta)$

Combining *v* and R in (18) by identification is equivalent to applying $\lambda P \lambda y \lambda e[\nu(e,y) \& P(e)]$ to R. The other subtrees in (18) combine by function application. Note that I assume that the event argument is bound by a tense operator presumably higher in the tree, and that I use *x, y, z* ambiguously for variables and names.

As formulated in (15a), whether or not a simple verb contains the light verb *v* is a property of the root. The roots in (18) and (19) license *v*, whereas the root in (20) does not.

(18)   y raqad

    y dance-SIMPL   'y danced'

                 v   λe [dance (e) & Agent (e,y)]

                /   \

          y   *v*   λy λe [dance (e) & Agent (e,y)]

               /   \

  λy λe [Agent (e,y)]   *v*   [$_R$ rqd]   λe [dance (e)]
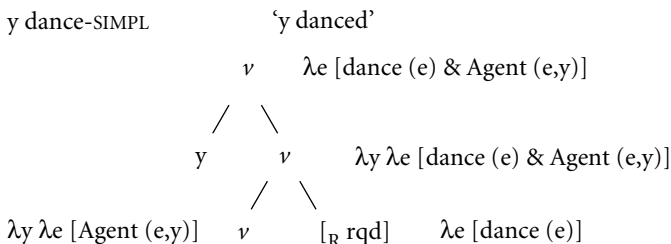
(19)

     y šavar   et x

     y break-SIMPL   ACC x   'y broke x'

$$v \quad \lambda e\ [break\ (e,x)\ \&\ Agent\ (e,y)]$$

$$y \qquad v \quad \lambda y\, \lambda e\ [break\ (e,x)\ \&\ Agent\ (e,y)]$$

$$\lambda y\, \lambda e\ [\ Agent\ (e,y)] \quad v \qquad R \quad \lambda e\ [break\ (e,x)]$$

$$x \qquad [_R\ \check{s}br] \quad \lambda y\, \lambda e\ [break\ (e,x)]$$
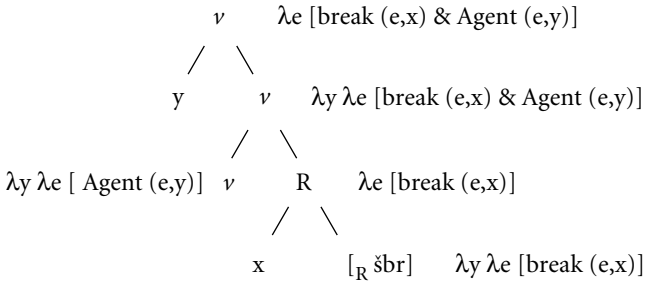
(20)

     x yaca

     x go-out-SIMPL   'x went out'

$$R \quad \lambda e\ [go\text{-}out\ (e,x)]$$

$$x \qquad [_R\ yc'] \qquad \lambda y\, \lambda e\ [go\text{-}out(e,x)]$$
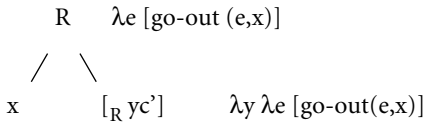
ι, on the other hand, licenses *v*, whether or not the root does (see (15b)). From the familiar requirement that the Agent role is assigned at most once per event, the Agent of (18) and (19) will be the same as the Actor of the corresponding intensive verbs in (22) and (23) below. On the other hand, the Actor of the intensive verb in (24), derived from the unaccusative structure in (20), is an additional argument, since the root in this case does not license *v*. This is summarized in (21).

(21)   a.   y dance-INTNS   →   y dance-SIMPL   (one Agent per event)

        b.   y break-INTNS x   →   y break-SIMPL x   (one Agent per event)

        c.   y go-out-INTNS x   −/→   y go-out-SIMPL x   (root does not license *v*)

(22)

y riqed

y dance-INTNS   'y performed dancing'

v λe [dance (e) & Action (e) & Agent (e,y)] $\subset$ λe [dance (e) & Actor (e,y)]
/ \
y v $\lambda y \lambda e$ [dance (e) & Action (e) & Agent (e,y)]
/ \
$\lambda y \lambda e$ [Agent (e,y)]v ι λe [dance (e) & Action (e)]
/ \
λe [Action (e)] ι [$_R$ rqd] λe [dance (e)]
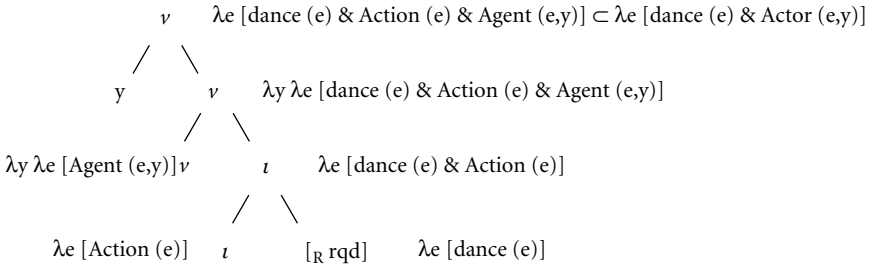
(23)

y šiber   et x

y break-INTNS   ACC x   'y actively broke x'

v λe [break (e,x) & Action (e) & Agent (e,y)] $\subset$ λe [break (e,x) & Actor (e,y)]
/ \
y v $\lambda y \lambda e$ [break (e,x) & Action(e) & Agent (e,y)]
/ \
$\lambda y \lambda e$ [Agent (e,y)] v ι λe [break (e,x) & Action (e)]
/ \
x ι $\lambda x \lambda e$ [break (e,x) & Action (e)]
/ \
λe [Action (e)] ι [$_R$ šbr] $\lambda x \lambda e$ [break (e,x)]
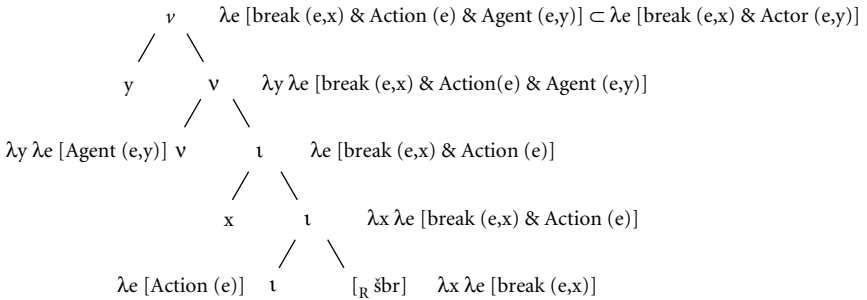
(24)

y yice   et x

y go-out-INTNS   ACC x   'y exported x'

v λe [go-out (e,x) & Action (e) & Agent (e,y)] $\subset$ λe [go-out (e,x) & Actor (e,y)]
/ \
y v $\lambda y \lambda e$ [go-out (e,x) & Action (e) & Agent (e,y)]
/ \
$\lambda y \lambda e$ [Agent (e,y)] v ι λe [go-out (e,x) & Action (e)]
/ \
x ι $\lambda x \lambda e$ [go-out (e,x) & Action (e)]
/ \
λe [Action (e)] ι [$_R$ yc'] $\lambda x \lambda e$ [go-out(e,x)]
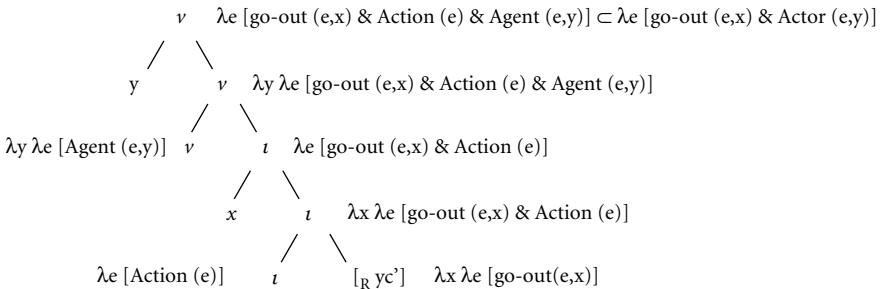
γ always introduces an argument with the thematic role of Cause, as formulated in (15c). The Cause relation is different from the Agent relation introduced by v. γ itself does not license v, and the argument it introduces is always a different argument from the subject of the simple verb, i.e. γ is not a modifier.

(25)   a. z dance-CAUS y $\rightarrow$ y dance-SIMPL   (root licenses Agent)

      b. z dance-CAUS y $-/\!\rightarrow$ z dance-SIMPL   (γ is not a modifier)

(26)

      z hirqid   et y

      z dance-CAUS   ACC y   'z made y dance'

$$
\begin{array}{l}
\gamma \qquad \lambda e\ [\text{dance}\ (e)\ \&\ \text{Agent}(e,y)\ \&\ \text{Cause}\ (e,z)] \\[4pt]
\ /\ \backslash \\
z \quad\ \gamma \qquad \lambda z\,\lambda e\ [\text{dance}\ (e)\ \&\ \text{Agent}(e,y)\ \&\ \text{Cause}\ (e,z)] \\[4pt]
\qquad /\ \backslash \\
\lambda z\,\lambda e\ [\text{Cause}\ (e,z)]\quad \gamma \qquad v \quad\ \lambda e\ [\text{dance}\ (e)\ \&\ \text{Agent}\ (e,y)] \\[4pt]
\qquad\qquad /\ \backslash \\
\qquad\quad y \qquad v \qquad \lambda y\,\lambda e\ [\text{dance}\ (e)\ \&\ \text{Agent}\ (e,y)] \\[4pt]
\qquad\qquad\quad /\ \backslash \\
\lambda y\,\lambda e\ [\text{Agent}\ (e,y)] \qquad v \qquad [_{R}\ \text{rqd}] \quad \lambda e\ [\text{dance}\ (e)]
\end{array}
$$
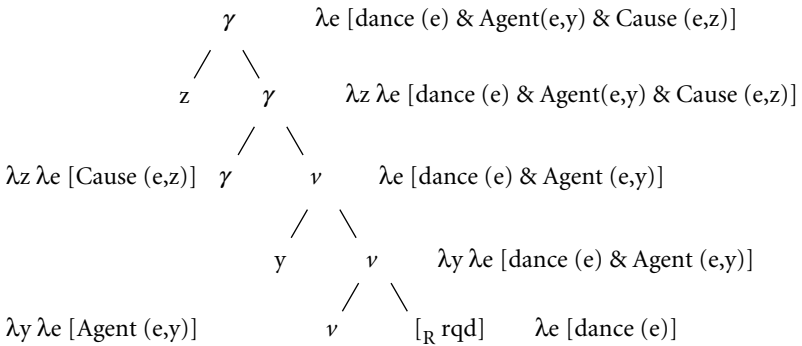
(27)

      z hoci   et x

      z go-out-CAUS   ACC x   'z brought-out x'

$$
\begin{array}{l}
\gamma \qquad \lambda e\ [\text{go-out}\ (e,x)\ \&\ \text{Cause}\ (e,z)] \\[4pt]
\ /\ \backslash \\
z \quad\ \gamma \qquad \lambda z\,\lambda e\ [\text{go-out}\ (e,x)\ \&\ \text{Cause}\ (e,z)] \\[4pt]
\qquad /\ \backslash \\
\lambda z\,\lambda e\ [\text{Cause}\ (e,z)]\quad \gamma \qquad R \qquad \lambda e\ [\text{go-out}\ (e,x)] \\[4pt]
\qquad\qquad /\ \backslash \\
\qquad\quad x \qquad [_{R}\text{yc}'] \qquad \lambda x\,\lambda e\ [\text{go-out}(e,x)]
\end{array}
$$
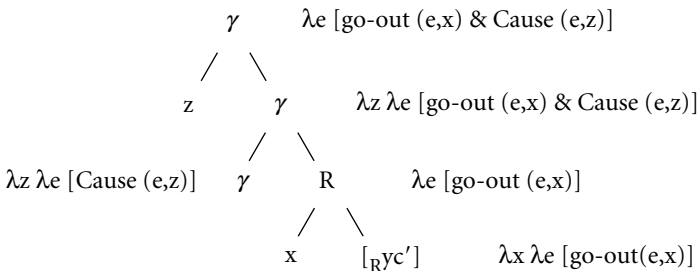
7.4 The causativization of transitive verbs

Typically, the causative agency-head γ does not embed a structure which contains both *v* and a root with an argument. Presumably, this is so since structural accusative Case can only be assigned once in Hebrew, whereas a sentence like (28) would have two arguments, x and y, which require Case, in addition to the nominative z.

(28)   *z hišbir   et y   et x
         z break-CAUS   ACC y   ACC x   'z made y break x'

But there are cases where transitive verbs can nonetheless be embedded under the causative head γ. For transitive simple verbs, there are two patterns of causativization, described by Cole (1976) and Cole and Shridhar (1977) but left unexplained since: the 'causee' (originally the subject of the simple verb) is oblique for some causative verbs derived from transitive verbs, but accusative for others.

   It turns out that causative verbs where the causee is oblique are derived from simple verbs which have locative/ experiencer subjects (e.g. *ahav* 'love', *sana* 'hate', *ra'a* 'see', *šama* 'hear', *kalal* 'include', *lavaš* 'wear', *katav* 'write', *nasa* 'take bride'). I assume that what characterizes these verbs is that the root may assign inherent Case to their locative/ experiencer argument. Inherent case does not show up with the simple verb, where this argument is assigned structural nominative Case, as in (29a), but it does show up with causative verbs (29b) and with adjectival passives (29c), where this argument is marked by the preposition *al* 'on'.

(29)   a. ha-talmid   sana   et ha-miqcoa'
            the student   hate-SIMPL   ACC the-subject
            'The student hated the subject.'
       b. ha-sefer   hisni   al ha-talmid   et ha-miqcoa'
            the subject   hate-CAUS   on the-student   ACC the subject
            'The book made the student hate the subject.'
       c. ha-miqcoa'   sanu   al ha-talmid
            the subject   hate-SIMPL-PASS-PART   on the-student
            'The subject is hateful to the student.'

   The fact that structurally, locative/experiencer subjects have a difference position than agentive/causative subjects has already been argued for by

Landau (1999; 2002), on the basis of independent sets of data. Landau (1999) investigates the distribution of Possessive Datives (first discussed by Borer and Grodzinsky (1986)). According to Landau, Possessive Datives are generated in the specifier of the possessee and raised to SPEC-VP. This position is available as a landing site for raising in structures with agentive verbs such as *qilqel* 'damage', since their own subject does not occupy SPEC-VP, but SPEC-*v*P, as shown in (30a). Landau shows that Possessive Datives never co-occur with locative/ experiencer subjects, as exemplified in (30b) and (30c).

(30) a. [[$_{\text{SPEC}}$-vP   rina] [[$_{\text{V+}v}$ qilqela] [[$_{\text{SPEC-VP}}$ le-gil$_i$]

          Rina   damaged   to-Gil

      [t$_V$ et [$_{\text{DP}}$ [SPEC-DP t$_i$]   ]   ha-ša'on]]

       ACC   the watch

    'Rina damaged Gil's watch.'

   b. gil   sana   le-rina   et   ha-tisroqet

     Gil   hated   to-Rina   ACC the hairstyle

     'Gil hated Rina's hairstyle.'

   c. *ha-xešbon   kalal   le-rina   et ha-aruxa

     the bill   included   to-Rina   ACC the meal

     'The bill included Rina's meal.'

Landau's account is that locative/experiencer subjects are mapped to SPEC-VP, unlike causative/agentive subjects, thereby filling up the Possessor Dative's landing site and blocking its extraction in (30b, c). My own account will follow Landau's in this respect. I assume that the subject argument of locative/ experiencer verbs is not an argument of *v* (but of the root).

(31)

y sana   et x

y hate-SIMPL   ACC x   'y hated x'

$$
\begin{array}{c}
R \qquad \lambda e \,[\text{hate }(e,x) \,\&\, \text{Loc }(e,y)] \\
\diagup \; \diagdown \\
y \qquad R \qquad \lambda y\, \lambda e \,[\text{hate }(e,x) \,\&\, \text{Loc }(e,y)] \\
\diagup \; \diagdown \\
x \qquad [_R \text{ sn'}] \qquad \lambda x\, \lambda y\, \lambda e \,[\text{hate }(e,x) \,\&\, \text{Loc }(e,y)]
\end{array}
$$
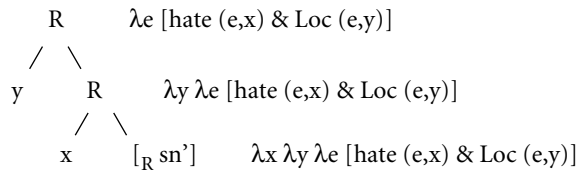
(32) y kalal   et x

    y include-SIMPL   ACC x   'y included x'

$$R \quad \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y)]$$
$$/ \ \backslash$$
$$y \quad R \quad \lambda y \, \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y)]$$
$$/ \ \backslash$$
$$x \quad [_R \ kl] \quad \lambda x \, \lambda y \, \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y)]$$
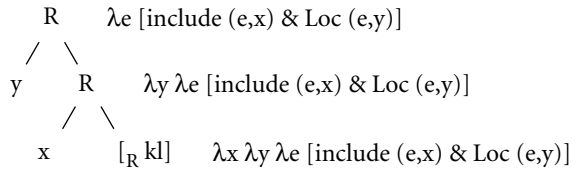
When nominative Case is assigned to a higher argument, e.g. the subject of the causative verb, then the locative/experiencer argument is assigned inherent Case by the root, *al* in example (33) and *be-*in example (34):

(33) z hisni   et x   al y

    z hate-CAUS   ACC x   on y   'z made y hate x'

$$\gamma \quad \lambda e \ [\text{hate } (e,x) \ \& \ \text{Loc } (e,y) \ \& \ \text{Cause } (e,z)]$$
$$/ \ \backslash$$
$$z \quad \gamma \quad \lambda y \, \lambda e \ [\text{hate } (e,x) \ \& \ \text{Loc } (e,y) \ \& \ \text{Cause } (e,z)]$$
$$/ \ \backslash$$
$$\lambda z \, \lambda e \ [\text{Cause } (e,z)] \quad \gamma \quad R \quad \lambda e \ [\text{hate } (e,x) \ \& \ \text{Loc } (e,y)]$$
$$/ \ \backslash$$
$$y \quad R \quad \lambda y \, \lambda e \ [\text{hate } (e,x) \ \& \ \text{Loc } (e,y)]$$
$$/ \ \backslash$$
$$x \quad [_R \ sn'] \quad \lambda x \, \lambda y \, \lambda e \ [\text{hate } (e,x) \ \& \ \text{Loc } (e,y)]$$
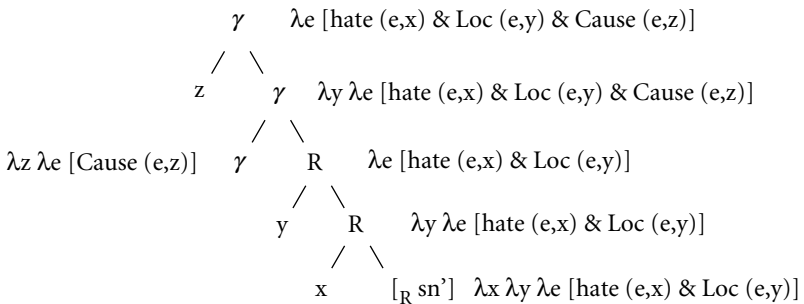
(34)   z hixlil   et x   be-y

    z include-CAUS   ACC x   in y   'z included x in y'

$$\gamma \quad \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y) \ \& \ \text{Cause } (e,z)]$$
$$/ \ \backslash$$
$$z \quad \gamma \quad \lambda y \, \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y) \ \& \ \text{Cause } (e,z)]$$
$$/ \ \backslash$$
$$\lambda y \, \lambda e \ [\text{Cause } (e,z)] \quad \gamma \quad R \quad \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y)]$$
$$/ \ \backslash$$
$$y \quad R \quad \lambda y \, \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y)]$$
$$/ \ \backslash$$
$$x \quad [_R \ kl] \quad \lambda x \, \lambda y \, \lambda e \ [\text{include } (e,x) \ \& \ \text{Loc } (e,y)]$$
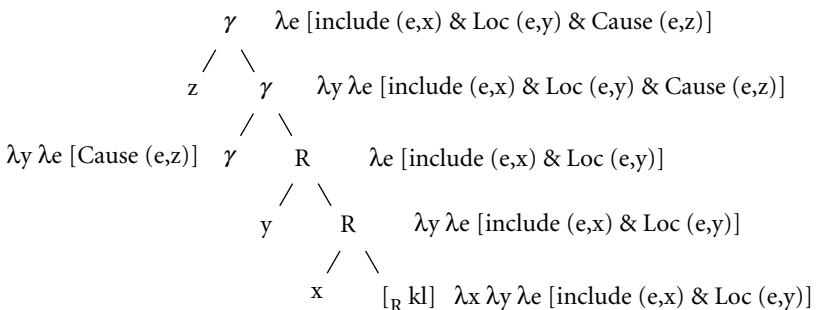
There is a second type of verb which describes emotional states, sometimes called psych-verbs (e.g. *paxad* 'fear', *da'ag* 'worry', *ka'as* 'be annoyed'), where, at least according to the analysis of Belletti and Rizzi (1988), the subject of emotion is a direct argument of the verb. This agrees with the intuition that these verbs classify the subject of emotion as affected. It also is the case that adjectival passives can be predicated of the subjects of psych-verbs (*ka'us* 'annoyed', *da'ug* 'worried'). I think it would be correct to consider the oblique argument of psych-verbs, the source of the emotion, a Cause. Indeed this oblique argument is usually marked by the preposition *me-* 'from', which is also used to express the causative relation (as is common cross-linguistically). It turns out that when the causative template embeds a psych-verb, it does not introduce a new argument. Rather, it is the source of emotion which surfaces as the subject of the causative verb. These verbs therefore require a correction to the generalization of section 7.2 whereby the causative template always adds an argument to the simple verb. In examples based on psych-verbs, γ and the preposition 'from' replace each other. 'From' is the expression of inherent Case assigned by the root to its Cause argument.

(35) a. dani   paxad   me-ha-kelev
          Dani   fear-SIMPL   from-the-dog
          'Dani feared the dog.'

      b. ha-kelev   hifxid   et Dani
          the dog   fear-CAUS   ACC Dani
          'The dog scared Dani.'

Crucially, the relevant thematic role is expressed once but not twice (similarly to Pesetky's (1995) T/SM restriction). Since γ assigns the same thematic role as the root, an additional argument of γ and the Cause argument of the root cannot co-occur in a single event.

(35) c. *ha-nevixot   hifxidu   et Dani   me-ha-kelev
          the-barking   fear-CAUS   ACC Dani   from-the-dog
          'The barking caused Dani to fear the dog.'

The same pattern is found for some location verbs. Just as the thematic role of an experiencer subject is the extension of a locative role in the locative/experiencer subject verbs, the thematic role of the subject of a psych-verb is the extension of an affected locative role. Cause arguments of roots are also found with verbs which describe such locative relations (e.g. *nadaf* 'emanate', *nazal* 'drip', *yaraš* 'inherit', *saxar* 'rent', *lava* 'borrow'):

(36) a. re'ax ra'   nadaf   me-ha-kelev
          smell bad   emanated-SIMPL   from-the-dog
          'Bad smell emanated from the dog.'

      b. ha-kelev   hidif   re'ax ra'
          the dog   emanated-CAUS   smell bad
          'The dog emanated bad smell.'

      c. *ha-haznaxa   hidifa   re'ax ra'   me-ha-kelev
          the-neglect   emanated-CAUS   smell bad   from-the-dog
          'Neglect caused bad smell to emanate from the dog.'

The fact that the subject of psych/locative verbs is a direct argument of the root is further demonstrated by the middle morphology which marks many of these verbs cross-linguistically (e.g. *nidbaq* 'be infected-MID'/ *hidbiq* 'infect-CAUS', *nidham* 'be amazed-MID/ *hidhim* 'amaze-CAUS', *nivhal* 'be frightened-MID'/ *hivhil* 'frighten-CAUS', *nignav* 'be excited-MID'/ *higniv* 'excite-CAUS', *ne'elav* 'be offended-MID'/ *he'eliv* 'offend-MID', *nig'al* 'be disgusted-MID' / *hig'il* 'disgust-CAUS'). Example structures with psych/locative verbs are shown in (37) and (38).

(37) a.
      y paxad   mi- x
      y fear-SIMPL   from x   'y feared x'

                              R λe [fear (e,y) & Cause (e,x)]
                            / \
      λe [Cause (e,x)]   mi-x   R λe [fear (e,y)]
                                        / \
                                      y   [$_R$ pxd] λy λe [fear (e,y)]

      b.
      y nadaf   mi- x
      y emanated-SIMPL   from x   'y emanated from x'

                              R λe [emanate (e,y) & Cause (e,x)]
                            / \
      λe [Cause (e,x)]   mi-x   R λe [emanate (e,y)]
                                        / \
                                      y   [$_R$ ndf] λy λe [emanate (e,y)]

(38)

a.

x hifxid   et y

x fear-CAUS   ACC y   'x frightened y'

γ   λe [fear (e,y) & Cause (e,x)]
        / \
      x   γ   λx λe [fear (e,y) & Cause (e,x)]
            / \
λx λe [Cause (e,x)]   γ   R   λe [fear (e,y)]
                    / \
                  y   [R pxd]   λx λe [fear (e,y)]

b.

x hidif   et y

x emanated-CAUS   ACC y   'x emanated y'

γ   λe [emanate (e,y) & Cause (e,x)]
        / \
      x   γ   λx λe [emanate (e,y) & Cause (e,x)]
            / \
λx λe [Cause (e,x)]   γ   R   λe [emanate (e,y)]
                    / \
                  y   [R ndf]   λx λe [emanate (e,y)]

We now turn to the second pattern of transitive verb causativization, where the causee is accusative. It turns out that these are what I will call verbs of consumption (e.g. *safag* 'absorb', *axal* 'eat', *gama'* 'drink', *yanaq* 'suck', *našam* 'breathe', *ta'an/ amas* 'carry', *xatam* 'sign/ undertake obligation', *lavaš* 'wear'). These verbs differ from the locative/experiencer subject verbs, where the locative subject is the oblique argument of the root. In consumption verbs, the subject is the *direct* argument of the root, and it is the object which is the root's oblique argument. The object is assigned structural accusative Case by a simple verb, as in (39a), but in the causative and adjectival passive constructions it is inherently case-marked by the preposition *be-*'with', as in (39b) and (39c) respectively:

(39) a. ha-ripud   safag   et ha-mayim

the upholstery   absorb-SIMPL   ACC the-water

'The upholstery absorbed the water.'

b. dani   hispig   et ha-ripud   be-mayim

Dani   absorb-CAUS   ACC the upholstery   with water

'Dani soaked the upholstery with water.'

c. ha-ripud   safug   be-mayim

the upholstery   absorb-SIMPL-PASS-PART   with water

'The upholstery is soaked with water.'

Consumption verbs are like psych/locative verbs in that the direct argument of the root surfaces as the subject. Here too adjectival passives may be predicated of the subject: *axul* 'someone who has eaten', *šatuy* 'drunk', *lavuš* 'dressed', *safug* 'soaked', *ta'un/ amus* 'loaded', *xatum* 'signatory'. There are other languages as well, such as Marathi, where the subject of consumption verbs such as 'eat' is an internal argument (see Alsina and Joshi 1991).

(40) y safag   et x

y absorb-SIMPL   ACC x   'y absorbed x'

$$
\begin{array}{l}
R \quad \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)] \\
\ \diagup\ \diagdown \\
y \qquad R \quad \lambda y\ \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)] \\
\qquad \diagup\ \diagdown \\
\qquad x \quad [_R\ \text{spg}] \quad \lambda x\ \lambda y\ \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)]
\end{array}
$$
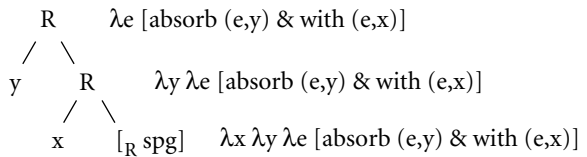
(41) z hispig   et y   be-x

z absorb-CAUS   ACC y   with x   'z drenched y with x'

$$
\begin{array}{l}
\gamma \quad \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)\ \&\ \text{Cause}(e,z)] \\
\ \diagup\ \diagdown \\
z \qquad \gamma \quad \lambda z\ \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)\ \&\ \text{Cause}(e,z)] \\
\qquad \diagup\ \diagdown \\
\lambda z\ \lambda e\ [\text{Cause}(e,z)] \quad \gamma \quad R \quad \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)] \\
\qquad\qquad \diagup\ \diagdown \\
\qquad\qquad y \quad R \quad \lambda z\ \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)] \\
\qquad\qquad \diagup\ \diagdown \\
\qquad\qquad x \quad [_R\ \text{spg}] \quad \lambda x\ \lambda y\ \lambda e\ [\text{absorb}(e,y)\ \&\ \text{with}(e,x)]
\end{array}
$$
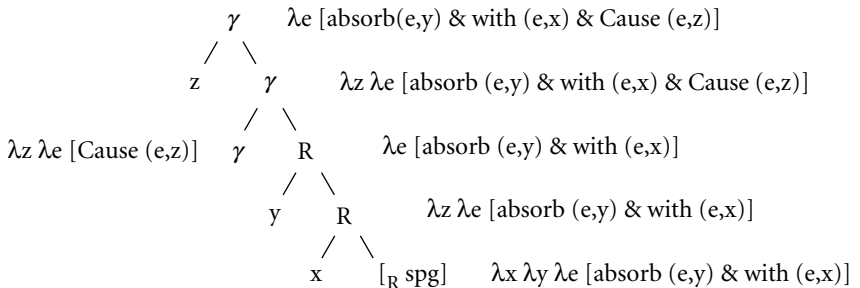
In sum, the present system accounts for the two patterns of causativization of Hebrew transitive verbs described by Cole (1976), according to whether it is the subject or the object of the simple verb which is obliquely case-marked.

7.5 Conclusion

This chapter has provided evidence for the realization of the aspectual dimension of agency by functional heads which syntactically merge with roots. One such functional head which has already been argued for in the literature is the light verb *v*, which introduces the Agent. The present work has provided evidence, based on the morphology of Semitic verbs, for two agency-heads which determine whether the thematic role of the external argument of the verb is Actor or Cause. Neither Actor nor Cause is a role assigned by the root or the light verb *v*. Morphologically, these two agency-heads mark the verb with intensive or causative morphology. The intensive agency-head is a modifier of the root. The argument of the root that it modifies is not a participant in the event, but the event itself, which it classifies as an Action. The causative agency-head merges with a fully constructed verb. Semantically, it is not a modifier, but introduces its own argument.

The agency dimension adds the marked thematic relations of Actor and Cause to the unmarked thematic relation of Agent, and creates a thematic classification of verbs. As is well known, the temporal aspectual classification is based on the concepts of change and culmination. This chapter has shown that the agency aspectual classification, on the other hand, is based on the concepts of action and causality.

8

Agents and Causes in Malagasy and Tagalog

LISA TRAVIS

8.1 Introduction

In the discussion of theta-roles and the linking of arguments to phrase structure, the question has arisen as to whether all 'external' arguments are treated the same by the syntax. The more specific question that I want to explore is whether Agents and Causes are realized the same way in phrase structure. Using a particular case of morpheme deletion in Tagalog as a probe, I will be claiming that Causes are realized in a position that is asymmetrically c-commanded by the Agent position.[1] Since this conclusion is based on a certain view of the structure and analysis of Tagalog and Malagasy, I will begin by summarizing the details necessary for the remainder of the arguments. The main line of argument is that Tagalog has a morpheme *pag-* (realized as the head *v*) that introduces Agents (see section 8.2.1), and that this morpheme deletes when its Specifier position is overt at Spell-out (see section 8.2.2). Tagalog also has a morpheme complex realized as *maka-* that introduces Causes (non-volitional external arguments) (see section 8.3.1). I argue that

[1] See Fujita (1996) for a similar proposal, as well as Pylkkänen (1999) for a proposal that there are two different heads for Cause and external argument. Within this volume, there are also proposals concerning the distinction between Cause and Agent. See e.g. Butt and Ramchand (this volume) and Doron (this volume). It would be interesting to compare, for example, the *man/maha* and *pag/maka* distinction in Malagasy and Tagalog respectively with the use of light verbs in Urdu and the intensive/causative distinction in Hebrew. Another similar distinction is found in the 'out of control' construction in Salish, discussed in Davis and Demirdache (2000).

the *ka-* of this complex is in Asp(ect) which is realized below *v*P and encodes telicity (see section 8.3.2). Further I argue that it is this *ka-* that introduces the Cause theta-role (see section 8.3.3). Since *ka-* deletes when the Cause remains in its base position at Spell-out, we have confirmation that the Cause is realized in the Spec, Asp position, a position lower than Spec, *v*P (see section 8.3.4). In the conclusion (section 8.4), I suggest that the results of this research can be used to explain an odd morphological pattern in cognition verbs in Tagalog as well as an unexpected generalization in nominal formation in Malagasy.

8.2 v and v Deletion in Tagalog

I will be claiming that we can determine the base position of Agents and of Causes by looking at a morpheme-deletion phenomenon in Tagalog. Since I will also be using data from Malagasy to investigate the use of some particular morphemes, I introduce Malagasy and Tagalog morphology in a parallel fashion. To set up the argument, I begin by reviewing the morpheme that introduces Agents in Tagalog and in Malagasy.

8.2.1 *Lexical and productive causatives*

Both Malagasy and Tagalog have productive intransitive/lexical causative alternations. Some examples of the alternation are given for each language below. I assume from these data that the lexical causative morpheme is *pag-* in Tagalog and *an-* in Malagasy.[2]

(1)   Tagalog

t-um-**umba**	X fall down	m-<u>pag</u>-**tumba**	Y knock X down
s-um-**abog**	X explode	m-<u>pag</u>-**sabog**	Y scatter X
um-**akyat**	X climb	m-<u>pag</u>-**akyat**	Y bring up X

(2)   Malagasy[3]

m-i-**hisatra**	X move slowly	m-<u>an</u>-**isatra**	Y move X slowly
m-i-**lahatra**	X be in order	m-<u>an</u>-**lahatra**	Y arrange X
m-i-**sitrika**	X hide	m-<u>an</u>-**itrika**	Y hide X

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[2] Many working on Tagalog syntax or morphology believe that *pag-* is part of the Topic Marking in this language (see e.g. Carrier Duncan 1985), indicating that the topic is an Agent (parallel to the *-um-* infix of the intransitive). I have argued elsewhere, following Maclachlan (1989), that the *m-* prefix on the lexical causative is parallel to *-um-* and that the *pag-* is a causative morpheme (see Travis 2000). One reason is that this morpheme is used not only for lexical causatives but also for productive causatives, as we will see shortly.

[3] The *i-* morpheme in the intransitive will not enter into our discussion here, though its place in the verbal paradigm will be mentioned in section 8.3.1.

One reason that this morphological analysis is appealing is because both languages use these lexical causative morphemes for productive causatives. I begin by discussing productive causatives in Malagasy because the iteration of the causative morpheme is more transparent.

In Malagasy, the productive causative is formed by adding *m-amp* to the stem. This is shown below for the intransitive and the lexical causative forms of the root *hisatra* 'to move slowly'. Following Hung (1988), I assume that *m-amp-* is in fact formed from three morphemes, *m*, *an-*, and *f-*.

(3)   *Stem*   *Productive causative*

    a. mihisatra   mampihisatra   *Intransitive stem*

     m-i-hisatra   m-**an-f**-i-hisatra

     X move slowly   *Z make X move slowly*

    b. manisatra   mampanisatra   *Lexical causative stem*

     m-an-hisatra   m-**an-f**-**an**-isatra

     Y move X slowly   Z make Y move X slowly

As we can see in (3b) above, setting aside the question of the *f*-morpheme, the productive causative of the lexical causative stem contains two causative morphemes *an-*, one encoding the lexical causative, the other encoding the productive causative.[4]

8.2.2 *Morpheme deletion*

Tagalog, I argue, has the same underlying pattern, but this pattern is obscured by morpheme deletion.[5] We start by looking at the productive causative in Tagalog, again comparing the productive causative of the intransitive and the productive causative of the lexical causative. The relevant data for the root *akyat* 'climb/bring up' are given below in (4) (from Ramos and Bautista 1986: 5).

(4)   *Stem*   *Productive causative*

    a. umakyát   magpaakyát   *Intransitive stem*

     um-akyat   m-**pag**-pa-akyat

     X climb   *Z make X climb*

    b. mag'akyát   magpaakyát   *Lexical causative stem*

     m-pag-akyat   m-**pag**-pa-**??**-akyat

     Y bring up X   Z make Y bring up X

[4] In Travis (2000), I discuss these two causatives to highlight a distinction between two syntactic modules—l-syntax causatives and s-syntax. Butt and Ramchand (this volume) also discuss this issue, referring to l-syntax as first-phase syntax.

[5] This is not morpheme deletion so much as realization of a zero morpheme.

We note first that where Malagasy has *f-* between the two causative morphemes, Tagalog has *pa-*. I do not discuss this morpheme further here (see Travis (1994) for an analysis). What is surprising here is that the two productive causative forms are identical—both *magpaakyat*. The form we get for the productive causative of the intransitive stem in (4a) is as expected, but the form for the lexical causative stem appears to be missing a morpheme (see (4b)). Instead of adding the productive causative morphology to the full lexical causative stem, we seem to be adding it to the intransitive stem in both cases. In other words, the lexical causative *pag-* disappears when the productive causative *pag-* is added.

It may seem that there is a surface filter on morpheme doubling, but other forms in the paradigm show that this is not the case. Western Malayo-Polynesian languages are famous for intricate voice systems. Verbal morphology changes depending on what element is in the subject position.[6] The forms that we have been looking at are the A2 Topic forms, i.e. those verbal forms that are used when the causer[7] is in the subject position. Below, I compare the A2 Topic forms of the productive causative of the lexical causative with the A1 Topic form and the Object Topic form (from Ramos and Bautista 1986).[8]

(5)   a.   magpaakyat   m-pag-pa-~~pag~~-akyat   A2 Topic (causer subject)
      b.   papagakyat-in   ~~m-pag~~-pa-pag-akyat-in   A1 Topic (causee subject)
      c.   ipaakyat   ~~i-m-pag~~-pa-~~pag~~-akyat   Object Topic (embedded
                                                       Theme subject)

I have presented the morpheme analysis as if every form underlyingly contains all the relevant morphemes and the surface realizations are created by deletion of certain morphemes. In terms of the syntax, I will assume that certain heads are able to surface with zero realization under certain conditions. I leave aside here what accounts for the realization of *m-*, and concentrate on *pag-* deletion. Looking at the paradigm in (5), we can see that the lower *pag-* deletes when the higher Agent becomes the subject (5a). The higher *pag-* deletes when the lower Agent becomes the subject (5b). And both *pag-*s delete when the lower object

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[6] I do not intend to enter the debate here about what the subject is in Tagalog (see e.g. Schachter 1976; 1996; Kroeger 1993; Maclachlan 1996; Richards 2000; Aldridge 2003), and I believe it is tangential to the issues that I will be discussing. I will, however, be suggesting in my terminology that the subject is the *ang*-marked NP sometimes called Topic (e.g. Carrier-Duncan 1985; Richards 2000; Schachter and Otanes 1972).

[7] Causer (introduced by productive causative morphology) should not be confused with the Cause argument, which we will see later.

[8] I make no claims about the morphemes *i-* and *-in* here.

becomes the subject (5c). A better way of looking at it is that the *pag-* remains only when the Agent that it introduces has moved to the subject position (5a). When the higher Agent moves to the subject position, the higher *pag-* is realized (5b). When the lower Agent moves to the subject position, the lower *pag-* is realized. When neither moves (rather, it is the lower Theme that becomes the subject), neither *pag-* can be realized (5c).[9] The generalization is that when the Spec position of a *pag-* head is filled, then that *pag-*has a zero realization. In terms of the tree below, when Agent2 remains in place, *pag2-* has a zero realization. When Agent1 remains in place, *pag1-* has a zero realization. And when both Agents remain in situ, both *pag-* s have zero realization.[10]

(6)
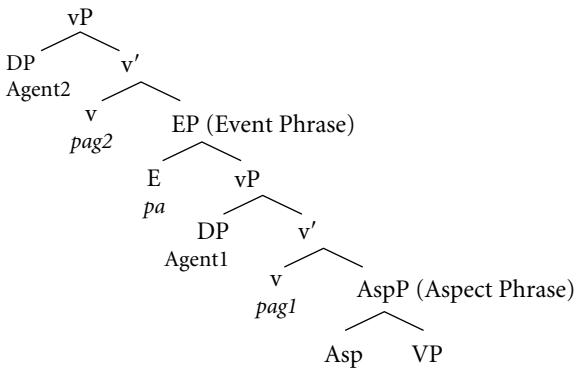
I will assume that this prohibition against the Spec and the Head of the *pag-* projection being filled at the same time is like the Doubly Filled Comp filter and subsumed under a filter of the same type as the Doubly Filled Voice Filter proposed by Sportiche (1996) and given below in (7).[11]

(7)   Doubly Filled Voice Filter (Sportiche 1996)[12]

   *[HP XP [H ...]]

   where H is a functional head licensing some property P

   and both XP and H overtly encode P.

[9] Thanks to Kie Ross Zuraw, who first described the *pag-* facts to me this way. Though I do not take the details of her morphological analysis (Ross 1993), it is her generalization that led me to the syntactic analysis presented here.

[10] This tree reflects the structure that I have argued for elsewhere. Event Phrase will not be important to us beyond being a position in which to place *pa-* in Tagalog and *f-* in Malagasy. Aspect will become very important shortly. This type of articulated VP also appears in other chapters in this volume such as Butt and Ramchand and Erteschik-Shir and Rapoport.

[11] Thanks to Mark Baker for pointing me to this work.

[12] Unlike Chomsky (1995), I do not assume that causative little *v* is a functional category. However, I do believe that the Doubly Filled Voice Filter, or something like it, can be used to account for the zero realization of *pag-*. Therefore, I am going beyond the letter of the filter in (7) while staying within the spirit.

Having looked at the morpheme that introduces Agents in Tagalog and Malagasy, and the structural conditions that allow the zero realization of this morpheme in Tagalog, I now turn to the morphology that is used to introduce Causes and non-volitional Agents in both languages.

8.3 Causes and non-volitional Agents

Both Tagalog and Malagasy have a different set of morphemes to introduce Causes and non-volitional Agents. In Tagalog *maka-* is added to the root, and in Malagasy it is the cognate *maha-*. Some examples are given below for Malagasy since, as we will see shortly, morpheme deletion once again interacts with the realization of the prefixes in Tagalog.[13]

(8)   Malagasy (from Abinal and Malzac 1988)

sosotra	X be annoyed	m-<u>aha</u>-**sosotra**	Y annoy X
tezitra	X be angry	m-<u>aha</u>-**tezitra**	Y anger X
finaritra	X be happy	m-<u>aha</u>-**finaritra**	Y please X
menatra	X be ashamed	m-<u>aha</u>-**menatra**	Y shame X

I begin the discussion by showing (following Phillips 1996; 2000) that *aha-* and *aka-* are, in fact a sequence of two morphemes. Then I will argue that *a-* in both languages is in the top V (little v) and that the *ka-/ha-* morpheme is in Aspect.[14]

8.3.1 *Morpheme make-up of maha-* and *maka-*

Both Tagalog and Malagasy use *(m)a-* attached to roots to form stative predicates.

(9)   Malagasy (from Abinal and Malzac 1988)

dio	cleanliness	m-a-**dio**	clean
loto	dirtiness	m-a-**loto**	dirty
zava	light, clarity	m-a-**zava**	clear
zoto	diligence	m-a-**zoto**	diligent

---

[13] Not surprisingly, as this construction has a cause or non-volitional Agent as its external argument, it is often used to form Object Experiencer psych predicates, but we will see other uses of this morphology below.

[14] Much of the next section owes much to Phillips's work, and the reader is referred to her two works on this topic (1996; 2000) for more detail.

(10)   Tagalog (from Ramos and Bautista 1986)

bigo′   disappointed   m-a-**bigo′**   be disappointed

gulat   shock   m-a-**gulat**   be surprised

Phillips (1996; 2000) argues that uses of *maha-* are also all stative, contributing to the non-volitional interpretation of the external arguments.

Further, by viewing *ma-* of *maha-* as the stative morpheme, we can fill in a paradigm in Malagasy where this *ma-* prefix is one of three prefixes that can be added to a root turning the root into a verb form. The other two prefixes we saw in (2) in the discussion of transitivity alternations in Malagasy—*mi-* for intransitives and *man-* for transitives. In fact, all three of these verbal prefixes can be attached to a stem containing the root and the prefix *ha-* (which becomes *ka-* following a nasal). We have already seen the cases of *m-a-ha-√* in (8) above, but examples of *m-an-ha* and *m-i-ha* are given in (11) and (12) below.

(11)   *manka*   'Y make X A'   (m-an-ha-√)

hery   strong$_A$ manka**hery**   Y make X strong

mamy   sweet$_A$ manka**mamy**   Y make X sweet

rary   pain$_N$ manka**rary**   Y make X sick

(12)   *miha*   'X become A'   (m-i-ha-√)

tsara   good   miha**tsara**   X get better

ratsy   bad   miha**ratsy**   X get worse

The last argument that the *aka-/aha-* causative prefix is best viewed as a sequence of two prefixes comes from morpheme-deletion facts like those we have seen previously. We can see in the Tagalog data given below that the root *takot* 'fear' can take either *ma-* or *ka-* prefix depending on what argument is in the subject position (from De Guzman 1992).

(13)   m-a̲-**takot**   Experiencer Subject   m-a-k̲a̲-takot

k̲a̲-**takut**-an   Object Subject   ~~m-a~~-ka-takot-an

As above, I assume that both the *a-* and the *ka-* morphemes are present in both forms, but one simply has the zero realization. This account only makes sense, however, if these are, in fact two separate morphemes.

If it is true that *maha-/maka-* is a sequence of morphemes, and the morpheme *a-* creates a stative verb, the questions are: what does the *ha-/ka-* do, what introduces the Cause argument, and how do we account for this instantiation of morpheme deletion?

8.3.2 *ha-/ka- as telicity marker*

In this section I show that *ha-*in Malagasy marks telicity.[15] First we have to note that Malagasy is in general an 'atelic' language, in that the unmarked way of describing an event implicates but does not entail the end-point. This is shown in the following examples for a transitive active construction, a passive construction, and an intransitive (unaccusative) construction.[16]

(14) a. na<u>m</u>ory   ny ankizy   ny mpampianatra   TRANSITIVE ACTIVE
        PST.*AN*.meet the children the teachers
        'The teachers gathered the children'

    b. … nefa   tsy   nanana   fotoana   izy
            but   NEG PST.have time   they
        '… but they didn't have time.'

(15) a. Novorin'ny   mpampianatra   ny ankizy   PASSIVE
        PST.meet.PASS.GEN' the teachers   the children
        'The children were gathered by the teachers.

    b. … nefa   tsy   nanana   fotoana izy

(16) a. N<u>i</u>vory   ny ankizy   INTRANSITIVE (UNACCUSATIVE)
        PST.*I*.meet the children
        'The children met.'

    b. ? …nefa   tsy   nanana   fotoana   izy

There is, however, a way to insist on the end-point of the event having been achieved with each of these constructions. With the active transitive we use the now familiar (set of) prefix(es) *maha-*.[17] This has the double effect of insisting on the end-point of the event and making the Agent non-volitional. As we can see below, once this construction is used, the end-point is no longer defeasible.[18]

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[15] While I restrict my discussion here to Malagasy, many of the same observations can be made for Tagalog as outlined by Dell (1983). What is different in Malagasy, as far as I understand it, is that Malagasy has a different set of telic morphemes for passives and unaccusatives.

[16] My consultant found it difficult to undo the implicature for the intransitive construction in (16), but there was a strong contrast between being difficult in this case and impossible in the case we will see in (19) below, where the telic morpheme has been added.

[17] *m-* becomes *n-* in the past.

[18] As is often the case, getting the exact translation is difficult. Many times these telic constructions are translated as abilitative (the teacher was able to gather the children). The important things are that the end-point is achieved and the AGENT is non-volitional (see Dell 1983). A reviewer points out that it is not clear that this is a matter of telicity rather than perfectivity. To show this, I turn to two

(17) a. <u>naha</u>vory   ny ankizy ny mpampianatra
          PST.*A.HA*.meet the children the   teachers
          'The teachers gathered the children.'
      b. *...nefa tsy nanana fotoana izy

The passive and the intransitive also have telic counterparts. The passive form adds *voa-* to the root and the intransitive form adds *tafa-* to the root.

(18) a. <u>voa</u>vorin'ny mpampianatra ny ankizy
          VOA.meet.gen'the teachers   the children
          'The children were gathered by the teachers.'
      b. *...nefa tsy nanana fotoana izy
(19) a. <u>tafa</u>vory   ny olona
          TAFA.meet the people
          'The people met.'
      b. *... nefa tsy nanana fotoana izy

8.3.3 *Telicity and an extra argument*

There is a surprising effect, however, when telicity is added to the intransitive (unaccusative). Let us first compare the telic passive construction and the telic unaccusative construction above. Here we see the classic difference between the passive and the unaccusative. While the passive has an Agent realized, the unaccusative does not. Further, when the Agent is not realized in the passive, it is still implicit. In the intransitive construction, however, there is no Agent implied. This is not surprising, as it behaves as in English. What is surprising is that an external Cause of this unaccusative predicate can be made overt within the VP, as the following example shows.

(20) Tafavorin'ny   mpampianatra   ny ankizy
      TAFA.meet.gen'the   teachers   the children
      'The teachers were able to gather the children.'

Here we see the same type of non-volitional Agent as appears in the subject position in the active transitive construction (see (17)) and within the VP in

arguments presented in Butt and Ramchand (this volume). First, the *maka-* constructions in Tagalog appear with the full range of aspectual distinctions. Secondly, these morphemes are used to manipulate the Aktionsart of the constructions, (typically changing an activity such as *mijery* 'look for' into an achievement *mahajery* 'find' (see Travis (1996; forthcoming) for a discussion of this).

the passive (see (18)). The atelic form of the unaccusative is not able to have this extra argument expressed as the two attempts below show (in one case the attempted extra argument is placed in the subject position, in the other case it is placed within the VP).

(21)   a. *Nivory   ny ankizy   ny mpampianatra   (cf. (16)).
           PST.*I*.meet the children the teachers

       b. *Nivorin'ny mpampianatra ny ankizy

I will assume that it is the telicity itself that allows this extra argument to be realized.[19] It cannot, however, be that telicity always adds an argument to the theta-grid, since the argument structure of the transitive active and the argument structure of the passive show no change in the number of arguments that they have. They do show a subtle change, however. In both cases, the Agent is now a non-volitional Agent. In order to collapse all three cases, I assume that telicity will take an Agent and turn it into a Cause (non-volitional Agent) when attached to roots that have Agents in their theta-grids. When attached to a root with no external argument (such as an unaccusative or an adjective), it will add a Cause argument.[20]

We have seen how the telic morpheme creates a Cause out of an Agent in example (17) with the active transitive, and in example (18) with the passive. Example (19) shows how the Cause argument has been added to the argument structure of an unaccusative. Example (22) below shows a case where *maha-* attached to an adjective adds a Cause argument.

(22)   a. Tsara   ny trano
          beautiful   the house
          'The house is beautiful.'

       b. Mahatsara   ny trano   ny voninkazo
          PRES.*A.HA*.beautiful the house   the flowers
          'The flowers make the house beautiful.'

Crucially for my claims, while the subject of a *maha-* Adj construction may be animate, it cannot be a volitional Agent (see Phillips 2000: 90). In the example below, for the sentence to be acceptable, Rabe can only beautify the room by his presence, not by doing something like painting it.

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[19] See Chen (1995) for a similar conclusion concerning flip constructions in Chinese.

[20] This argument will be obligatory when it is designated as the subject as with *maha-*. It will be optional if it remains within the VP as with *voa-*.

(23)   Mahatsara   ny   trano   Rabe
        PRES.*A*.*HA*.tsara   the   house   Rabe
        'Rabe makes the house beautiful.'

Given that telicity is what is relevant for both the change of the status of the Agent and the addition of the Cause argument, I tentatively place the external argument in the Spec, Asp, but will confirm its placement in this position in the following section. The *maha-* structures that I will be working with are given in (24) below. Note again that there are two types of argument within the Spec, Asp. One is the pure causative (24a), where the external argument does not appear in the theta-grid of the root but is supplied by the telic Asp. The other (24b) is the argument that appears in the theta-grid as Agent but which is realized as a Cause (non-volitional Agent) in the Spec, Asp.

(24)   a. *maha-* causative

          [VP1 [V1′ **a-**   [AspP X [Asp′ **ha** [VP2 Y [V′ √]]]]]]
                           'Cause'   [+telic]   (Th)

          b. *maha-* non-volitional Agent

          [VP1 [V1′ **a-** [AspP X [Asp′ **ha** [VP2 Y [V′ √]]]]]]
                           'AGENT'   [+telic]   (Agt, Th,...)

So far my reasons for placing the Cause in a lower position than Agent has been due to its dependency on telicity in Malagasy and Tagalog. In the next section I will argue that morpheme deletion in Tagalog provides further support for this claim.

8.3.4 *Morpheme deletion with Causes*

We return to Tagalog morpheme deletion to use this as a probe in determining the base position of the external Cause (non-volitional Agent) position. Previously in looking at morpheme deletion, we had *pag-* in *v* deleting. In the *maka-* causative construction, we would expect *ma-* to delete if deletion always targets *v*, or if the non-volitional Agent has its base position in Spec, vP. However, as the data below show, when we get a non-volitional Agent that

remains in its base position, it is the *ka-* that deletes, not the *ma-*. In (25a) the non-volitional Agent has moved to the subject position and we have the full form of *maka-*. In (25b), however, it is the Theme that has moved to the subject position, the non-volitional Agent remains in situ, and *ka-* is realized as a zero morpheme (from Schachter and Otanes (1972: 330)).[21]

(25) a. Nakagamit   siya   ng   manggang hilaw
          PST.*A.KA.* use   he.nom   acc   mango.lnk   green
          'He was able/happened to use a green mango.'

      b. Nagamit   niya   ang   manggang   hilaw
          PST. *A.* use   he. gen   nom   mango.lnk   green
          'He was able/happened to use a green mango.'

I take this *ka-* deletion as confirmation for the preliminary hypothesis that Causes and non-volitional Agents are generated in a syntactic position that is lower in the tree than the pure Agent position. This conclusion raises many questions—some of which will be explored in the remainder of this chapter.

8.4 Consequences and extensions

One consequence of the analysis outlined above is that, if we take this morpheme deletion very seriously, we are forced to reanalyse the argument structure of some verbs such as experiencer verbs. De Guzman (1992) describes the puzzle shown in (26).[22] When looking at the paradigms of the verbs below, we get some irregularity—there appears to be a mismatch of syntax and morphology. Looking only at the highlighted areas, we can see that *ma-*√ is used for constructions where the object is the subject for perception and cognition verbs but for constructions where experiencer is the subject for emotion verbs.[23]

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[21] Tagalog is a fairly free word order language, so linear order does not necessarily indicate phrase structure position.

[22] De Guzman's interest is in first-language acquisition, not in the determination of argument structure.

[23] I save the questions raised by the rest of this paradigm for future work.

(26)

Root		Experiencer Focus (EF)	Object Focus (OF)	Reason/Other Focus (RF)
Perception				
kita	see	*MA-KA+kita*	*MA-kita*	*I-KA-kita (MA-kita-AN)*
dinig	hear	*MA-KA+dinig*	*MA-dinig*	*I-KA-dinig (MA-dinig-AN)*
punah	notice	*MA-KA+punah*	*MA-punah*	*KA-punah-AN*
damdam	sense	*MA-KA+damdam*	*MA-damdam*	*I-KA-damdam*
Cognition				
alala	remember	*MA-KA+alala*	*MA-alala*	*(I-KA-alala)*
alam	know	*MA-KA+alam*	*MA-(a)lam-AN*	*(I-KA-alam)*
isip	think	*MA-KA+isip*	*MA-isip-(AN)*	*(I-KA-isip)*
tutoh	learn	*MA-tutoh*	*MA-tutoh-AN*	*KA-tutoh*
Emotion				
takot	fear	*MA-takot*	*KA-takot-AN*	*(I-KA-takot)*
inis	annoyed	*MA-inis*	*KA-inis-AN*	*(I-KA-inis)*

Given my assumptions, the *ma-√* form is really the *ma-ka-√* form with the *ka-* in its zero realization. Further, the zero form comes about because Cause is in situ. This forces us to reanalyse the object of an emotion verb as the Cause, and the experiencer of a perception or cognition verb as a Cause. Below I give De Guzman's argument structure contrasted with what the present analysis forces us to say.

(27) a. Emotion verbs: X   fears   Y

         De Guzman   Exp   Obj

         Proposed   Obj   Cause

         Y = Cause of X's being frightened

   b. Cognition/perception verbs: X   knows   Y

         De Guzman   Exp   Obj

         Proposed   Cause   Obj

         X = Cause of Y's being known

Once the argument structure is viewed this way, the paradigm becomes less problematic, and perhaps we have learned something about how these languages choose to organize the argument structure of such verbs.[24] It is clear

[24] Phillips includes a discussion of transitive achievement verbs in her thesis, which, while possibly relevant here, would take us beyond the page limits of this chapter.

from the examples below that in Malagasy the Cause and Experiencer line is quite blurred.

One can ask how the proposal presented here differs from other proposals that locate Causes in a lower syntactic position than Agents such as that in Fujita (1996). One difference concerns the way that this Cause theta-role is assigned. First, it seems to be assigned by a non-lexical category, Aspect. Second, there are two manifestations of it. In one case, the theta-role comes partly from the theta-grid of the root (24b). In the other case, the theta-role comes purely from the +telic Aspect (24a). I think both these complications of the theory are required. In other words, I think that this theta-role has to be seen as different from other theta-roles. My main reason to believe this comes from *f-* nominalizations in Malagasy. As we can see in the data presented below, *maha-* predicates can be made into *f-* nominals[25]; however, whether or not the external argument is encoded in the theta-grid of the root or not determines the meaning of the nominal.

(28)   a. √**soritra**   'line'

      b. m-an-√soritra   manoritra   'to sketch'

      c. m-a-ha-√soritra   mahasoritra   'to be able to sketch'

      d. f-a-ha-√soritra-a-na   ny fahasoritana   'the capability of sketching'

(29)   a. √**kamo**   'lazy'

      b. m-an-√kamo   *mankamo,   'to enlazy?'

                             *manakamo

      c. m-a-ha-√kamo   mahakamo   'to make lazy'

      d. f-a-ha-√kamo-a-na   ny fahakamoana 'laziness'

Those roots with full theta-grids (i.e. having external argument) can combine with the prefix *an-*, as shown in (28b). Adjectival roots have no external argument in their theta-grid and cannot combine with *an-*, as shown in (29b). The claim, then, would be that only roots that contain an Agent in their theta-grid can combine with *an-*. The distinction just seen correlates with another distinction within the paradigm. Only the roots that can combine with *an-* retain the meaning of verbal *maha-* form when in the *f-*nominal (compare (28c, d) with (29c, d)). Another way to look at this, then, is to say that when there is no external argument in the theta-grid of the root, the *f-*nominal has the meaning of an abstract noun (this is quite productive where other examples are √*finaritra* 'happy'—*fahafinaretana* 'pleasure'; √*menatra* 'ashamed'—*fahamenarana* 'shame'). The loss of the verbal meaning may be

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[25] Paul (1997) discusses the formation of *f-* nominals in detail.

due to the inability of Aspect to be active in a nominal vs. verbal expresssion. Apparently, the theta-roles that are completely dependent on the Aspect head are lost. Obviously, more work needs to be done here, but the preliminary findings suggest that the theta-role assigned solely by the [+telic] feature in Aspect is different from others. This would not be surprising, since the head responsible for the theta-role is different.

There are a variety of directions into which this research can extend. One interesting outcome is that we can now test whether external arguments act like Agents or Causes. Here I will just give some examples that raise questions, leaving a proper investigation to further research. As shown below, the 'Agent' morphology can be used for instruments (from Paul 2000: 53).

(30) Mandidy   tsara ny   hena   ity   antsy ity
      PRES.*AN*. cut   well   the   meat   this   knife   this
      'This knife cuts the meat well.'

Further, while generally the Cause morphology is used for Object Experiencer psych predicates, the 'Agent' morphology can be used as well. Only when the 'Agent' morphology is used, however, is the third argument (see Pesetsky 1995) possible.

(31) Naha<u>l</u>ina   an-dRakoto (*an' iMadagasikara)   ny mpampianatra
      PST.*AHA*. √interest acc-Rakoto (in Madagascar)   the   teacher
      'The teacher interests Rakoto (*in Madagascar).'

(32) Nampalina   an-dRakoto (an'iMadagasikara)   ny mpampianatra
      PST.*AN-FA*-√interest acc-Rakoto (in Madagascar)   the   teacher
      'The teacher made Rakoto interested (in Madagascar).'

(33) Naha<u>l</u>ina   ahy   (* an'iMadagasikara) ny   lahatsoratra
      PST. *AHA*.√interest acc.1sg (in Madagascar)   the   article
      'The article interested me (*in Madagascar).'

(34) Nampalina   ahy   (an' iMadagasikara)   ny   lahatsoratra
      PST.*AN-FA*.√interest acc.1sg (in Madagascar)   the   article
      'The article made me interested in Madagascar.'

A clear difference between the Causes investigated in the rest of the chapter and the non-agentive external arguments of (30) and (32) has more to do with event structure than argument structure. There is a distinction between a stative Cause and an eventive Cause. Continuing research would have to take these interacting differences seriously, but I leave this for another paper.

8.5 Conclusions

This chapter has explored the mapping of argument structure to phrase structure by investigating two types of causative morpheme in Malagasy and Tagalog as well as morpheme deletion in Tagalog. The conclusion is that Causes are introduced lower in the phrase structure than Agents. A consequence of the investigation is that languages appear to create different argument structures for similar predicates. Where English might represent the verb *know* as 'X experiences the knowledge of Y', other languages such as Tagalog and Malagasy present the verb 'know' as 'X is the cause of Y being known'. Further, it has been proposed that cause may overlap with an external theta-role already present in the theta-grid of a predicate, or it may be added to the theta-grid of a predicate that contains no external theta-role, with consequences for further manipulation of the predicate. If this chapter is on the right track, languages such as Tagalog and Malagasy, where these subtle theta-role distinctions are quite clearly marked, can act as a laboratory for further related investigations.

9

Event Structure and Morphosyntax in Navajo

CARLOTA S. SMITH

Event structure in Navajo presents a challenge to generative linguistic analysis. The Navajo verb word has a complex structure with an abstract stem and prefixes that appear in fixed positions. The positions are traditionally represented by a template. The goal of this chapter is to determine how information about event structure is conveyed in the Navajo verb, and to consider how best to represent such structure in a linguistic account. I discuss two different approaches: semantically based syntax and the surface-structure interpretation of Discourse Representation Theory. I argue that the latter is preferable on grounds of simplicity and adequacy.

Section 9.1 gives some basic facts about Navajo; section 9.2 sets out a general scheme for representing the information in the Navajo verb word, information that is relevant to any theory. Section 9.3 discusses the details of event structure in Navajo; and section 9.4 presents two approaches to the facts adduced: semantically-based syntax and Discourse Representation Theory. Section 9.5 concludes.

9.1 Preliminaries

9.1.1 *The Navajo verb word*

The Navajo verb word contains the grammatical information essential to a clause, and can function as one on its own. The verb word is a unit with a series of prefixes and an abstract verb stem as the basis of the whole. Following Young and Morgan (1987), I distinguish three levels of the verb word. The first is the verb theme, which contains the verb root/stem, classifier, and certain tightly bound thematic elements. Next is the verb base: at this level the verb

root is realized as one of a set of possible stems.[1] The base consists of the verb theme with prefixes conveying lexical, adverbial, and thematic concepts, including plurality.

The verb base is the unit closest to the verb in languages like English, although it carries more information than the verb *simpliciter*. The third level of the verb word includes pronominal and conjugational prefixes, which are hierarchically outside the verb base. The pronominal prefixes denote the subject and object arguments of the verb base. The conjugational prefixes, known as 'Modes', give several kinds of information; there are some dependencies with other morphemes.[2] The verb structure is shown in (1).

(1)　Verb Theme:　Theme[classifier [root]]

　　　Verb Base:　Base[prefixes ₜₕₑₘₑ[classifier+root/stem]]

　　　Verb Word:　Vword [pronom & conjug prefixes [Base]]

The linear order of the prefixes does not correspond to their hierarchical order. I will assume that the verb word is derived by placing affixes in the verb word according to their hierarchical order (Speas 1990: 228). I will return to the topic of how the verb word is generated in section 9.4.

The form in (2) gives an example of a verb word, analysed into its parts by the scheme above. The leftmost, outer prefixes are derivational, noted 'pref'. The inner prefixes are conjugational ('cjg') and pronominal, with a subject prefix ('subj'); and a classifier ('cl'). The raised comma indicates glottal stop ('), the acute accent indicates high tone (á), and the hook indicates nasalization (ą).

(2)　na'ashkǫ́ǫ́' (I swimming around)

　　　na -'a -ø -sh -ł -kǫ́ǫ́'

　　　1　 2　 3　　4 -5 -6

　　　pref+pref + cjg+subj+ cl + stem

　　　around(1+2), impf (3), 1p (4), swim (5+6)

　　　verb base: [na..łkǫ́ǫ́'] (swim around)

In this verb word the conjugational prefix conveys the imperfective viewpoint, one of the Modes. I will cite verb bases regularly with the first person and the imperfective viewpoint, according to the practice of Young and

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[1] The abstract root/stem consists of a set of stems, each associated with a different Verb Lexeme Category, or VCL, discussed in section 9.1.2 below.

[2] For instance, the Progressive Mode requires a particular lexical category, the Cursive.

Morgan (1987) (henceforth YM). Every verb base has a Mode morpheme[3] and at least one pronominal prefix.

The prefixes of the Navajo verb have fixed sequential positions that do not directly indicate their hierarchic relations. The traditional analysis has the form of a template with different positions and possible fillers, as indicated below: the Mode prefix is conjugational, the Subj(ect) and Obj(ect) prefixes are pronominal.

(3)   Surface order of prefixes

1	2	3	4	5	6	7	8	9	10
Pref	Pref	Plural	Obj	Subj	Pref	Mode	Subj	cl	Stem

The prefixes of Positions 1, 2, and 6, and the Modes (Position 7) are of interest here, because they convey information relevant to event structure in addition to the verb theme. The prefixes may be derivational, adverbial, thematic (the latter are mostly idiosyncratic with a given verb theme), or aspectual.[4]

9.1.2 *Event structure information in Navajo*

I assume that there are two components of an aspectual system, 'viewpoint' (perfective, imperfective, neutral) and 'situation type' (state, events of different kinds). 'Situation types' are semantic concepts, idealizations of types of situation determined by a cluster of temporal features. They are realized in the sentences of a language by the verb and its arguments. 'Viewpoint' makes semantically visible all or part of a situation; thus the entire event structure of a sentence must be available to viewpoint. Situation type and viewpoint together give the aspectual value of a sentence. This theory is developed in Smith (1991/7).

I will concentrate here on the component of situation type, another term for event structure. This chapter deals mainly with verb words that express events. For discussion of states and viewpoint in Navajo, see Smith (1991/7).

Morphemes of several classes interact to provide the event-structure information conveyed by a verb word. Within the verb base, the verb stem and derivational prefixes appear; also, a set of 'sub-aspectual prefixes' (YM), several of which affect event structure. Outside the verb base, two Modes contribute to event structure, as we will see shortly.

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[3] Stative verb bases have a fixed viewpoint morpheme that is inert semantically. Statives have the value of a 'neutral' aspectual viewpoint (Smith 1991/7; Smith et al. forthcoming).

[4] The topic of 'aspectual' prefixes is a complex question in Navajo linguistics. My own analysis is presented here. For discussion and comparison with other approaches, see Smith (1996).

The verb base is realized in one of several morphological forms, or Verb Lexeme Categories. The Verb Lexeme Categories are abstract constructs, each consisting of a set of stem shapes; some also have signature prefixes with which they always occur. Verb bases are realized in a given VLC, with an appropriate stem shape. For instance, consider (4), which gives the root ['AH] and its realization in several VLC categories (Young et al. 1992 (YMM): 6):

(4)   Verb Lexeme Category

['AH1] (movement of a flat object)

['áád], [na...'ah], ['ad], [yi...'ad], ['ał]

Each of the forms in square brackets is a different VLC of the root ['AH]; they represent minimal verb bases, the skeletons of verb words. A given verb base realizes one VLC. Every non-stative verb base belongs to a Verb Lexeme Category (VLC); most verb themes can be realized in more than one VLC. Stative verb bases do not participate in VLC variation. The Verb Lexeme Categories are also known as 'aspectual' categories in the literature. I use the more neutral term because although some VLCs have a clear semantic meaning, others do not (Smith 1991/7; 1996). The VLC categories do not affect or determine event structure in a consistent manner and will therefore not play a significant role in what follows. The categories are subtle and sometimes difficult to recognize.[5]

The VLCs fall into three classes: lexical, super-lexical, and formal. Lexical morphemes modify the meaning of a verb to produce a new verb denoting a type of action different from that denoted by the original verb, while super-lexical morphemes leave unaltered the basic meaning of the original verb base (Forsyth 1970: 19). The 'lexical' class of VLC gives information about the particulars of an event. There are two 'super-lexical' VLCs, the Cursive and the Continuative; both contribute to the viewpoint component and will not be discussed here. VLCs of the 'formal' class are required for well-formedness and have a contrastive value, but do not otherwise make an identifiable contribution to the verb base.

Three other morphemes that affect event structure belong to the class of 'sub-aspectual prefixes': the Inceptive, Terminative, and Seriative. The sub-aspectual prefixes are known as Reversionary, Semeliterative, Seriative, Inceptive, Terminative, and Prolongative. They contribute consistent semantic meanings to the verb base, roughly according to their labels. There are some

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[5] The VLCs were first posited in work by Hardy (1979) and Kari (1979); they are discussed in YM, YMM.

dependencies between sub-aspects and VLCs; more than one sub-aspect can appear in a single verb base.

Two of the Modes affect event structure, the Customary (also called the Usitative) and the Iterative. The other Modes consist of the viewpoints Imperfective, Progressive, Perfective; and the Future and the Optative.

9.2 Information in the verb word

Given the complexity of the Navajo verb word, it is reasonable to ask how to understand the meaning that it conveys. In this section I will unpack the information which may be expressed by verbs or verb words: by one or more morphemes, as in English, French, Chinese, etc.; or by several morphemes, as in Russian and Navajo.

I suggest that verbs convey information of three kinds, or tiers: Event structure, Qualia structure, and Argument structure. Event structure articulates the internal structure of the situation denoted by a verb base; Qualia structure gives the particulars of that situation; Argument structure identifies the participants in the situation. I will give a 'general representation' for verbs that brings out the relations between the tiers. This is information that any theory should include. The representation is somewhat similar to that outlined in Pustejovsky (1995), although it departs significantly from his in the notion of Qualia structure. Some of the information presented here is directly encoded in the lexical entry for a verb; some arises from the composite of forms in a clause or verb word. In section 9.4 I will show how such information can be encoded in the dynamic semantic structures of Discourse Representation Theory.

Event structure—or Situation Type—articulates the internal structure of the event or state expressed by verb or verb base. Situations, or events and states, are characterized according to the internal temporal properties of dynamism, telicity, and duration. I will abstract away from the property of duration. Although it is very important in Navajo (Smith 1991; 1996), duration does not pertain to event structure at this level. I will discuss atelic and telic events. I will use 'process' and 'transition' for atelic and telic events (the traditional Vendlerian terms include the feature of duration). States are static, without internal structure: they include 'know the answer', 'fear something', 'be tired'. Process events are homogenous, consisting of successive stages: for instance 'push a cart', 'sing songs', 'stroll in the park', 'cough'. Transition events are heterogeneous, consisting of a process and a final state: they include 'arrive', 'break a glass', 'open the door', 'build a house'. (5) gives a schematic

picture of each type of situation. The schemas will be important later when we come to consider sub-aspectual prefixes.

(5)   Schemas of event structure

    a.   State: S
              |
              e

    b.   Process
                  P
         / / | | \
        e1, e2.......en
        John walked around

    c.   Transition
                 T
            /   \
       Process   State
       e1...en   e
       Mary closed the door

    d.   E = Process: e1 = Process
       E = Transition: e1 = Process
                    e2 = State

The more compact notations in (5d) will appear in lexical representations.

Argument structure identifies the participants in the situation expressed by the verb base. An event may have one or more participants, or arguments. Each argument is associated with a particular semantic role, known as a 'thematic role'. Thematic roles include Agent, Theme, and others, as indicated in (6).

(6)   Argument Structure: Agent, Theme, Location, Instrument, etc.

The meaning of the thematic roles can be intuitively grasped by considering the types of event in which they appear. For instance, the transitive English verb *open* requires two participants, as in *Mary opened the window*: an Agent, which causes an opening event; and a Theme (the Figure), which undergoes the opening. The intransitive verb *open* has only one participant, as in *The window opened*; the verb does not directly involve an agent, although such a role may be implied.

Thematic roles are associated with different parts of event structure (Croft 1987). For instance, in a Transition event involving agency, the Agent is associated with bringing about a change of state, but not necessarily with the change itself. For some verbs the entity which undergoes the change is also the Agent, as with path verbs such as *walk* or *run*; the change is one of location.

The entity undergoing the change may be a Theme, as with the direct objects of *open* and *put*.

Qualia structure sets out the particulars of a situation expressed by the verb base. Situations vary in many ways, yet we particularize them according to a few general notions. The particulars that identify a given situation constitute its Qualia structure. To state these particulars we need a set of basic properties, primitives which underlie all kinds of situations. (7) lists a set of primitives, following Talmy (1985).

(7)   Figure, Motion, Ground, Path, Manner, Cause

These primitives organize in terms of spatial location and motion, and are intended to apply to situations generally. All events may be taken as having literal or metaphorical motion; states involve location which is maintained rather than changed. Using the primitives of (7), I shall say that the principal object of a situation is the Figure, whether it be moving or stationary. The Ground indicates the orientation of the Figure to its surroundings; the Path gives the direction of motion travelled; Manner, the manner of motion; and Cause, the agent that brings about the motion. I add one additional primitive to the list, that of final or resultant State. The notion of final State is needed to account for telic events, which involve motion and result in a change of state. Not all verbs or verb bases use the full set of primitives. Cause or agent is specified by many transitive verbs, but unspecified in many intransitives and passives: in English, compare transitive *break* as in *John broke the glass* to intransitive *break* as in *The glass broke*, or passive *break*, as in *The glass was broken*. The lexical representation of transitive *break* specifies an Agent participant, but that of the other two does not. Again, the English verb *run* specifies manner of motion, but the verb *go* does not. The Qualia structure representation for a given verb base contains only the primitives it specifies.

Before discussing Navajo verb words, I give a sample general lexical representation of a simple English verb, using the tripartite scheme.

(8)   General representation for the English verb *close*

EVENT = T: e1 = Process   ARG: Arg1 : = [1] Agent
           e2 = State   Arg2 : = [2] Theme
QUALIA: Cause = [1]
          Figure = [2]
          Motion (e1)
          State = (e2) closed

The Event structure for *close* indicates that the event denoted is a Transition, with two sub-events, e1 and e2; the Argument structure indicates two arguments, [1] and [2]. The representation links this information to Qualia structure. In Qualia structure, both sub-events and arguments are associated with particular primitives. Motion and final State realize the sub-events; arguments realize Cause and Figure. Recall the convention that only primitives which are relevant to a given verb form appear in the representation for that form. Manner does not appear in (8), since the verb *close* gives no information about it. The linguistic forms leading to the interpretation of transitive *close* as telic include the entire verb constellation, the verb and its arguments.

Using this format for the Navajo verb base, we can represent the information conveyed by each morpheme. All Navajo verb bases contain more than one morpheme, since even the simplest verb bases have a root and classifier and belong to a given stem set. Classifiers convey whether a verb base is intransitive, transitive, or passive, and other information (see section 9.5). Stem sets are associated with Verb Lexeme Categories; those VLCs that convey semantic information appear as such in the lexical representation. The others are indicated for their contrastive or strictly formal value, under Qualia; if a base belongs to one VLC, the possibility of others is precluded.

The representation makes clear how the prefixes and other morphemes contribute to the verb base. Most prefixes convey information in a predictable way, though there are some idiosyncratic cases; the latter are called 'thematic' in YM, YMM. Often a decompositional analysis of the Navajo verb root is appropriate, for instance, it is necessary for a class known as 'handling' verbs, which encode information about both Figure and Action (Talmy 1985; YMM).

The general lexical representation below parcels out the meanings of prefixes and verb stem, including decomposition of single morphemes as appropriate. (9) takes as an example a verb base with one adverbial prefix. The complete verb word (9a) includes conjugational and pronominal prefixes that are not part of the verb base. (9b) gives the verb base and (9c) represents the information conveyed by it. The event is a Transition, with a single argument. The prefix specifies both Path and resultant State. The VLC of this base does not contribute to semantic meaning; it appears in the lexical representation as a formal value, noted F.

(9) a. *'iilk'ooł*—a wave, ripple rolls away out of sight

  b. [ʼa . . . lkooł']

  c. EVENT = T: e1 = Process   ARG: Arg1: = [1] wave, flowing matter

        e2 = State

QUALIA:

> Figure = [1]
>
> Motion = rolls, ripples (e1)
>
> Path
>
> State (e2) 'a (away out of sight)
>
> VLC = F

The prefix contributes to the Qualia structure of the verb base; it does not affect Event structure nor Argument structure. Without the prefix, the verb base would be *yilk'oot*, which denotes a different event, roughly 'a wave arrives'. The combination of classifier and verb root is treated here as an unanalysed unit; a more complete representation might also state the contribution of the classifier (classifiers affect the factors of valence, transitivity, and causation).

This general representation gives the information in the Navajo verb base. Now we can consider the contribution of different morphemes to event structure, the main concern of this article.

9.3 The information of event structure in Navajo

9.3.1 *The event structure morphemes*

Information about event structure is contributed by the verb theme and derivational prefixes; the sub-aspectual prefixes; and Mode morphemes. I distinguish the sub-aspectual prefixes from the derivational prefixes; both appear in the verb base. The verb theme and derivational prefixes give basic information about event structure, determining the kind of event. The relevant mode and sub-aspectual prefixes contribute super-lexical or Qualia information.

There are seven contrasting Mode morphemes, appearing in the same syntactic position. They do not constitute a unified semantic class. The viewpoint Mode morphemes—Perfective, Imperfective, and Progressive—give information about aspectual viewpoint. They constitute the viewpoint component of the Navajo aspectual system (ignoring the Neutral viewpoint, not relevant here; for discussion see Smith et al. (forthcoming)). The Future mode indicates temporal location, locating an event in the future; the Optative is modal, indicating something desired.

Two modes contribute to event structure. The Customary indicates habitual action, a pattern of events (Krifka et al. 1995; Smith 2003). Customary verb words are semantically stative. Thus the Customary mode converts or coerces (Moens and Steedman 1987) an event verb base to a generalizing stative. The

Iterative conveys an ongoing event consisting of a series of repetitions, converting a single event verb base to a durative, atelic event (an Activity in the sense of Vendler (1957)).

I now turn to the class of 'sub-aspectual' prefixes. I shall discuss their meanings, their interactions, and whether their position in surface order consistently reflects their semantic scope in event structure.

9.3.2 *The sub-aspectual prefixes*

The six sub-aspectual prefixes contribute specific meanings to a verb base. I will go through them one by one. Three affect the Qualia structure of the verb base; two are super-lexical, contributing to Event structure; one morpheme belongs to both categories, accepting either Qualia structure or Event structure, depending on the verb base in which it appears.

The 'Reversionary' prefix *ná* conveys that the final state of a Transition is a return to a previous state. (10) gives a verb base with and without this prefix. The fixed position of a prefix in the surface verb is indicated by a number; following YM, the numbers go from left to right so that the innermost prefixes have the highest numbers.

(10) Reversionary, *ná* (Pos. 1d)

    a. k'éshdǫǫh

       straight +it+impf+subj+ straighten

       'I straighten it (as a nail).'

    b. k'ináshdǫǫh

       straight +revers+it+impf+subj+ straighten

       'I restraighten it.'

The Reversionary prefix does not affect the type of event involved, so it contributes to Qualia structure.

The 'Semeliterative' prefix *náá* conveys that an event is a single repetition of a previous event. Both verb bases in (11) have this prefix:

(11) Semeliterative, *náá* (Pos. 1e) an event is a

    a. ch'inááníshdááh

       out horiz -semelit-impf-subj-go

       'I go out again.'

    b. k'ináánáshdǫǫh

       straight +semelit+obj+impf+subj+ straighten

       'I straighten it again.'

The Semeliterative prefix contributes to Qualia structure, with a presupposition of a prior event.

The Seriative is more complex. The Seriative prefix *hi* appears with two different meanings: it marks verbal action as 'successive' or as 'inherently segmented' (YMM: 877). The two meanings appear with different classes of verb base, as illustrated:

(12)   Seriative: Successive Seriative—prefix *hi* (Pos. 6a)

      a1. tóshjeeh ʼahéénílmááz

          barrel-in a circle-it-perf-subj-roll

          'I roll the barrel around in a circle.'

      a2. tóshjeeh ʼahééhéłmááz

          barrel-in a circle-ser-it-perf-subj-roll

          'I roll the barrel around in a succession of circles.'

      b1. naaltsos chʼíníjaaʼ

          book out-them-perf-subj-carry

          'I carried the books out (in one load).'

      b2. naaltsos chʼéhą̄jaaʼ

          book   out-ser-them-perf-subj-carry

          'I carried the books out one after another.'

(13)   Segmentation Seriative—prefix *hi* (Pos. 6a)

      a. tsídii yah ʼahóócha'

        bird-into-an-enclosure away-ser-impf-subj-hop

        'The bird is hopping in.'

      b. hishghaał

        ser-impf-subj-move

        'I am wriggling.'

The two meanings are represented at different tiers of lexical structure. The successive seriative involves Event structure, since it affects the event globally; the segmentation seriative involves the particulars of action, or Qualia structure. For further discussion of the Seriative see Smith (2000) and Newbold (2002).

The Prolongative prefix *dini* appears only with telic event verb bases, and means continuation: an action or state is in effect for a prolonged period.

Thus, (14a2) conveys that a state continues, while (14b2) conveys that an action continues.

(14)   Prolongative: prefix *dini* (Pos. 6a–c)

    a1. chidí yas yiih yilwod

          car snow into-obj perf-subj-run

          'The car ran into the snow.'

    a2. chidí yas yiih dinoolwod

          car snow into-it prol-perf-asubj-run

          'The car ran into the snow (and stayed: got stuck).'

    b1. yíníshgééezh

          thematic-obj-perf-subj-stare

          'I look at it.'

    b2. diniishgééezh

          prol-obj-perf-subj-stare

          'I fix my gaze on it.'

The consistent meaning in a verb word with this prefix is captured informally by YM's label 'prolongative'. I have proposed a unified analysis in which the Prolongative affects Qualia structure. It specifies one particular of the resultant state of a Transition: that the state continues. This holds for both types of case given above: the first is a straightforward transition event, the second is an inceptive, the beginning of looking. The prolongative conveys that looking—the final state of the inceptive—continues. For more discussion of this prefix see Smith (2001).

    I now turn to the Inceptive, a super-lexical prefix which can be represented nicely with the mechanisms we have in place. There are several Inceptive prefixes in Navajo; two are given in (15):

(15)   Inceptive: prefix niki, ha (Pos. 1b); ni (Pos. 6), action begins

    a. tsinaa 'eełgóó niki'niłk̮ǫ́ǫ́'

         boat-toward start-it-perf-I-swim

         'I started to swim to the boat.'

    b. bilasáana bi'niiyą́ą́'

         apple it-start-Perf-I-eat

         'I started to eat the apple.'

Inceptives are super-lexical morphemes that focus narrowly on the beginning of an event.

In a basic-level transition, the final state is a state of rest (idealized, perhaps): a new state. But with an inceptive, the final state is an onging event, not a state of rest. (16) models a simple, basic-level Transition and an inceptive:

(16)   The effect of Inceptives on event structure

Basic-level Transition				Inceptive Transition		
(i)	(ii)	(iii)		(i)	(ii)	(iii)
rest	T	rest:new state		rest	T	ongoing event

Inceptives thus contribute both to Event structure and to Qualia structure. They turn a basic-level event into a derived event by coercion (Moens and Steedman 1987; Smith 1991/7). They require that the final state of the derived event continues, as in (17):

(17)   Lexical representation inceptive *niki*

      Event: $E+$ niki: $= e1 =$ process (inception)

                         $e2 =$ event $E2$

      Qualia: Final state: ongoing $E2$

The analysis of the Inceptive—and Terminative, just below—is not limited to Navajo, but holds for inceptive verbs and affixes generally.

Finally, the sub-aspectual Terminative prefix *ni* conveys that an event stops or finishes. Navajo does not distinguish between these two meanings. (18) illustrates.

(18)   Terminative: prefix *ni* (Pos. 1b, 6), action stops, finishes

    a. diyogi ninítł'ą́

       rug finish-it-Perf-I-weave

       'I stopped/finished weaving a rug.'

    b. nihoni'táál

       finish-Perf-I-sing a song

       'I stopped/finished singing a song.'

This prefix is semantically the mirror image of the Inceptive. It produces a derived Transition with a special initial stage. The initial stage of a basic-level event is idealized as a state of rest; in a Terminative event, however, the initial stage is part of an ongoing durative telic event.

(19)   Terminative Transition

    (i)   (ii)   (iii)

    ongoing event   T   rest:new state

    Event: $E + ni = T$: $c_1 = $ event E_2

                           $e_2 = $ state (termination)

    Qualia: Path: ongoing E_1

This completes the introduction to the sub-aspectual prefixes of Navajo. In terms of their contribution to lexical structure, there are two classes:

(20)   Sub-aspectual prefixes in the verb word

    Event structure: Seriative (a), Inceptive, Terminative

    Qualia structure: Semeliterative, Reversative, Prolongative, Seriative (b)

Recall that 'Seriative (a)' prefix denotes successive events, while 'Seriative (b)' denotes segmented action.

9.3.3 *Combinations of sub-aspectual prefixes*

The sub-aspectual prefixes are not mutually exclusive: more than one can appear in a verb word. In some combinations one prefix has scope over another. I shall ask whether, when they are in combination, the surface order reflects their semantic relation.

    If surface order reflects scopal semantic order, prefixes with wider scope appear to the right. The rationale for this assumption is that the verb root/stem is rightmost (Rice 2000). I will assume that Event structure is primary and Qualia structure is secondary, since the latter concerns the particulars of situations. I ask first whether Event structure prefixes consistently have scope over the Qualia structure prefixes. In the examples, I shall note sub-aspectual prefixes as 'E' and 'Q' according to whether they affect Event structure or Qualia structure.

(21)   Reversative and Prolongative

    chidí hashtłíish yiih ńdinoolwod

    car mud into-it rev-prol-perf-subj-run

    'The car runs back, stuck again in the mud.' (Q, Q)

(22)   Semeliterative and Prolongative

    chidí hashtłíish yiih náádinoolwod

    car mud into-it semel-prol-perf-it-run

    'Again a car runs into the mud and stays (stuck).' (Q, Q)

(23)   Reversative and Semeliterative
  ch'ínínáá' deełdlaad
  out-rev-semlit-impf-subj-came
  'The sun came back out again.' (Q, E)

(24)   Reversative and Inceptive
  nááhátin
  rev+ inceptive+impf+subj+freezes
  'The area freezes again.' (Q, E)

(25)   Seriative and Prolongative
  chidí hashtłiish yiih hidinijeeh
  car mud into-it ser-prol-perf-3+run
  'One after another the cars got stuck in the mud.' (Q, Q)

(26)   Inceptive and Prolongative
  a 'awéé' hadínéeshcha
   baby incpt-prol-subj-cry
   'The baby started to cry (and continued: cried and cried).' (E, Q)
  b ńdiníshchóó
   incpt-prol-impf-subj-eat leafy matter
   'I'm eating and eating on leafy matter (overeating).' (E, Q)

(26b), with two prefixes, conveys the prolongative of an inceptive event.[6] The inceptive creates the possibility of the Prolongative.

---

[6] Another interpretation would be the inception of an event with a prolonged final state, an 'inceptive prolongative'. Thus (26a) would mean 'The baby started on a prolonged crying bout', as Peggy Speas pointed out in discussion at a meeting in Tucson, where some of this material was presented. Although plausible, this is not the meaning conveyed by the combination of Inceptive and Prolongative prefixes. The inceptive prolongative meaning is conveyed by a different form altogether, the Repetitive, as in:

 hanádi'nilzhish 'start on a prolonged dance'

I thank Mary Ann Willie for discussion of this point, and for the example.
 There is morphological evidence for the 'prolongative inceptive' interpretation. It concerns the classifier characteristic of verb bases with Prolongative *dini*. This prefix always appears with a *d* or *l* classifier. (For simplicity, classifiers are not discussed here; but see Smith (2001).) Verb bases with prefixes both have the *d* classifier.

 hadínéeshcha
 incpt-prol-perf-subj-d cl-stem

 The presence of the *d* classifier suggests that the Prolongative is primary in these bases. It supports the interpretation given: if the Inceptive were primary we would not expect this classifier. I will assume that the prolongative-inceptive interpretation is correct.

The prefix order and scopal order for the cases examined are listed below. ← indicates right-to-left scopal semantic order, → left-to-right scopal semantic order.

(27)   Order and scope of sub-aspectual prefixes

    (21) Rev. + Prol.   Q, Q   →

    (22) Semelit. + Prol.   Q, Q   →

    (23) Rev. + Semelit.   Q, E   ←

    (24) Rev. + Incept.   Q, E   ←

    (25) Seriative (a) + Prol.   E, Q   →

    (26) Incept. + Prolong.   E, Q   ←

The list shows that there is no consistent scopal direction, and Event structure prefixes do not always have scope over Qualia structure prefixes.[7]

Now consider combinations of the sub-aspectual prefixes that affect Event Structure. Inceptive and Terminative are mutually exclusive, but the successive Seriative can appear with both. Since Inceptive and Terminative prefixes can appear in positions 1 and 6, either order might be possible. Each meaning is semantically reasonable in principle: one might start or finish a multiple event, or make multiple starts or endings. Only one order actually occurs, however, for both combinations, as illustrated in (28).

(28)   Inceptive and Seriative (E, E): beginning of a multiple event

    a. *di* (to start) *dishjááh* start to carry O along

    b. *hi* (ser) *hidishjááh*   start to carry plural objects in segments

    c. Seriative (a) + Inceptive: ← semantic order

The prefix order reflects the semantic order from left to right, as Rice predicts. The next examples combine a Seriative with a Terminative morpheme.

(29)   Seriative and Terminative (E, E): end of a multiple event

    a. *ni* (to stop) *ninishjááh*—stop carrying

    b. *hi* (ser) *niheshjááh*—stop carry (plural objects)

    c. Terminative + Seriative a → semantic order

---

[7] An interesting possibility, suggested by Rice (2000), is that prefixes at the same level have a consistent left-to-right scopal direction. Rice proposes this as a general constraint on Athabaskan languages. It does not appear to hold for Navajo, however—at least not at this level. For the Qualia sub-aspectual prefixes there are two plausible combinations and the semantic scopal direction is right to left, counter to the proposal.

Here the Terminative precedes, so that the prefix order reflects a semantic ordering from right to left. This is counter to Rice's prediction and different from the order in the previous example. I conclude that the surface order of sub-aspectual prefixes does not consistently reflect their semantic scopal relation.

9.4 Representing event structure

9.4.1 *Summary of event structure information*

Information from several sources interacts to convey event structure information in Navajo. The verb base, VLC, and certain sub-aspects determine basic event structure. Two Modes and three sub-aspects determine derived event structure.

(30)   The components of Event Structure (situation type)

Verb theme, derivational prefixes

Sub-aspect: Seriative (a), Inceptive, Terminative

Mode: Customary (derived habitual state); Iterative (derived atelic event)

Certain morphemes contribute to components other than Event structure. Three sub-aspectual prefixes contribute to Qualia structure, giving fine-grained information about internal temporal structure. The other modes convey aspectual viewpoint; the remaining two convey mood and/or temporality. VLCs also vary in semantic force: some VLCs contribute to Event structure, others to Qualia structure, and others are formal.

Recall that situation type and viewpoint give the composite aspectual value of a sentence. The entire event structure is available to viewpoint, which makes semantically visible all or part of it. Semantically, then, viewpoint has situation type within its scope.

I shall now discuss two different linguistic accounts of event structure in Navajo: the semantically based syntactic approach of Hale and Keyser and the surface-interpretation DRT approach of Kamp and Reyle (1993) and Smith (1991/7).

9.4.2 *The syntactic approach*

As outlined in the Introduction to this volume, Hale and Keyser take an approach that is driven by lexical and structural considerations. They develop a semantically based syntax with functional projections for grammatical morphemes. In the derivation of surface structure from underlying structure,

these projections provide landing sites for movement. There are several analyses of this kind that posit an Event Structure node hierarchically below the functional projections for aspectual viewpoint (e.g. Ramchand 1998). The information relevant to event structure is assembled below that node.

Approaching Navajo in the same spirit, generative accounts are proposed by Speas (1990) and Hale (2000). They derive the surface verb word from hierarchically organized constituents.[8] All generative studies of the Navajo language must deal with the considerable problem of getting the morphemes that give different kinds of information into the proper surface order—that of the traditional template. The main syntactic mechanism for doing this is head movement: a head moves to the closest head position which governs it. In deriving the surface verb word, the heads of sub-constituents are moved successively upward in the tree. The verb base is treated as a discontinuous morpheme, with the verb theme as head. The verb theme moves to the right of the Mode morpheme, giving the correct order. The phonological structure of the verb word is also relevant to the correct positioning of certain prefixes (McDonough 2000).

The most detailed account that I know of (Hale 2000) proposes a derivation of inceptive verb words, e.g. *deshnish* 'I start working'. The surface order of prefixes in the verb word is Inceptive+Mode+Subj+Stem. The highest functional projection realizes the inceptive morpheme; it dominates the Mode-Phrase, or MP, which has VP as its complement. The Mode morpheme is associated with the subject pronominal AgrS (Speas 1990; McDonough 2000). The schematic tree in (31) illustrates—abstracting away from matters not under discussion here.[9] The tree 'E' is the functional projection of the inceptive.

(31)   a.
             Surface order
             d-s-sh-lnish (I starting work)
             Inceptive+Mode (Impf)+Subj+Stem

         b.

---
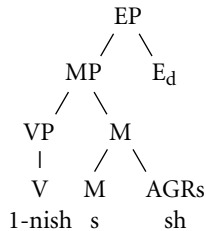
[8] Hale assumes a VP-internal subject that may optionally appear in Spec, VP. When it does appear, it moves to Spec, IP. Objects and object agreement are not discussed here.

[9] The inceptive has a rather intricate interaction with object pronominals; this is explored in Hale et al. (2000), using the same approach.

This structure enables a derivation in which the composite of verb theme head and mode head moves to the left to derive the correct surface order. The resulting string is *d-s-sh-l-nish*, which, with appropriate phonological adjustments, is converted to the surface verb word *deshnish*. The verb word has the imperfective viewpoint. The interpretation of (31), therefore, is that an inceptive event is in progress, as indicated by the English gloss. Viewpoint is not discussed in Hale (2000). To my knowledge, similarly detailed analyses of other verb words—with other inceptives in different positions, terminatives, seriatives—have not been developed (though see Rice and Saxon, forthcoming). I am sure that they could be, given the power of the system.

The analysis successfully derives the Navajo verb word from a lexical-and-configurational underlying structure. However, the derivation comes at a certain price. Neither the underlying nor the surface structure represents the semantic structure of the verb word. The desired surface order determines the position of functional projections. For verb words like *deshnish* the highest projection is EP, the inceptive. The inceptive contributes to event structure, as we have seen, so that we cannot identify a locus for event structure below the verb word. This is probably right for Navajo, since the components of event structure may be scattered both in underlying and in surface structure. Recall that event structure is affected by two Mode morphemes (the Customary and the Iterative) and by three sub-aspectual morphemes (inceptive, terminative, and seriative), as well as by the other components of the verb base.

One problem with a structure like (31) is that it does not provide the correct semantic scope for viewpoint. In the semantic interpretation of a verb word, the viewpoint morpheme is distinct from, and interacts with, event structure. This relationship is not represented in the structure above. Note that it would be difficult to give such a representation generally, given that the Mode morphemes do not constitute a unified semantic category. Another problem is that syntactic constituent structure does not have a direct relation to event structure in Navajo. The surface order of morphemes does not necessarily reflect the semantic scopal order, as demonstrated in section 9.3 above. An additional interpretive level is needed, even though the functional projections are intended to represent the semantics of event structure.

9.4.3 *The Discourse Representation Theory approach*

I suggest that a combination of generative and interpretive approaches, using the framework of Discourse Representation Theory (DRT), can successfully account for the syntax and semantics of the Navajo verb word. Phrase structure rules produce a relatively simple underlying structure that generates as a single unit the discontinuous morphemes of the verb base. Movement rules

produce the correct surface structure, and rules of interpretation construct semantic structure. The rules can look at the composite of information in the verb word, a particularly important advantage for Navajo.

The DRT approach constructs a semantic interpretation from syntactic surface structure, following Kamp and Reyle (1993). I assume a generative syntax on the Principles and Parameters model, perhaps close to the proposals of Speas (1990). The clause is headed by IP, in Navajo the set of Mode prefixes. Recall that these prefixes include aspectual viewpoint, temporal, modal, and event structure information.

The verb base is generated as a unit: the prefix constituent is the complement of the verb theme. The prefixes of the verb base are generated in order; how to do this exactly must be enumerated in the lexicon. As Speas proposed, the verb theme moves by head movement to the right of the head of Infl (Mode), thus deriving the correct surface order. The interpretation is carried out by rules of semantic interpretation.

For instance, the inceptive verb word above could be derived in this way. The underlying structure is sketched in (32). The MP projection dominating the clause and the inceptive is part of the prefix complement to the verb word. I assume that the surface subject appears in Spec, VP in underlying structure and moves in Spec, Infl. I do not consider argument structure here.

(32)   Alternative underlying structure for *deshnish* 'I start working'

```
                    InflP (Mode)
                    /  \
                Spec    Infl′
                        /  \
                      VP    M
                    / |     | \
                Spec  V′    s  sh(AgrS)
                      /  \
                  Comp    V
                    |     |
                    d     l-nish
```
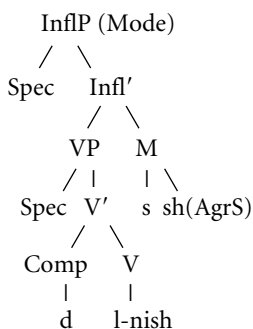
The prefixes appear as a separate constituent, a complement of V; they are generated in order. The complement may have two constituents, corresponding to the 'disjunct' and 'conjunct' prefixes of Navajo (YM; McDonough 1990; 2000). There is a phonological boundary between them.

The surface structure for (32) is *deshnish*; I assume that the inceptive prefix is recognizable according to a semantic feature associated with it. I also assume that the basic-level situation type of the verb base can be composed from

featural information associated with the prefix constituent and the verb theme. The composition of situation type depends on all the information in a clause. Let us limit the discussion to the simplest case, a verb word that functions as a complete sentence. Information that is relevant to situation type comes from the verb theme, the Mode morpheme, and the prefix constituent of the verb base; prefixes may indicate plurality, telicity (YM; Smith 1996). Compositional rules for situation type are discussed in Smith (1991/7).

Semantic interpretation is carried out by construction rules in DRT. The input to the rules is the syntactic surface structure of a clause, with associated semantic features; the output is a semantic representation (Kamp and Reyle 1993). Clauses license individual, temporal, and situation entities in the on-going semantic representation, the Discourse Representation Structure (DRS). Entities are characterized by conditions. The event structure of a clause is represented in the DRS by a situation entity—event or state—and a characterizing condition. The condition states the intensional aspectual properties of the entity's situation type.

Verb words introduce situation entities into a DRS. An inceptive verb word triggers the introduction of a telic event entity into the DRS: an entity characterized as a derived Transition event. Inceptives coerce a basic-level situation (whatever it is) to a Transition. The verb word *deshnish* is a very simple one: it consists of the verb theme *-nish* ('work', atelic), the inceptive prefix *d-*, the subject, and imperfective prefixes. I represent this information in (33).

(33)   Featural surface structure of *deshnish* 'I start working'
$$\text{Verb word}[_{\text{pref}}[\text{Inceptive }(+\text{ telic})]_{\text{Mode}}[\text{Subj Impf}]_{\text{Theme}}[\text{-telic}]]$$

The key point here is that the inceptive feature [+telic] overrides the verb theme feature [−telic]. This can be stated in a rule of interpretation, sketched in (34). The rule applies to a verb word with an inceptive morpheme in the prefix constituent and a verb theme that is telic or atelic; it allows for other prefixes, and any mode morpheme.

(34) $\text{Verb word}[_{\text{pref}}[\text{x Inceptive}(+\text{telic})\text{y}][\text{Mode}]_{\text{Theme}}[\pm\text{ telic}]]$
    $\rightarrow$ e (+telic)

The interpretation of the viewpoint morpheme is also carried out by rule, and provides that part of the inceptive event actually occurs at a given time.[10]

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[10] In DRT, temporal interpretation is accomplished by introducing temporal entities with each clause, and locating situations accordingly.

The other prefix morphemes that affect event structure can be treated along the same lines. The Inceptive has scope over the Seriative, and does not appear with the Terminative, as shown above. Therefore the Seriative need not appear in the coerced event structure. The Customary, a mode morpheme, would override the Inceptive: any sentence may be coerced to an habitual reading. A rule applying to a verb word with a Customary mode prefix would produce the correct structure.

This discussion has sketched an account of event structure. Recall that the general semantic interpretation of a verb word also has information about Argument structure and Qualia structure. Argument structure information is composed and introduced into the DRS in terms of the individual entities that correspond to different arguments of a clause. Qualia structure information is also introduced as detailed conditions in the DRS.

9.5 Conclusion

I have shown that different morphosyntactic classes of Navajo contribute to the Event structure of a verb word. There is no evidence supporting a syntactic category that corresponds to Event structure, however. The relevant morphemes should probably be treated in the syntax simply as prefixes of the verb base. Most often, the verb base is the locus of event structure information; but as we have seen, the Customary and Iterative mode morphemes also affect it.

The previous section compared the approach of semantically based syntax to that of DRT. Recall that, although the former can generate the correct morpheme order, further interpretation is necessary to arrive at the correct semantic interpretation of a Navajo verb word. In the latter approach the interpretation is constructed directly from surface structure. The study suggests that the Event structure interpretation of a Navajo verb word should assemble the relevant information from surface structure, as in DRT (Kamp and Reyle 1993).

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Part III
Lexical Restrictions on Syntax

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10

Constructions, Lexical Semantics, and the Correspondence Principle: Accounting for Generalizations and Subregularities in the Realization of Arguments

ADELE E. GOLDBERG

10.1 Introduction

There exist certain regularities in which arguments tend to be obligatorily expressed in languages like English. A number of researchers have put forward some version of an Argument Realization Principle (ARP) in order to capture these tendencies. In this chapter it is argued that analyses that invoke the ARP fail to account for open-ended classes of counter-examples. On the other hand, attention to constructions, detailed lexical semantics, and discourse factors allows us to account for the general tendencies and the productive and systematic classes of exceptions without unnecessary grammatical stipulation.

The present approach to grammar takes speakers' knowledge of language to consist of a network of learned pairings of form and function, or 'constructions'. Constructions are posited whenever there is evidence that speakers cannot predict some aspect of their form, function, or use from other knowledge of language (i.e. from other constructions already posited to exist).

Constructional approaches make a strong commitment to try ultimately to account for every aspect of knowledge of language. That is, the approach commits itself seriously to a criterion of descriptive adequacy. At the same time, the type of constructional approach adopted here demands that *motivation* be sought for each construction that is posited. Motivation aims to explain why it is at least possible, and at best natural, that this particular form–meaning correspondence should exist in a given language.[1] Motivation can be provided by (for example) appeal to constraints on acquisition, principles of grammaticalization, discourse demands, iconic principles, or general principles of categorization. The requirement that each construction must be motivated provides constructional approaches with explanatory adequacy.

It is the centrality of the language-specific construction, assumed to be learned on the basis of positive input, that sets constructional approaches apart from traditional generative theories, which often recognize only the most general patterns, failing to account for systematic subregularities that exist.

10.2 The Argument Realization Principle

The Argument Realization Principle has been proposed by a number of researchers:

> **Argument Realization Principle (ARP):**
>
> There must be one argument XP in the syntax to identify each sub-event in the event structure template (Grimshaw and Vikner 1993; van Hout 1996; Rappaport Hovav and Levin 1998; Kaufmann and Wunderlich 1998; Wright and Levin 2000; Rappaport Hovav and Levin 2001).[2]

The relevant sub-events alluded to in the ARP include simple actions, causes, and states as associated with the sort of decomposition familiar from Vendler (1967) and Dowty (1979), and provided in Table 10.1.

The ARP requires that at least one argument that is associated with each sub-event in an event structure template must be syntactically expressed.

---

[1] An account that fully motivates a given construction is ultimately responsible for demonstrating how the construction came to exist and how it can be learned by new generations of speakers.

[2] The original formulation by Grimshaw and Vikner (1993) allowed adjuncts as well as arguments to 'identify' a sub-event, but more recent formulations have stated the requirement more strictly, as stated above. See Goldberg and Ackerman (2001) for evidence that even the original formulation was too strong. Here, I will focus on the more restrictive formulation in terms of arguments, which seems to be receiving a lot of attention in the literature.

TABLE 10.1 Event structure templates (from Rappaport Hovav and Levin 1998: 108)

[x ACT<MANNER>]	(activity)
[x <STATE>]	(state)
[BECOME [x <STATE>]]	(achievement)
[[x ACT<MANNER>] CAUSE [BECOME [y <STATE>]]]	(accomplishment)

While several classes of systematic exceptions to the ARP are demonstrated below, the principle does account for certain general tendencies. One tendency is for a theme argument to be overtly expressed if a path of motion is predicated of it. For example, the ARP has been invoked in order to account for the unacceptability of example (1a) (Rappaport Hovav and Levin 1998). The message intended in (1a) is that of a caused change of location—an accomplishment, in the Dowty and Vender classification. As illustrated in (1b), the analysis assumes that there are two independent sub-events: the sweeping action and the motion of the dust onto the floor that is caused by the sweeping. The sweeping action is identified by the subject argument; the motion sub-event demands that the theme argument ('dust') be overtly realized as well. That is, the ARP requires that both arguments in boldface in (1b) be overtly expressed as they are in (1c).

(1)   a. *Phil swept onto the floor (Rappaport Hovav and Levin 1998: ex. 39, p. 120).

      b. **Phil** ACT<swept>

          BECOME [**dust** <onto the floor>]

      c. Phil swept the dust onto the floor.

A second prediction of the ARP is that causative verbs should obligatorily express the argument that undergoes the change of state in all contexts, since the change of state sub-event would have to correspond to some overt argument. That is, the decomposition of a causative expression such as *The owl killed its prey* is given in (2).

(2)   **The owl** ACT <killed>

      BECOME <**prey** killed>

The ARP stipulates that an argument must identify the second sub-event designating a change of state; therefore the patient argument must be overtly expressed. This claim has been made explicitly by a number of researchers (Browne 1971; Brisson 1994; van Hout 1996: 5–7; Rappaport Hovav and Levin

1998; Ritter and Rosen 1998; Levin and Rappaport Hovav, this volume). The idea is supported by the ill-formedness of the following examples:

(3)　a.　*The owl killed.
　　　b.　*Chris broke.

Finally, the ARP has been interpreted by some as a biconditional: each sub-event must be associated with one *and only one* syntactic argument. For example, verbs are claimed to be obligatorily transitive if and only if they designate complex events (Hovav Rappaport and Levin 1998). According to this claim, verbs that designate single events should never be obligatorily transitive, modulo an independent constraint that all arguments must be recoverable. As predicted, there are clear examples of single-event verbs that readily allow the omission of their second argument. Well-known instances include *drink, smoke, sing, bake, read* (Fellbaum and Kegl 1989; see also Fillmore 1986; Mittwoch, this volume).

10.3 Counter-examples to the ARP

The ARP initially may appear to be motivated by communicative demands. It may at first seem that the need for semantic recoverability could be invoked to explain why each sub-event must be represented in some way by an argument. However, the generalization must be relativized to English, since many languages allow any argument to be unexpressed as long as it represents given and non-contrastive information. This is true, for example, in Russian, Korean, Chinese, Japanese, Hindi, Hungarian, Arabic, Thai, and Laos (see e.g. Li and Thompson 1981; Huang 1984; Németh 2000). For instance, both arguments can be omitted in Russian in the following conversation (from Franks 1995), despite the fact that there are no arguments that correspond to either sub-event of the change-of-state verb *buy* (see section 10.3.2 below).

Russian
　　Q:　'Did Ivan buy a newspaper?'
　　A:　Net, ne kupil.
　　　　'No, (he) didn't buy (it).'
　　Q:　Did you introduce Ivan to Masha?
　　A:　Da, predstavil.
　　　　'Yes, (I) introduced (him) (to her).'

Let us, however, concentrate on the extent to which the proposed constraints hold in English. We will examine open-ended classes of counter-

examples that violate the generalizations above. These exceptional cases prompt us to consider constructional, detailed lexical-semantic and discourse factors, and ultimately lead to a deeper understanding of the general tendencies that exist.

10.3.1 *Theme arguments need not uniformly be expressed despite overtly predicated paths*

Examples (4–9) cast doubt on the generality of the explanation of (1a).

(1)   a.   *Phil swept onto the floor.

(4)   Margaret sneezed onto the computer screen.

(5)   Bill blew/cried into the paper bag.

(6)   Celia spit into the wind.

(7)   Nick ate off the floor.

(8)   Elaine drank from a cup.

(9)   The pipe leaked into the basement.

In each of examples (4–9) the theme argument is unexpressed, despite the appearance of an overt directional. It is mucus which moves onto the computer screen, air that moves into the bag, spit that moves into the wind, and so on. These examples stand in direct contrast to the unacceptable example with *sweep* in (1a). That is, the semantic decomposition of (4), given in (4b), is isomorphic with that of (1b) because both entail the caused motion of a theme to a location. Yet the possibilities of argument realization are distinct.

(4)   b.   **Pat** ACT<blew>

BECOME [**air** <onto the computer screen>]

It may be observed that *blow* and the other verbs in (4–9) are often classified as intransitive. Still, the principles of argument realization must apply to the semantic decompositions of propositions, not the semantics of verbs in isolation. The propositions expressed in (4–9) clearly involve two participants: there is an unexpressed theme argument that is caused to move to the location designated by the overt prepositional phrase. In fact, the verbs in examples (4–9) can optionally appear transitively:

(4′)   Margaret sneezed mucus onto the computer screen.

(5′)   Bill blew air into the paper bag.

(6′)   Celia spit saliva into the wind.

(7′)   Nick ate crumbs off the floor.

(8′)   Elaine drank bourbon from a cup.

(9′)   The pipe leaked water into the basement.

To summarize, the ARP would seem to require the overt expression of the theme argument in expressions that entail a caused change of location, and yet, as we saw in (4–9), the theme argument is at least optionally unexpressed in many cases.

In many of the acceptable examples (4–9), the verb semantically incorporates the theme argument, in the sense that the theme's existence and motion is entailed by the verb (cf. *blow, eat, drink*). The examples nonetheless stand as counter-examples to ARP, since this principle is supposed to explain the syntactic realization of arguments.

It might be argued that the semantics is directly reflected in the syntax, and that a direct object is syntactically incorporated into the verb in examples (4–9). ARP could thus be claimed to really be a constraint on a level of underlying representation. This type of account might garner support from the fact that the verb is occasionally morphologically related to the corresponding nominal form (*spit* in (6)). However, the felicity of other examples (e.g. (4,5)) undermines such an account, since the verbs *sneeze* and *blow* do not have nominal morphological counterparts corresponding to their respective theme arguments.

A proponent of a syntactic incorporation account might try to counter that *sneeze* and *blow* are actually derived from nouns, and that there is a morphological gap in that the nouns cannot be realized in bare form (cf. related proposals in Lakoff (1965); Hale and Keyser (1993)). However, such an account would still have to explain the difference between *sweep* in (1a) and the examples in (4–9). What is the independent evidence that would lead one to conclude that the verbs in (4–9) are, despite all appearances, derived from nouns while *sweep* is not?

Perhaps most fatal to an incorporation proposal is the fact that the theme arguments cannot be said to be semantically incorporated into the meanings of the verbs in all of the cases. Notice that it is quite possible to cry without tears and to sneeze expelling only air. While the relevant theme argument is semantically *recoverable*, as discussed below, it is not strictly entailed by the semantics of these verbs. Thus the syntactic incorporation account is not viable for these cases. Therefore, it must be concluded that semantic decomposition does not itself directly determine argument realization: the Argument Realization Principle cannot be correct as it stands.

The ARP is further undermined by the fact that verbs of emission and ingestion are not the only class of verbs that can appear without an overt theme argument, despite an overt directional phrase. Verbs of contribution, which happen to involve verbs that are intuitively more lexically transitive than verbs of emission, pattern the same way. Note that the understood theme argument in (10a), the contribution, is not overtly expressed despite the fact that the sentence entails its existence (see 10b):

(10) a. Pat contributed to the Leukemia Foundation.

  b. #Pat contributed to the Leukemia Foundation, but there was nothing she contributed.

Verbs of contribution seem to generally behave like *contribute*. For example, the verb *donate* is able to appear in this construction as well:

(11) She donated to the Leukemia Foundation.

The verb *give* normally requires the presence of a theme argument:

(12) *She gave to the girl.

However, when *give* is used with a meaning like that of *contribute* or *donate*, it too can appear without an overt theme argument:[3]

(13) She gave to the Leukemia Foundation.

To summarize, we have seen that verbs that can be construed as verbs of emission, ingestion, and contribution can readily appear without their theme argument expressed, even when an overt path is predicated of it. We return to offer a motivated account of examples such as those in (4–13) in section 10.5. The following two sections outline additional classes of counter-examples to the ARP.

10.3.2 *Patient argument of causative verbs need not always be overtly expressed*

Recall that the ARP predicts that causative events which have two sub-events should necessarily always have two overt arguments. We see below, however, that causative verbs often actually allow patient arguments to be omitted under certain discourse conditions. The following examples illustrate this phenomenon:[4]

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[3] The observation about *give* is due to Charles Fillmore (pers. commu., 1990).

[4] In an in-depth survey of various types of omitted argument, Cote (1996: 130 ff.) classifies omitted arguments of this type as 'Arbitrary Null Objects', but suggests that the class is highly lexically constrained to include *warn, advise, amuse* and closely related verbs with animate patient arguments. She further observes that the generic interpretation is often required. We see here that a great variety of

(14)   a. The chef-in-training chopped and diced all afternoon.

     b. Owls only kill at night.

     c. The famous lecturer always aimed to dazzle/please/disappoint/impress/charm.

     d. Pat gave and gave, but Chris just took and took.

     e. These revolutionary new brooms sweep cleaner than ever. (Aarts 1995: 85)

     f. The kindergartener cut in straight lines.

Clearly each of the examples in (14a–f) retains its change-of-state meaning. Example (14a) designates a scene in which something was chopped and diced, thus undergoing a change of state. Example (14b) designates a scene in which owls generically cause some unspecified animals to die; (14c) involves various psychological causative predicates; in (14d), Pat causes something to be given to Chris; (14e) involves an overt result phrase; and in (14f) some unspecified paper is caused to be cut. We return to offer an account of this type of exception in section 10.6. The following section observes a final set of counter-examples to the ARP.

10.3.3   *Some simple events are obligatorily transitive*

Levin and Rappaport Hovav (1998) and Wright and Levin (2000) adopt the ARP as a biconditional: there may be no more obligatory arguments than there are sub-events. Their argument rests on a single class of simple event verbs: verbs of surface contact. They argue that verbs of surface contact are never obligatorily transitive, as long as the omitted argument is semantically recoverable. However, there is at least one subclass of verbs of surface contact that systematically resists object omission. Consider the examples below involving the verbs of surface contact *pet*, *stroke*, and *caress*:

(15)   Context: Pat observes Chris petting a cat.

     Chris pet *(her) yesterday, too.

(16)   Context: Chris approaches a cat that is known to bite.

     You'd better not stroke *(it)!

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verbs can appear with this type of omitted argument, regardless of the animacy of the patient argument. Genericity does seem to be a sufficient, although not necessary, interpretation for the action as discussed below. These cases are a subtype of 'Indefinite Null Complementation' (Fillmore 1986), and would also fall under the heading of 'Lexically Conditioned Intransitivity' (Fellbaum and Kegl 1989), although I argue here that such expressions are licensed by a construction that applies broadly across lexical items.

(17)   Context: Pat and Bob were very affectionate at the restaurant.

They caressed *(each other) throughout the meal.

The contexts above make each of the omitted arguments semantically recoverable, and yet the second argument is nonetheless obligatorily expressed. If we consider other verbs that are stative or activities, and therefore according to the decompositions in Table 10.1 involve only a single event, we find other counter-examples, including the following:

(18)   a. *She drafted.
        b. *She imbibed.
        c. *She sautéed.

To summarize, we have seen several classes of counter-examples to the broad claim that each sub-event must be 'identified' by exactly one argument (the Argument Realization Principle). The principle was proposed on the basis of English data, but again many languages routinely allow arguments to be omitted where English does not. Therefore the ARP must be parameterized in some way to account for these differences. Moreover, even in English we have seen instances in which the motion sub-event is not necessarily identified by an overt argument, instances in which a causal sub-event is not necessarily identified by an overt argument, and instances in which there are two obligatory arguments despite there being only one event.

10.4 A constructional approach

What are the empirical generalizations? There appear to be two fairly robust generalizations as outlined in section 10.2. In English:

I.   If motion is predicated of a theme argument, the theme argument is *generally* overtly expressed.
II.   If a change of state is predicated of a patient argument, the patient argument is *generally* overtly expressed.

We return to account for the exceptions to these tendencies in sections 10.5–10.7, but the question we address first is: how can we motivate these empirical generalizations that the ARP was intended to capture?

There is a growing agreement that it is important to recognize a distinction between the frame semantics associated with a verb and the set of phrasal patterns or argument structure constructions that are available for expressing clauses (Gleitman et al. 1995; Goldberg 1992; 1995; forthcoming; Rappaport Hovav and Levin 1998; Iwata 2000; Jackendoff 1997; 2002; Kay 2001; Pinker

1994). Let us take it as a working assumption that the overt expression of arguments is determined by two interacting factors: lexical semantics and constructions. As noted in the section 10.1, constructions are conventional pairings of form and function.

Constructions that capture argument structure generalizations, like lexical predicates, have semantic roles associated with them; following Goldberg (1995), these are termed 'argument roles' and correspond roughly to traditional thematic roles such as agent, patient, instrument, source, theme, or location. At the same time, because they are defined in terms of the semantic requirements of particular constructions, argument roles in this framework are more specific and numerous than traditional thematic roles. The role labels are simply intended as shorthand to capture the semantic properties associated with slots in an argument structure construction.

Only certain argument roles are considered 'profiled', or particularly discourse-prominent.[5] In the case of simple English clauses, only roles that are realized as subject, direct object, or second object in ditransitives are considered profiled. These are the same grammatical relations that receive a special status in most theories as the set of 'terms' which correspond to 'core', 'nuclear', or 'direct' arguments. Roles encoded by the subject, object, or second object grammatical relations have a high degree of discourse prominence, typically being either topical or focal in the discourse (for arguments to this effect see Keenan 1976; 1984; Comrie 1984; Fillmore 1977*b*; Langacker 1987).

Argument roles capture generalizations over individual verbs' *participant roles*. That is, each verb is assumed to be conventionally associated with a certain number of participant roles. Only a subset of those roles, namely those roles that are *lexically profiled*, are obligatorily expressed, or, if unexpressed, receive a definite interpretation.[6] Lexical profiling, parallel to argument profiling, is designed to indicate which participant roles associated with a verb's meaning are obligatorily accessed, function as focal points within the scene, and achieve a special degree of prominence. Fillmore (1977*b*) similarly notes that certain participant roles are obligatorily 'brought into perspective', achieving a certain degree of 'salience'. The notion of lexical profiling is intended to be

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[5] The term 'profiling' is borrowed from Langacker (1987; 1991), who uses it in a slightly different way to capture which aspects of a rich semantic structure are designated by an expression. For example, the profiled entity corresponding to the concept *hypotenuse* is the longest line of a right triangle. The rest of the right triangle is part of the "base" of the concept *hypotenuse* and is not profiled.

[6] Again, this generalization is true for English. In many other languages, lexically profiled roles are also expressed by a small set of core grammatical relations, when they are expressed. However, in these other languages these arguments are frequently omitted under varying conditions: roughly when they are given and non-contrastive in the context.

a semantic one: it is a stable aspect of a word's meaning, and can differentiate the meaning difference between lexical items—cf. *buy* vs. *sell* (Fillmore 1977*b*) or *rob* vs. *steal* (Goldberg 1995). Certain types of argument role are inherently more likely than others to be profiled and therefore obligatorily expressed. For example, animate roles are generally more salient and central to the scene being expressed than place or location roles (Clark 1978; Goldberg 1995).

To summarize:

(A) Participant roles: roles associated with a sense of a verb

e.g. *sneeze* has one participant role, the sneezer; *kick* has two participant roles, the kicker and the kickee.

Profiled participant roles: a subset of participant roles that are normally obligatorily expressed or receive a definite interpretation in a language like English.

e.g. the sneezer role of *sneeze* is profiled; the kicker *kick* is also profiled but the kickee role is not since the kickee role is not obligatory (*The dancer kicked high*).

(B) Argument roles: roles associated with an argument structure construction

e.g., the agent, theme, recipient roles of the ditransitive construction or the cause, theme, path/location roles of the caused motion construction.

Profiled argument roles: roles of a construction that appear as subject, object, or second object of ditransitives, i.e. as particularly discourse-prominent grammatical relations.

A participant role of the verb must be 'fused' with an argument role of a construction in order for it to be overtly expressed.[7] Fusion can be considered a type of unification in that the constraints on both roles must be simultaneously met by the argument instantiating the two roles.

Two principles constrain the ways in which the participant roles of a verb and the argument roles of a construction can be fused: the Semantic Coherence Principle and the Correspondence Principle, as stated in (C) and (D) below:

(C) The Semantic Coherence Principle: the participant role of the verb and the argument role of the construction must be semantically compatible. In particular, the more specific participant role of the verb must be

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[7] The term 'fusion' is adapted from Jackendoff's (1990) use of the same term to refer to the combination of two sets of semantic constraints on distinct but co-indexed slots within a given lexical entry; the term is used here to designate the relation holding between a participant role of a verb and an argument role of a construction when the two are simultaneously instantiated by one argument.

construable as an instance of the more general argument role. General categorization processes are responsible for this categorization task and it is always operative.

(D) The Correspondence Principle: the semantically salient profiled participant roles are encoded by grammatical relations that provide them a sufficient degree of discourse prominence, i.e. by profiled argument roles. An exception arises if a verb has three profiled roles; in this case, one can be represented by an unprofiled argument role (and realized as an oblique argument). The Correspondence Principle can be overridden by specifications of particular constructions.

The Correspondence Principle ensures that lexical semantics and discourse pragmatics are in general aligned. In particular, it requires that profiled participant roles are encoded by grammatical relations that provide them a sufficient degree of discourse prominence. The intuition is that the participants that are highly relevant to a verb's meaning are likely to be ones that are relevant or important to the discourse, since this particular verb was chosen from among other lexical alternatives.

Importantly, the Correspondence Principle is a default principle. Certain constructions can specifically override it in various ways. For example, constructions can increase the prominence of an argument (e.g. Topicalization, Cleft constructions), and constructions can also de-emphasize a particular argument. The construction that is to be the focus of section 10.6 is an instance of the latter type, involving the de-emphasis of what is normally a profiled participant role.

These definitions and principles are not ad hoc, in the sense that they were designed to account for the interactions of verbs with a number of different constructions including the ditransitive, the resultative (intransitive and transitive), the 'locative' alternation, and the caused-motion constructions (intransitive and transitive) (see Goldberg 1995; 2002).

With these basic definitions and principles in mind, we can account for the general tendencies in (I) and (II), repeated below, without any grammatical stipulation whatsoever.

I.   If motion is predicated of a theme argument, the theme argument is generally overtly expressed.
II. If a change of state is predicated of a patient argument, the patient argument is generally overtly expressed.

The theme argument of a change of location predication and a patient argument of a change of state predicate are normally *profiled*—i.e. they are

central participants within the scene and are obligatorily accessed for the semantic representation of the scene. One typically does not assert that a participant changes state or location unless one wishes to discuss or draw attention to that participant. The default Correspondence Principle ensures that profiled participants will be overtly expressed in languages like English.[8] Thus the semantics of change-of-state and change-of-location predications, together with the Correspondence Principle, accounts straightforwardly for the generalizations in (I) and (II).

Because the Correspondence Principle is a default principle, we expect there to be other constructions which explicitly serve to allow for particular contexts in which a theme or patient argument is intended to be de-emphasized in the discourse. The following two sections propose and motivate two such constructions, the Implicit Theme Construction and the Deprofiled Object Construction. These constructions are argued to account for the type of exceptions we saw to (I) and (II) in sections 10.3.1 and 10.3.2.

10.5 The Implicit Theme Construction

In this section we account for facts discussed in section 10.3.1. Recall that verbs of emission, ingestion, and contribution can appear without an overtly expressed theme argument, violating the tendency in (I). These facts can naturally be accounted for by recognizing the existence of a particular grammaticalized construction in the grammar of English: the Implicit Theme Construction. The identity of the theme argument is semantically recoverable by an inference (or in some cases an entailment) based on the meaning of the verb. The construction conventionally appears only with certain classes of verbs: verbs of emission, ingestion, and contribution. *Sweep* does not occur in this construction because it cannot be construed as falling into one of these classes (recall (1a) **Phil swept onto the floor*). The construction can be represented as in Figure 10.1.

Semantics:	CAUSE-MOTION	(**source**	theme	direction)

Semantics: CAUSE-MOTION   (**source**   theme   direction)
                      | | ⋮   ⋮

PRED emission, ingestion, contribution (   )
Syntax: Subj   Ø   Oblique

FIGURE 10.1 The Implicit Theme Construction

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[8] Moreover, it predicts that they will be expressed as core grammatical relations, which they are.

The top line of Figure 10.1 represents the semantics of the construction: the caused motion of a theme from a source in a particular direction. Figure 10.1 also specifies the way the semantic arguments are overtly realized syntactically: the source argument is linked with the subject, the location/direction argument is linked with an oblique argument, and the theme argument is unexpressed. PRED represents a variable over verb meaning. In Figure 10.1, PRED is subscripted with the particular verb classes that can appear in this construction. Lines between argument roles and participant roles of the verb are of two types: solid lines indicate that the construction's argument role *must* be fused with a participant role of the verb; dashed lines indicate that the argument role *may* be fused with a participant role of the verb but may alternatively be contributed solely by the construction. Profiled argument and participant roles are indicated by boldface.

Meaningful differences between individual expressions can be attributed to differences in lexical items. For example, *blow*, as a verb of emission, requires that the person blowing be agentive; *sneeze* only requires that the person sneezing be a source. These facts are captured since each argument must satisfy both the argument role of the construction and the participant role of the verb. The agentivity of *blow* comes from the verb; the construction only demands a *source* role.

A few examples may be useful. In the case of verbs of contribution, the combination of verb and construction is as in Figure 10.2.

In this case, a participant role of the verb is fused with each one of the argument roles of the construction. In accord with the Principle of Semantic Coherence, the contributor role is fused with the source role since the contributor can be construed as a type of source; similarly the contribution role is fused with the theme, and the goal role is fused with the direction, since the first can in both cases be construed as an instance of the second. The construction ensures that the theme/contribution role is not overtly expressed.

In the case of verbs of emission such as *sneeze*, the single profiled sneezer participant is fused with the source argument of the construction. The implicit theme argument and the overt directional are contributed by the construction

Semantics: CAUSE-MOTION   (**source**   theme   direction)
               | | ⋮   ⋮
            contribute   (**contributor**   *contribution*   *goal*)

Syntax: Subj   Ø   Oblique

FIGURE 10.2 The Implicit Theme Construction with *contribute*

Semantics:	CAUSE-MOTION	(**source**	theme	direction)
	|	|	⋮	⋮
	sneeze	(***sneezer***		)
Syntax:		Subj	Ø	Oblique

FIGURE 10.3 The Implicit Theme Construction with *sneeze*

to yield examples such as *Margaret sneezed onto the computer screen*, as represented in Figure 10.3.

Because *sneeze* must be construed as a verb of emission in order to appear in this construction, the implicit theme argument must be some type of emission, and not some external object such as a napkin. That is 19a is not an available interpretation for 19b:

(19)   a.   Pat sneezed the napkin onto the floor.≠

       b.   Pat sneezed onto the floor.

It might be suggested that all of the examples cited in section 10.3.1 should be accounted for by specifying separate special lexical entries for each of the verbs involved, instead of positing a construction. For example, *contribute* might quite plausibly have the following entry directly: < contributor (contribution) goal >, where the theme argument is stipulated to be optional. The examples would still be exceptions to the ARP, but this move would limit the exceptions to a closed class of lexical exceptions. Arguing against such an approach is the fact that positing additional lexical entries or verb senses fails to account for the generalization within and across verb classes. That is, stipulating additional lexical entries would not capture the fact that all verbs of emission act alike nor the fact that there are strong parallels among the class of verbs of emission, ingestion, and contribution. Lexical stipulation also fails to capture the open-ended nature of the examples. Any (potentially intransitive) verb that can be construed as a verb of emission, ingestion, or contribution can appear with an overt directional. By recognizing the construction as a generalization over many different verb uses, we are in a position to ask what the motivation for the construction might be. This question is addressed in the following section.

10.5.1 *Motivating the Implicit Theme Construction*

As noted in Section 10.1, it is necessary to motivate the construction if we wish it to be explanatory. As many have noted, semantic recoverability is a necessary condition on argument omission (cf. Rice 1988; Fellbaum and Kegl 1989;

Resnik 1993; Cote 1996; Lambrecht and Lemoine 1995; Goldberg 2000). Speakers will simply not be understood if they refer to unexpressed arguments that are not recoverable in context. Importantly, the unexpressed theme argument is semantically recoverable for verbs of emission, ingestion, and contribution.[9]

In addition, as noted above, all the verbs that can appear with a directional and without a theme can also appear intransitively without the directional. That is, the theme-type argument of the verb is not lexically profiled (obligatory), even as it is used in other contexts.

At the same time, semantic recoverability is not a sufficient constraint. The theme argument of *sweep* in (1a), namely dust, is also recoverable, and yet this example is categorically unacceptable. It seems that we need to recognize classes of verbs that are conventionally allowed (cf. also Pinker 1989; Levin 1993; Goldberg 1995).

10.6 The deprofiled object construction: omission under low discourse prominence

In this section, we account for examples (14a–f) in 10.3.2 (e.g. *Owls only kill at night*). As noted above, the semantic requirement of recoverability must be satisfied, and, as expected, it is satisfied in each of these. A further discourse condition is necessary to license the object omission in this type of example:

Principle of Omission under Low Discourse Prominence: Omission of the patient argument is possible when the patient argument is construed to be de-emphasized in the discourse vis à vis the action.

That is, omission is possible when the patient argument is not *topical* (or *focal*) in the discourse, and the action is particularly *emphasized* (via repetition, strong affective stance, contrastive focus, etc.) (Goldberg 2000).

The definition of 'focus' assumed in the characterization above is a traditional one. Halliday (1967: 204), for example, writes: 'Information focus is one kind of emphasis, that whereby the speaker marks out a part (which may be the whole) of a message block as that which he wishes to be interpreted as informative.' Similarly Lambrecht (1994: 218) defines the focus relation as relating 'the pragmatically non-recoverable to the recoverable component of

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⁹ Goldberg (forthcoming) suggested that concerns about politeness further motivated this construction, since it is often not polite to mention bodily emissions on one hand or amounts of money that are donated on the other. Recognition that verbs of ingestion can occur in this construction as well as verbs of emission (as pointed out to me by Ray Jackendoff, pers. commu.), however, weakens the idea that the construction is motivated by politeness, since it is a rare context where it would be impolite to mention particular food or drinks.

a proposition and thereby [creating] a new state of information in the mind of the addressee'. Cross-linguistically, focal elements must be expressed. This follows from the fact that they are not predictable: they must be expressed in order to be identified.

A topic can be defined as a 'matter of [already established] current interest which a statement is about and with respect to which a proposition is to be interpreted as relevant' (Lambrecht 1994: 119; see also Gundel 1988: 210). Thus a topical argument is an argument that is both given or recoverable, and about which the proposition is relevant. It follows from this definition that topicality should be recognized as a matter of degree: a proposition can be relevant to an argument to more or less extent. As a very weak necessary condition on topicality, we can use the criterion of anaphoricity. Arguments that are at all topical should be available for subsequent anaphoric reference, since they are by definition elements that are *relevant* to the discourse. As predicted, since the omitted arguments are by hypothesis non-topical, they do not provide ready discourse antecedents:[10]

(20)   The owl only kills at night. *It is easier to catch then.

(21)   The chef chopped and diced all day. *It was put into a large bowl.

While English normally requires that topical elements be expressed, the Principle above allows for them to be omitted when the action is particularly emphasized. 'Emphasis' is intended as a cover term for several different ways in which an action is construed to be especially prominent in the discourse. These include the following:

(22)   Pat gave and gave but Chris just took and took.   [Repeated Action]

(23)   Owls only kill at night.   [Generic Action]

(24)   She picked up her carving knife and began to chop.   [Narrow Focus]

(25)   Why would they give this creep a light prison term!? He murdered![11] [Strong Affective Stance]

(26)   She stole but she could not rob. (The Beatles, 'She Came in Through the Bathroom Window') [Contrastive Focus]

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[10] The anaphoricity condition is a necessary but not sufficient condition on topicality, since focal elements, being discourse-prominent, are also available for subsequent anaphoric reference.

[11] This telic example suggests that the relevant generalization is not aspectual. With Mittwoch (this volume, section 11.2.4), we are suggesting that backgrounded objects are candidates for omission. Unlike Mittwoch, we are suggesting that the verbal predicate is typically emphasized in the DOC construction.

Languages differ in their grammatical possibilities for argument omission. Again, no languages allow focal elements to be omitted. In many languages, including Chinese, Japanese, Korean, Hindi, Hungarian, and Laos, any topical argument (or, more generally, any given argument) that is non-contrastive can be omitted. In English, with a few lexical exceptions (cf. Fillmore 1986), all topical arguments must be expressed. However what we have seen in this section is that if the action is particularly emphasized (by repetition, contrast, etc.), it is possible to omit arguments that are both predictable (non-focal) and non-relevant (non-topical) in English. This combination of discourse and syntactic characteristics can be represented by Figure 10.4.

The top line in Figure 10.4 captures the pragmatic constraints on the construction. In particular, the predicate is emphasized (indicated by the underlined and boldface **P**), and the patient or theme profiled participant role is de-emphasized in being both non-topical and non-focal. The fact that the theme or patient argument is omitted syntactically is captured by Ø.

10.6.1 *Motivation for the Deprofiled Object Construction*

Motivation for the construction comes from the fact that it is not necessary to mention non-focal, non-topical arguments since they are predictable and non-relevant in the discourse. Following Grice's maxim of Quantity (second half) to 'say no more than is necessary', there is motivation to leave these particular arguments out.

Moreover, the fact that the predicate must be emphasized in some way indicates that the construction may be further motivated by a different kind of quantity generalization. There appears to be some kind of trade-off in just how much information is expressed by the object vs. the predicate. That is, the object seems more likely to be de-emphasized to the point of being omissible when the predicate is emphasized. Precedent for this general type of trade-off exists. For example, Brown (forthcoming) finds that in Tzeltal, semantically

Prag: **P̲**   (....   patient/theme   )

     (emphasized)   (de-emphasized: non-topical, non-focal)

        | |

     Pred   (....   **patient/theme**   )

Syn: V   Subj   Ø

FIGURE 10.4 Deprofiled Object Construction (DOC)

'heavier' verbs are more likely to allow object omission; for example, *k'ux* 'eat mush stuff' allows object omission more readily than *tun* 'eat (anything)'. Cacoullous and Hernández (1999) likewise document the use of Mexican Spanish *le* as an intensifier, which they describe as emphasizing the verb by de-emphasizing the object argument. Other generalizations about how much is naturally expressed in a given clause have been proposed previously (Givón 1975; Chafe 1987; DuBois 1987).[12] These precedents make the generalizations about the DOC more natural or motivated.

We have accounted for instances in which an argument that the ARP predicts should necessarily be expressed is in fact omitted. In the following section we address the converse phenomenon: arguments that the ARP predicts should be omissible without special context, but which are nonetheless obligatory (except as expected under the discourse conditions captured by the Deprofiled Object Construction (DOC) construction of this section).

10.7 Accounting for *smoke*-type verbs

In this section we first address the question of why a certain class of normally transitive verb readily appears intransitively. These verbs include *smoke, drink, sing*, and *write*. The ARP predicts that they should be optionally intransitive, and in fact they are. Notice that discourse constraints described in the previous section do not need to hold in order for these verbs to appear intransitively. The action need not be emphasized; it is possible to say, for example, *Pat smoked today*, if only a single instance of smoking occurred and there is no other type of contextual emphasis.

Interestingly, the same set of verbs occurs frequently in a context that does fall within the purview of the DOC construction: in generic contexts with a habitual interpretation: e.g. *Pat smokes; Pat drinks; Chris sings; Sam writes* (see also Mittwoch, this volume). The frequent appearance of the verbs in this context has apparently led to the grammaticalization of a lexical option for these verbs, whereby they can appear intransitively in less constrained contexts. That is, if a verb appears frequently in a particular discourse context, which generally allows the omission of the non-subject argument, the omission may over time become a conventional or grammaticalized option for that verb, through a process of reanalysis. Listeners reanalyse the frequently encountered intransitive use of the verb as a lexical option instead of as

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[12] There is a difference between the Givón–Chafe–DuBois generalization, 'Prefer only one lexical mention per clause', in that we have not claimed that there is a preference for object omission in the DOC context, only that the context allows for omission.

being licensed by the particular discourse context via the DOC construction.[13] More specifically, while the verb *drink* clearly has two participant roles, the drinker and the liquid, the liquid role is not profiled and thus can be omitted. Supporting the idea that the high frequency of these verbs was crucial to their historical reanalysis is the fact that verbs which are near-synonyms but which have lower frequencies do not readily allow object omission:

(27)   Pat drank/#imbibed last night.

(28)   Pat read/#perused last night.

(29)   Pat wrote/#drafted last night.

Low-frequency verbs such as *imbibe, peruse*, and *draft* do not appear frequently in the DOC context since they do not have very high overall frequency. Thus their possible but rare appearance in the DOC context has not enabled a reanalysis to occur in which the intransitive use is understood to be a lexical option. Thus recognizing the DOC can motivate both currently productive cases and also lexicalized 'idiosyncratic' cases. The failure of the verbs such as *imbibe, peruse*, and *draft* to appear intransitively is unexpected, on the other hand, by an account that claims that any single-event verb should be able to appear intransitively.

Other obligatorily transitive verbs with simple event structure directly contradict the predictions of the ARP. These include the verbs of surface contact mentioned in section 10.3.3: *pet, stroke*, and *caress*. The transitivity of these particular verbs can be motivated by their lexical semantics: we normally *pet, stroke*, or *caress* animate beings. Animate participants are typically prominent in the discourse (cf. Clark 1978; Goldberg 1995). That is, animate participant roles tend to be profiled, and therefore normally need to be expressed in languages like English that require the expression of profiled participants. Of course, in the special discourse context captured by the DOC construction, they can (as expected) be made less prominent, and therefore omitted:

(30)   The devoted zoo-keeper *patted* and *stroked* all day.

(31)   The well-trained masseuse always *caressed* with a firm hand.

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[13] It is sometimes claimed that this use of *drink* necessarily implies that Pat drinks alcohol. As Cote (1996) observes, it is possible to use *drink* intransitively in a context in which Pat is a patient who just had an operation on her oesophagus, in which case her ability to drink anything at all could be at issue. At the same time, the fact that the generic sentence *Pat drinks* is most commonly uttered in contexts in which alcohol is the relevant beverage gives further credence to the idea that the lexical option has arisen historically from repeated use in the generic context.

Of course, arguments do not need to be animate in order to be prominent and lexically profiled. Since profiled status is taken to be lexically determined, we expect there to be still other transitive verbs with simple event structure. And in fact other exceptions are not hard to come by. For example, single-event statives including *like, hate, weigh, cost* are all obligatorily two-argument verbs.

10.8 Conclusion

The Argument Realization Principle claims that each sub-event must be 'identified' by exactly one overt argument. However, we have observed that this is blatantly contradicted by many languages in which no overt arguments are strictly obligatory. Moreover, even in English, the proposal is counter-exemplified by expressions in which a motion sub-event is not necessarily identified (section 10.3.1) and instances in which a causal sub-event is not necessarily identified (section 10.3.2). Moreover, there are clear instances of verbs with two obligatory arguments despite having only one sub-event (section 10.3.3).

The accurate empirical generalizations are these:

In English,

  I. the theme argument is *generally* expressed if a path is predicated of it;
 II. the patient argument is *generally* expressed if a change of state is predicated of it.

These general tendencies were argued to follow from the nature of profiling and the Correspondence Principle: arguments that are particularly prominent are normally obligatorily expressed. Moreover, they are normally expressed by certain 'core' grammatical relations.

Two classes of exceptions to these general tendencies have been identified, and independently motivated constructions have been posited to capture their systematic nature. Exceptions to the idea that a theme argument is necessarily expressed if a path is predicated of it were captured by the Implicit Theme Construction. Exceptions to the second tendency were captured by the Deprofiled Object Construction.

Cross-linguistic differences are captured in two ways. First, the status of profiled participant roles differs cross-linguistically. While in English profiled participants are necessarily expressed unless a specific construction serves to de-emphasize them, in many if not most languages they are necessarily expressed only if they are not given or if they are focal. The Principle of Correspondence is presumed to be the same across languages insofar as

lexically profiled roles are expressed by core grammatical relations *when they are expressed.* The inventory of constructions is a second source of cross-linguistic variation. We have seen that each construction is motivated, but its existence is not strictly predictable. Thus the inventory of constructions is expected to differ cross-linguistically.

We have seen that sweeping generalizations which are intended to be exceptionless are oversimplified. The Correspondence Principle captures the tendency to align lexical and discourse prominence and allows us to capture the observed general tendencies. At the same time, this principle can be overridden by the specifications of particular constructions. Perhaps the most central reason for there being more than one possible construction available to express a given proposition is that the variety of constructions provide alternative ways of packaging information structure (Lambrecht 1994). We have seen examples of constructions that serve to de-emphasize an argument: the Implicit Theme Construction and the Deprofiled Object Construction. Attention to these specific constructions and their motivation allows us to account for open-ended classes of exceptions to the general tendencies noted above.

One might attempt to criticize the constructional approach by claiming that the constructions are ad hoc means of accounting for exceptional cases. However, each construction is motivated by independent factors. The Deprofiled Object Construction is motivated by the idea that arguments that are not prominent in the discourse need not be expressed. The Implicit Theme Construction is motivated by the high degree of semantic predictability of the omitted argument. Therefore, these constructions serve clear communicative functions: that is, their existence is motivated and not arbitrary or ad hoc. Moreover, the general tendencies are naturally captured by the Correspondence Principle, together with an understanding of which arguments are likely to be lexically profiled.

11

Unspecified Arguments in Episodic and Habitual Sentences

ANITA MITTWOCH

This chapter deals with the omission or optionality of unspecified objects with transitive verbs.[1] This phenomenon has usually been treated as a matter of lexical properties of particular verbs or classes of verbs, and tends to be discussed without taking into account the context in which it occurs. This has led to a rather idealized view of the phenomenon. I shall show that there are many cases that are heavily context-dependent.

Section 11.1 deals with episodic sentences. It begins with a brief survey of the most typical cases, e.g. *She is eating*, and suggests a very general minimal context that is sufficient for unspecified object drop with verbs belonging to this category. It then goes on to discuss more marginal cases that require considerably more context to license them. Section 11.2 discusses examples of habitual uses of verbs, where the lexicon interacts with more general properties of the sentence, particularly aspectual ones. Missing objects are much commoner in habitual sentences than in episodic ones. The main reason for this difference, it will be suggested, is the greater likelihood for objects in such sentences to be interpreted as unquantized; if present, the objects would be in the restrictor and therefore backgrounded.

[1] I am not concerned here with the zero arguments found in many languages as alternatives to unstressed anaphoric pronouns, as in the Hebrew examples below:

(i) hu šalax li mixtav aval lo kibalti Ø
     he sent me letter but not received-I (it)

(ii) hu hizi‘a li ugiyot aval lo lakaxti Ø
     he offered me biscuits but not took-I (one / any)

For a discussion on this phenomenon in Russian see Gundel (1980). Zero definite anaphora is rare in English; a few examples will be cited in (55) in the text.

11.1 Unspecified arguments in episodic sentences

11.1.1 *Core cases*

There is a well-known transitivity alternation involving a class of common process verbs which can be both transitive and intransitive with the same subject argument, so that the intransitive variety is unergative:

(1)   John is reading / drinking.

    John is reading a letter / drinking juice.

A representative list of English verbs participating in the alternation as it will be understood here is given in (2).

(2)   a. read, study, revise (what has been learnt) rehearse, practise

     b. sing, dance, play (music), act

     c. write, compose (music) paint (a picture), draw, etch, sew, knit, crochet, weave, spin, cook, bake[2]

     d. type, print, photocopy, dictate, record, film

     e. eat, drink, chew, smoke

     f. sow, plough, harvest, weed, hunt

     g. wash, iron, mend, darn, clean, sweep, dust, hoover, paint (apply paint to), embroider, tidy up

The verbs all have a pronounced manner component in their meaning, and fairly circumscribed selection restrictions. Hence the content of the phantom object is more or less predictable. It will correspond to the literal rather than metaphorical meaning of the verb (e.g. *read* written or printed material rather than, say, the stars or coffee grounds) and may be further restricted in usage (e.g. the understood object of intransitive *clean* in *he is cleaning* is the interior of a house, rather than a car, shoes or teeth; that of *mend* is clothes rather than electric gadgets or roads).[3]

Aspectually, intransitive predicates with these verbs pattern together, as atelics, with VPs consisting of transitive verbs + bare NP objects [−DELIMITED QUANTITY], whereas transitive verbs + quantized object yield telic VPs.

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[2] Note that objectless *cook* and *bake* are verbs of creation rather than transitive change-of-state verbs. *He is baking* can be said of someone kneading dough.

[3] It is sometimes claimed that in such restrictions the omitted object is prototypical. As an attempt at explanation, this risks circularity. What makes us regard the interior of a house as a 'prototypical' object of the verb *clean* is precisely the fact that it is typically 'understood' in the absence of an overt object.

(3) a. She wrote (letters) for an hour.

   b. She wrote two letters in half an hour.

   c. She ate (porridge/peanuts) for five minutes.

   d. She ate the porridge/a pack of peanuts in five minutes.

Like bare NP objects, the phantom objects under discussion are nonspecific.

   In the early days of generative grammar the intransitive version of these verbs was derived by a transformation deleting the object. Today it is generally thought that the objects of the verbs concerned in this alternation, though appearing in the lexicon, need not be projected in the syntax.[4]

   Thus an influential paper by Grimshaw (1993) draws a distinction between structural and content components of meaning. The objects of change-of-state verbs are structural, and must be projected; the objects of activity verbs are content arguments, and are in principle optional (subject to certain ill-understood restrictions). The reason is that change-of-state verbs have a complex event structure involving something like *x cause y to change state*, where *y* represents the object, whereas activity verbs have a simple structure: *x act*. Additional components of meaning that distinguish between different verbs in each structure are content components in this theory.

   Grimshaw and many subsequent authors regard occurrences of at least some of the verbs in (2) as capable of entering into a complex event structure in telic contexts; in particular, verbs of creation would have the structure (*x* cause *y* to come into existence), whereas the atelic version is always an

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[4] Cross-linguistic evidence, especially from ergative languages, is equivocal on this point. Many ergative languages apparently use the absolutive or nominative for objectless uses (Beth Levin, p.c. and Maria Bittner, p.c. for Greenlandic Eskimo), thus treating these verbs like ordinary intransitives. On the other hand, Basque uses the ergative case for the subject of *eat* in the simple present tense, whether there is an object or not (Larry Trask, p.c.); so, apparently, does Warlpiri (Levin 1983). Jespersen (1924: 158, no. 2) mentions the Somerset dialect of English (described by Elsworthy in 1911) in which the forms for intransitive *sing* and *dig* were *singi* and *digi* respectively; the form for the intransitive suggests the presence of an overt clitic. He mentions a similar distinction in Mauritius Creole, and the Magyar distinction *irok* ('subjective' conjugation) versus *irom* ('objective' conjugation) for 'I write'.

   In Mittwoch (1971) and (1982) I pointed out that the deleted element could not be the indefinite pronoun *something*, since this would be incompatible with the atelic nature of the resulting sentence. English and other languages known to me do not in fact have a pro-form that would match the required feature specification. The nearest is the pro-NP *things*, which will be discussed further in section 11.2.

   An explicit suggestion that some arguments need not be projected in the syntax was first put forward, to the best of my knowledge, in Rizzi (1982) in connection with a rather different set of data found in Italian. I shall discuss these in Section 11.2.

activity. Hence the objects in (3b and d) are structural, whereas the non-quantized objects in (3a and c) are content arguments, in Grimshaw's theory.[5]

Rappaport Hovav and Levin (1998) argue for a simplex event structure for these verbs even in their telic uses. They do not deny that verbs like *eat* and *read*—and apparently also verbs of creation—can be said to have two sub-events, but claim that they do so only 'conceptually'; syntactically, the sub-events are conflated by 'co-identification'. In support of this distinction they invoke a difference in temporal relation between the two classes of verbs; complex event verbs do not necessarily exhibit temporal dependence. Notoriously, an act of poisoning may be temporally distinct from the event of dying caused by it; by contrast, in simple-event structure verbs the sub-events are said to be temporally dependent. Furthermore, complex event verbs (lexical causatives) are subject to an Argument-Per-Sub-event condition which requires that there must be at least one distinct argument for each sub-event.

The temporal (in)dependence criterion seems—in view of technological devices like time switches—to be unstable, to say the least. I can record a television programme by presetting my video; perhaps in future I shall be able to attach my cleaning robot to a time-switch. Though the manner of the process will be very different from the way we conceptualize cleaning today, I would expect the 'name' to be extended to cover it. Even in the production of a cake, it is not altogether clear whether the activity of baking necessarily goes on until the cake is done. I therefore remain sceptical about the idea that object-taking verbs fall into just two distinct classes of simplex vs. complex events.

Distributional comparisons between simplex and complex event structure verbs focus on the fact that the link between verb and object is less constrained for the verbs in (2) than for change-of-state verbs, quite apart from the optionality of the object. Thus we get not only *sweep the table* but also *sweep the crumbs off the table*; similarly *mend the trousers* or *mend a hole in the trousers*. Change-of-state verbs like *break* do not display such elasticity in selection restrictions (though it should be added that many of the verbs in (2) do not display it either).

Many of the verbs can also take non-thematic complements in resultatives, as in (4) and in the *way* construction, as in (5):

(4)   a. He ate himself sick.

    b. He read his eyes sore.

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[5] Theories based on an aspectual projection rather than on lexical entries (e.g. Borer 1994; van Hout 2000*b*) treat objects in atelic structures (at least for non-stative verbs) as in principle optional; in telic structures, by contrast, the object is said to be obligatory.

    c. He knitted his fingers stiff.

    d. ?He cooked the freezer full.

(5)   a. He knitted his way through five balls of wool.

    b. We drank our way through a magnum bottle of whisky.

11.1.2 *Context*

The minimal context in which we find intransitive occurrences of the verbs in (2) is something like this. We point to a man or to a picture of a man and ask the question in (a), where (b) could provide appropriate answers:

(6)   a. What is he doing?

    b. He is reading / cooking / knitting / drawing / eating.

  Similarly the question–answer pair in (7)

(7)   a. What did you do after dinner last night?

    b. I read / knitted / cooked.

In these contexts the verbs denote 'activities' not only in the aspectual sense of this term but in the literal sense: they can be used to describe what a person is engaged or occupied in doing at a particular moment or interval, just like verbs such as *work* and *rest* that do not take objects at all. For want of a better term I shall employ [ACTIVITY] for this use.

11.1.3 *Chopping and polishing*

I now turn to two verbs that are included in a list of verbs under the heading of 'unspecified object alternation' in Levin (1993), but which do not meet the [ACTIVITY] criterion and have therefore not been included in (2) above. In the minimal context (8) would not be an acceptable answer:

(8)   He is polishing / chopping.

The indefinite pronoun *something* would be required by default.

  In a more restricted context, (8) would be passable, for instance if the common background includes household chores like cleaning and cooking. But even in such contexts there is, I think, a feeling of ellipticality and/or coercion about this usage.

  Polishing is a kind of cleaning or something very similar, and it seems to have a strong manner component. It allows the light verb + zero derived nominal construction: *give it a polish* like *give it a clean*. Like *clean* it allows the same sentence to be telic or atelic:

(9)   He polished the iron railing for / in an hour.

And it is not contradictory to say *He polished the silver but it's not shiny.* *Polish* also seems to permit resultatives and non-thematic objects:

(10)   a. He polished the cloth to shreds.

         b. He polished the shine back into my shoes.

And though one can polish a variety of different things, such as metal/shoes/floors, one might have expected the last of these to give rise to an intransitive [ACTIVITY] use for a kind of housework.[6]

The same goes for *chop*, since one of the noun classes for which this verb selects is vegetables and herbs. *Chop* shares most of the properties listed above, though *give it another chop* sounds marginal. Corresponding to (10a) we get *He chopped the knife blunt.*

11.1.4 The case of build

Build is a verb of creation, and moreover one that selects for a specific range of object nouns (unlike *make, create, produce, manufacture*). Yet (11) is odd as an answer to (6a).

(11)   ??He is building.

Insofar as (11) is acceptable, it suggests playing with a Lego set, a fairly homogeneous activity, rather than digging foundations, laying real bricks, etc. (But note that *After supper the child built* is impossible.) Could the trouble with (11) be that building involves too many different activities? Yet so does *cook*, which subsumes chopping, stirring, frying, etc. A difference that might be significant is that the time-span involved in building something tends to be much longer than that involved in preparing a dish or a meal.

In the examples considered so far, the verbs on their own, i.e. without adjuncts as well as without objects, have enough 'body', enough informational content to be able to fill the predicate slot. The addition of an adjunct can sometimes rescue a sentence that is bad without it. *Build* can occur without an object in the context of an adjunct of location:

(12)   John is building on the empty lot at the bottom of the road.

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[6] Levin also includes *polish* under '*butter*' verbs, i.e. verbs that denote the spreading of the substance denoted by the cognate noun onto a surface. This seems wrong for two reasons: unlike the case of *butter*, where the verb is derived from the noun, the noun *polish* is derived from the verb. Furthermore, the use of a substance is not an essential part of the meaning of the verb *polish*.

But in (12) build is not an [ACTIVITY]; it cannot serve as an answer to (6a). It involves an action spread over a much wider time-span than the examples above, and it may well be a statement about the place involved rather than about John. In fact, the person denoted by the subject of *build* does not have to participate in physical labour her/himself. One can say (12) about John while he is far away from the place concerned.

11.1.5 *Transfer of possession verbs*

Verbs other than process verbs cannot drop unspecified objects in episodic sentences in English, even in colloquial usage. Consider verbs denoting change of possession:

(13)   a. A. I deal in antiques as a sideline.

            B. Have you bought / sold *(anything) recently?

        b. Last week she sold *(something) to / bought *(something) from a rich Japanese collector.

        c. Did you buy *(anything)? (*said to someone coming from a shop*)

(14)   *I have to go down the road to post/mail.

These data are expected assuming, as seems reasonable, that these verbs are causative. Again, for some verbs extra context can rescue a sentence;

(15)   a. ??Last week John was called to the headmaster because he stole.

        b. Last week John stole from a teacher.

        c. John had stolen once before.

11.1.6 *Indirect objects*

Indirect objects denoting recipients are not omissible:

(16)   I gave it / lent it / promised it / bequeathed it *(to somebody).

The most notable exception to this rule is *sell* as in

(17)   I sold it (to somebody).[7]

11.2 Unspecified arguments in habitual sentences

I shall use the term 'habitual' rather freely to include restricted habituals in the progressive (e.g. *He is reading the Iliad at the moment*, said about somebody

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[7] Note also the adjectival passive construction *The book is sold* vs. *The book is lent*, and the middle construction *This book sells* versus *This book lends*. Presumably these data are connected. Apart from *sell*, *rent* allows the object to be dropped, and occurs in the adjectival passive and the middle construction (*This flat rents easily*).

who is asleep), iterative, and generic uses, as well as additional uses that will be explained below.

The verbs in (2) can occur freely without further modifiers in habitual sentences, though sometimes the meaning is somewhat different. Whereas episodic *He is writing* in the context of (6) denotes making marks with a pen, chalk, etc., the same sentence as a restricted habitual or the non-progressive sentence *He writes* could equally be used for working on a typewriter or computer, or even dictating into a tape recorder. Intransitive *drink* has a habitual use in which the understood object is restricted to an alcoholic beverage, as well as a use in which it is not thus restricted.

In habitual sentences we find, in addition, a much larger range of verbs that permit unspecified direct objects to be dropped, including many that are not process verbs.

11.2.1 *Dispositional properties and professions*

There are a few well-known cases, such as certain verbs that can denote dispositional properties:

(18)   a. Fido bites.

        b. The wool scratches.

(19)   a. Your knife cuts well.

        b. This gadget peels, shreds, and chops.

There are also a few verbs denoting capabilities:

(20)   He can't add / spell.

In the right context, verbs on their own can also denote professional activities. Normally a person's profession or hobby is expressed by an agent noun in English, so that even many of the verbs listed in (2) above are not in idiomatic use for this purpose. (Q. *What does he do for a living?* A. ?*He weaves / prints.*) In the right context, however, such sentences gain in acceptability, and many other verbs with specialized profession-denoting uses can drop their objects. The sentences in (21) are acceptable against a background discourse involving the bracketed elements:

(21)   She directs (films), produces (films), conducts (music), dyes (textiles), programmes (computers).

In such examples, the content of the missing object is supplied either anaphorically by previous discourse or by the extra-linguistic situation.

A somewhat different case is illustrated by (22), said of a construction company:

(22)   They build.

(22) is facilitated by the fact that the noun *builder* is pre-empted by a somewhat different profession, and *construction* in the relevant sense does not have a corresponding verb or agent noun.

11.2.2 *Missing people*

Rizzi (1986) draws attention to the examples in (23):

(23)   a. This leads (people) to the following conclusion.
        b. This sign cautions (people) against avalanches.
        c. John is always ready to please (people).

Rizzi accounts for the objectless uses of the verbs in (23) by postulating a lexically governed rule that allows the direct θ-role (of verbs subject to the rule) to be saturated in the lexicon rather than being projected in the syntax. The θ-role is assigned *arb* (arbitrary interpretation), i.e. [+HUMAN, +GENERIC, PLURAL]. In Italian, by contrast *arb* can be projected as *pro* and be syntactically active. It can be antecedent for PRO, as in (24), and be modified by secondary predicates, as in (25), subject to a restriction to the effect that these predicates have to be plural:

(24)   Questo conduce——   a PRO concludere quanto segue.
        This leads people   to conclude what follows.

(25)   a. Di solito, Gianni fotografa——seduti.
            In general Gianni photographs people seated.
        b. L'ambizione spesso spinge——commettere errori.
            Ambition often pushes people to make mistakes.

Rizzi notes that sentences with *arb pro* in object position have to be generic.

11.2.3 *Missing things*

Rizzi did not discuss cases where what is missing is inanimate. Such cases are by no means uncommon in English. Apart from the examples listed in 11.2.1 we find the following:

(26)   Online shopping was supposed to revolutionize the way we buy.

(27)   a. In Mediterranean countries they generally build on the hilltops.

     b. Round here they build quickly / inefficiently.

     c. In the past they built only in stone.

In (26) the understood object is whatever can be bought. (27b, c) demonstrate that habitual *build* tolerates a wider range of adverbials than episodic *build*; *John built in stone* on an episodic reading would be tolerable only if the referent of the missing object were contextually understood as a specific building or buildings.

    As noted above, *build* is a verb which in its basic sense selects for an object with a lexically well-defined type of head noun. Non-basic senses of *build* hardly allow object-dropping even in habitual sentences. Thus even in a context in which the building of models is at issue, one would not, I think, say:

(28)   ? Nowadays everybody builds on the computer.

Usually, retrieval of the content of the missing object requires rather more contextual information. In (29a) it depends on what the shop sells; in (29c) it is the lexical content of the subject noun that provides the clue to what it is that is being lent.

(29)   a. I usually buy in that shop.

     b. We sell only to wholesalers.

     c. Does the library lend to non-members?

The same applies to most of the examples in (30), which involve missing indirect objects, and (31), which involve missing direct and indirect objects:

(30)   a. I never give Christmas presents.

     b. We don't lend periodicals.

     c. They offer free trips to Paris.

     d. Do they allow travel expenses?.

(31)   a. They deliver (*said of a shop*).

     b. We don't rent for less than a week.

     c. We sell only for cash.

Some further examples are given below:

(32)   When he hits he hits hard.

(33)   She doesn't spend on herself.

(34)   Jackie cuts well (*said of a hairdresser or tailor*).

(35)   Psychiatrists certify as a last resort.

(36)   What do colleges do for this kind of money? They certify.[8]

(37)   As a boy he often stole.

(38)   We export to three continents.

(39)   She cleans and polishes all day.

Since habitual sentences are (like atelic base sentences) imperfective, the quantificational characteristics of the understood objects are the same as those discussed in Section 11.1, i.e. [−DELIMITED QUANTITY], and like these they are interpreted as nonspecific. This fact in itself goes a long way in explaining why missing objects are so much more easily tolerated in habitual sentences. By their nature such sentences generalize over an unlimited number of situations, and therefore, in our case, also over an unlimited number of instantiations of the denotee of the missing object. e.g. houses or villages for (27), people for (35). It is therefore natural that the missing object should be understood as a bare plural. Note that there are verbs that favour plural event readings; not unexpectedly, these permit object drop more easily than verbs similar in meaning that do not:

(40)   a.   This factory manufactures for export.

b.   ?This factory produces for export.

(41)   a.   They pilfer / loot / plunder.

b.   *They filch / swipe / snitch.

English in fact has pro-forms for bare plurals: unstressed *things*, and for humans, unstressed *people*. (This is mentioned in Bresnan (1971), Bolinger (1983), Erteschik-Shir (1997); it is a curious fact that traditional and even modern descriptive grammarians and dictionaries show no awareness of it.) If *people* is present in Rizzi's examples in (23), it is unstressed. Similarly, (42) as an alternative to (35), and (43), with *things*, as an alternative to (29a):

(42)   Psychiatrists certify people as a last resort.[9]

(43)   I often buy things in that shop.

There is a subtle difference, however: *things*, unlike a missing object, has the potential for introducing a discourse referent:

(44)   a.   He often buys things here and sells them there.

b.   *He often buys here and sells them there.

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[8] From a newspaper article on the high cost of college education in America.

[9] As an alternative to *people*, English also has the forms *one* and *you*.

This contrast corresponds to Koenig and Mauner's (2000) distinction between indefinites and 'a-definites'.[10] It should also be added that overt *things* would not be idiomatic in all of the examples above.

In the following examples some of these verbs occur in a use that is not actually habitual or iterative, but shares with these uses the property of event plurality; following Lasersohn (1995) I shall adopt 'pluractionality' as a cover term for event plurality.[11] Pluractionality can manifest itself in conjoint sentences, as in (45), where object drop in the whole is more natural than in the parts:

(45) a. They murdered, raped, and plundered.

b. [International tribunals] are valuable, she argues, because when they punish criminals, they also affirm, condemn, purge, and purify.

Pluractionality, according to Lasersohn, also covers intensity and long duration of the process involved in an event. Hence this term might well apply to the resultative and 'way' construction that we encountered in section 11.1, especially the *polish* examples in (10), repeated below as (46), as well as the examples in (47) and (48):

(46) a. He polished the cloth to shreds.

b. He polished the shine back into my shoes.

(47) a. They built the whole area into one sprawling conurbation.

b. We bought the shop empty (on resultative reading).[12]

(48) a. The Romans built their way through most of Europe.

b. We can't continue to build our way out of congestion.[13]

c. She spent her way through a fortune.

d. She borrowed her way through most of my library.

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[10] The distinction drawn by Koenig and Mauner is exemplified by an agentive passive with *somebody* as agent vs. a short passive, and by French *quelqu'un* vs. *on*.

Unstressed *things*, a pro-NP, differs from *something*, a pro-DP. Though *something* is also typically unstressed, it can bear stress, as in You **must** eat **something**. *Things* can only be stressed if it is contrasted with *people*. And it cannot follow the particle in a phrasal verb: *look up something* / *things the dictionary*.

[11] The term 'pluractionality' originally appears in the descriptive literature for morphological markings for event plurality in a number of disparate languages. Lasersohn attributes it to Paul Newman.

[12] But not *We sold the shop empty* on a resultative reading. The reason for this difference is that it is the buyer who takes the goods out of the shop.

[13] I am grateful to Beth Levin for providing (b), an attested example uttered by a federal highway administrator.

Of particular interest in this connection is the productive process of *out*V formation, where the resulting form selects for an object that belongs to the same class as the subject (see also Rappaport Hovav and Levin, this volume). Not surprisingly, in view of the competitive component in their meaning, *out*V verbs are particular popularly in commercial contexts. The examples in (49) were all found on the web:

(49) a. I don't think they can outbuild us.

  b. The US navy has outbuilt the Soviet navy.[14]

  c. Women outshop and outbuy men on the internet in Japan.

  d. With current spending power US Hispanics can already outbuy the biggest Latin American countries.

  e. How an accounting professional can outsell all but the absolute top sales experts.

  f. Missouri farmers may outproduce neighbors.

  g. in order to outdeliver and outinvent the competition.

  h. A successful businessman has to out-think, out-invent, and out-market the competition.

  i. Average dishwashing liquids outclean antibacterial soaps.[15]

11.2.4 *Habituals and information structure*

For many of the examples above I would like to suggest an additional reason facilitating the omissibility of the object. Semantically, habitual sentences involve a binary operator that binds one or more variables appearing in the restrictor and matrix; other variables may appear free in the matrix, in which case they get bound by existential closure, as shown schematically in (50):

(50) $Gen_{s,x}$ (Restrictor [. . . s,x . . .]) $\exists y$(Matrix [. . . s,x,y . . .]

  where s is a situation variable. (Krifka et al. 1995)

It has been observed that the backgrounded, presupposed material of a habitual sentence (or one that is represented with another binary quantifier) appears in the restrictor, whereas the focused part is in the matrix (Partee 1991; Krifka et al. 1995 and references cited there). In many of my examples, on their

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[14] Note that in (49b) the phantom object is understood as ships, which would hardly be possible in the case of my previous examples with *build*.

[15] Note that on an episodic reading of *They are cleaning* the subject pronoun could not refer to cleaning agents.

most natural readings, the omitted object together with the verb belongs to the restrictor. Thus (27a) with normal intonation has the representation (51):

(51)   ... $Gen_{s,x}$ [they build x **in** s] [on hilltop x **in** s]

and would be natural in a discourse in which the building of houses or villages and their location is at issue. To verify (27a) one would typically look to see where the houses or villages are, rather than what there is on the hilltops.[16]

Similarly, (29a) would most naturally have the representation in (52):

(52)   Often $_{s,x}$ [I buy x in s] [I buy x in that shop in s].

When a habitual sentence can be contextualized so that verb and object represent backgrounded information, object drop is facilitated. Thus, although verbs of destruction are very unlikely candidates for object drop, in a context where the demolition of houses or the felling of trees is the topic of conversation, (53a, b) is just about tolerable:

(53)   a. They usually demolish rather than restore.

          b. They fell indiscriminately.

The information may also be backgrounded by the extra-linguistic context, as in the following notice once displayed in a London pharmacy:

(54)   We dispense with accuracy.[17]

Thus also we find minimal pairs where missing objects are construed as definite in episodic sentences (cf. n. 1) but can be construed as unspecified in habitual sentences:

(55)   a. They attacked at night (*non-iterative*).

          b. They usually attack at night.

(56)   a. Mary won / passed.

          b. Mary always wins / passes.

---

[16] The reading given in (51) for (27a) can be overridden by contrastive focus. If the topic of the conversation is hilltops, (27a) can be uttered with main stress on *build*, and have the representation in (i):

i) ... Gen $_{s,y}$ [hilltop y] $\exists x$[they build x on y **in** s]

(i) has the missing object outside the restrictor. It would be appropriate in a context where what is at issue is how hilltops are used in different areas, with a set of alternatives including, e.g., leaving them bare or landscaping them. It could be a response to either a question, *What do they do with hilltops?*, or a previous utterance, e.g. *Here hilltops are generally left for recreation.*

[17] Thanks to Bernard Springer for spotting this example.

(57)   a. You missed.

       b. Robin Hood never misses.

(55a) refers to an attack on a specific contextually given group of people, (56a) to a particular game or examination, and (57a) to a particular target. This is not necessarily so for the (b) sentences. (55b) can mean that whoever they attack is attacked at night. (56b) means that whenever Mary is involved in a game or an examination, she wins the game or passes the exam. (57b), due to Schubert and Pelletier (1987), says that when Robin Hood shoots at a target he does not miss it.

The assumption that missing objects in habitual sentences are typically backgrounded also accounts for Rizzi's Italian data cited in (25), repeated here:

(58)   a. Di solito,   Gianni   fotografa——   seduti.

          In general   Gianni   photographs people   seated.

       b. L'ambizione spesso   spinge——commettere   errori.

          Ambition   often   pushes people   to make   mistakes.

It seems clear that (58a) makes a statement not about what Gianni does in general but rather about how he photographs people. Its representation would thus be as in (59):

(59)   Generally $_{s,x}$ (G. photographs x in s) (G photographs x seated in s)

Similarly (58b) means that when a person is ambitious, ambition often pushes her to make mistakes.

I take it as confirmation for the above explanation in terms of backgrounding that Goldberg (this volume) comes to a very similar conclusion: See section 10.6, 'Omission under Low Discourse Prominence'.

11.2.5 *Contrastive contexts*

The most permissive contexts for object drop involve pairs of verbs that stand in some sort of semantic contrast. Some speakers appear to have an anaphoric process whereby in a sequence of clauses in which contrasting verbs share a bare NP object, the object is dropped in the second clause; both clauses have contrastive focus:

(60)   Those who give bribes are just as guilty as those who take. (*Herald Tribune*, 23 Sept. 1998)

The most typical examples for object drop (and more acceptable than (60)) are those in which there is parallelism, with both clauses lacking the objects:

(61)   a. He only breaks, he never fixes.

      b. They planted, he uprooted.

      c. He always tears, he never cuts.

      d. Some people cut, others tear.

      e. She describes, but doesn't explain.

      f. Man proposes, God disposes.

      g. A few people bought, most just looked.

      h. You only take, you never give.

It is noteworthy that in such contexts we find even some of the poorest candidates for object drop; *break* is a prototypical change-of-state verb. (Cf. Rappaport Hovav and Levin, this volume, for the normal constraint on object expression with such verbs.) Even verbs that have no manner content whatsoever can form such a pair:

(62)   This one creates, that one destroys.[18]

In such sentences one clause alone (i.e. without the contrastive clause) would normally be hard to contextualize. What we do find, however, is single-clause examples where the contrast is extra-linguistic. If I see someone cutting an article out of a newspaper, I may say *I always tear*, with contrastive stress on the verb.

Object drop in these cases is clearly a rhetorical device: the absence of the object has the effect of adding weight to the verb. The verbs, as it were, prop each other up. Just as de-stressing an element increases the phonological prominence of what is stressed, omission, a further step, increases the prominence of what remains. What is left does not have to share the hearer's attention with what is omitted.

Here too the missing objects are backgrounded; if present, they would be in the restrictor. (61a and d) could be very roughly paraphrased as:

(63)   a. His relationship to things (e.g. household objects) is breaking them rather than fixing them.

      b. In a situation that involves separating a part from a piece of paper or cloth, some people tear it, others cut it. (*it* = either the paper or the piece separated)

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[18] *Make* is too lightweight to be able to replace *create* in (62).

11.2.6 *Where to look for missing things and people*

If the explanation put forward in 11.2.4 and 11.2.5 for missing objects in contexts where their content is backgrounded is along the right lines, it suggests that in such contexts there is after all a phonologically null proform in the syntax. It is well known that backgrounded material, including for example personal pronouns, tends to be de-stressed, thus increasing the prominence of what is stressed. There is an observation, usually attributed to Halliday, to the effect that omission is the ultimate de-stressing: it makes no demands whatsoever on the hearer's attention. The null proform I am suggesting would be a step further informationally than the items *things* and *people* discussed above: a phonologically null pro-NP with the features [+PLURAL, ± HUMAN]. It would be distinct from the object-*pro* postulated for Italian in Rizzi (1986).[19] In view of contrastive examples like (61) and (62), the alternative to this suggestion would be that in the right context almost all verbs would permit their object arguments to be saturated in the lexicon rather than in the syntax. Note that empty pro-NPs interpreted as plurals are found in the grammar elsewhere, namely inside DPs, as in *the poor*, *the French* (only [+HUMAN]); perhaps also in *these* and *those* ([± HUMAN]), as in *I prefer these*, on the assumption that the overt material is in Det.

Needless to say, the other option, according to which the normal object of these verbs (i.e. the one associated with their selection restrictions) is absent altogether in the syntax, would still be required for those constructions in which the object position is occupied by non-thematic material, i.e. resultatives, the *way* construction and the *out*V construction. It may also be the preferable option for the many examples for which there is no reason to suppose that the missing material appears in the restrictor.

11.2.7 *Nominalizations*

Not surprisingly, object-dropping also occurs with nominalizations used habitually. Grimshaw (1990), following Lebeaux (1986), states that, for what

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[19] Though English does not have a productive construction analogous to (58), it does in fact have two marginal constructions in which the missing object seems to be syntactically active.

(i) Buy cheap, sell dear.

In (i), which is idiomatic, the secondary predicates are depictive; it differs from the Italian construction only in the fact that the missing object is [−HUMAN]. In (ii) the adjectives are predicated of the product of the action denoted by the verb:

(ii) a. These architects build high.

    b. This coffee mill grinds very fine.

    c. Though the mills of God grind slowly, yet they/grind exceeding small' [H. W. Longfellow, 'Retribution', 1870]

    d. ?? He writes very small.

The missing material here is probably not a pro-NP but a pro-form for a higher projection.

she calls complex event nouns, the internal argument position is obligatory, just as for the corresponding verbs:

(64)   a.   the felling *(of the trees)

     b.   *The testing took a long time.

These examples with the definite article preceding the nominalization suggest episodic readings of the nominalized verbs. In a context that assigns the noun a habitual reading, such arguments can be dropped:

(65)   a.   Indiscriminate felling is harmful to the environment.

     b.   Frequent testing ensures that the material assigned is read.

Although Grimshaw's discussion on the properties of the determiner system of complex event nominals is somewhat inconclusive, her account strongly suggests that these nominals are in fact basically non-count: they do not normally allow either plural morphology or an indefinite determiner. Non-count nouns have mereological affinities both with bare plurals and with imperfective aspect; as is well known, habituals are imperfective. I speculate that a habitual reading of such nominalizations is not derived, as for the underlying verb, but basic.[20]

11.3 Conclusion

The transitivity alternations involving unspecified objects as discussed in this chapter clearly represent a range of constructions, most of which are sensitive to context. At one end we find what I have called [ACTIVITY] verbs like *eat* and *clean*, in the minimal context given in section 11.1.2, which have the feel of unergatives. Next come verbs like *chop* and *polish*, which require a narrower extra-linguistic or extra-sentential context to permit object drop, and verbs that require further intra-sentential material, in particular various adjuncts, for this purpose. I have shown that in pluractional contexts objects are more easily dispensable, and suggested that this is due to the fact that the objects in such contexts are in any case interpreted as unquantized. I have suggested, further, that where the missing objects would be contextually backgrounded, they are represented as phonologically null pro-NPs.

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[20] This conclusion is reached independently in Engelhardt (2000).

12

Resultatives Under the 'Event-Argument Homomorphism' Model of Telicity

STEPHEN WECHSLER

This chapter presents a novel semantic analysis of the English resultative construction that crucially models telicity (aspectual boundedness) in terms of the event–argument homomorphism model (e.g. Krifka 1998) rather than the commonly assumed result state model (Dowty 1979). This assumption, together with recent insights on the semantics of scalar adjectives (Hay et al. 1999; Kennedy 1999; Kennedy and McNally 1999), leads us to an explanation for a myriad of facts. Corpus data from Boas (2000) strongly support our conclusions.

The central idea of this analysis is that resultatives involve an abstract 'path' argument corresponding to degrees along the scale denoted by the resultative predicate. This approach is broadly consonant with conclusions reached independently in other recent work. This independent evidence includes the cross-linguistic parallels between resultatives and locative paths observed by Beck and Snyder (2001); Vanden Wyngaerd's (2001) observations on Dutch and English; and Beavers' (2002) formal analysis of resultative PPs. However, comparison with those works will not be undertaken here.

12.1 Introduction

English resultatives are secondary predicates indicating the result of the action described by the primary predicate. The predicate *flat* in sentence (1) is a resultative because the sentence entails that the metal became flat as a result of the hammering. (In contrast, depictives like *The chairman came to the meeting drunk* don't entail a result. This chapter does not deal with depictives).

(1)   Resultative (predicate in italics; its subject underlined):

John hammered <u>the metal</u> *flat.*

⇒'John hammered the metal; as a result, the metal became flat.'

(2)   Depictive:

The chairman came to the meeting *drunk.*

'The chairman was drunk when he came to the meeting.'

There are three types of observation to be addressed.

Observation 1. Massive lexical variation
First, there is massive variation in acceptability depending on the particular words appearing in the construction.

(3)   a.   wipe <u>the table</u> *clean / dry / *dirty / *wet*

b.   hammer <u>the metal</u> *flat/ smooth/ into the ground / *beautiful/ *safe/ *tubular*

c.   <u>The puddle</u> froze *solid/ *slippery/ *dangerous*

Some examples sound bad even where the meaning is clear and paraphrasable as above: 'Mary wiped the table; as a result the table became wet' makes perfect sense, but it is still odd to say *Mary wiped the table wet,* while 'Mary wiped the table dry' is fine (see 3a). As we shall see, corpus data strongly support these judgements.

While many researchers have noted this variation, to my knowledge no one has yet offered an explanation for the particular contrasts found. The following quote is typical:

Research on this problem (Green, 1972) has uncovered no general principle which predicts this difference in acceptability, and I take this as a good indication that this construction is a kind of lexicalized compound verb, though one which typically appears as a discontinuous constituent. (Dowty 1979: 303)

Indeed, the observed contrasts would seem to defy any conceivable logic. Nevertheless, an explanation will be offered below, based on a crucial semantic difference between adjectives like *wet/ dirty* versus *dry/ clean* (see 3a).

Observation 2. AP vs. PP resultatives
Similarly, the distribution of PP versus AP resultatives, as in (4), has often been noted but has never yielded to analysis or explanation.

(4)   a.   The rabbits had apparently been battered {*dead/ to death }.

b.   He and a confederate shot the miller {dead/ to death}.

Boas (2000: 261–2) concludes, for example, that 'The distribution of *dead* versus *to death* clearly shows that particular types of verbs are conventionally associated with specific types of resultative phrases.'

Observation 3. The putative Direct Object Restriction (DOR)

A further claim is that the resultative predicate must be predicated of a 'deep' object (see e.g. Levin and Rappaport-Hovav 1995; Simpson 1983). Unlike the first two observations, for which the explanation, if any, might be expected to be semantic in nature, the third observation concerns syntax instead—or so it is claimed. Since Simpson's groundbreaking 1983 paper, it has been claimed that a resultative predicate must be predicated of a 'deep object': the object of a transitive (5a), or the subject of an unaccusative (5b), but not the subject of an unergative (5c). Most strikingly, the latter example can be saved by inserting a so-called 'fake reflexive' (5d), apparently dooming any possibility of a semantic account, and instead suggesting a structural, syntactic requirement, the Direct Object Restriction or DOR. However, I will argue that the explanation turns out to be semantic after all.

(5) a. John hammered <u>the metal</u> *flat.*   (transitive)

  b. <u>The water</u> froze *solid.*   (unaccusative)

  c. *<u>The dog</u> barked *hoarse.*   (*unergative)

  d. The dog barked <u>itself</u> *hoarse.*   ('fake reflexive')

What is going on in (5d)? Since this will play an important role later on, let us look at it in more detail. (5d) is an example of an Exceptional Case-Marking (ECM) resultative (cf. Subject-to-Object Raising). Resultatives fall into two classes, exactly analogous to Control constructions (*John persuaded Mary to sing*) and ECM constructions (*John expected Mary to sing*), respectively. In the former type the predication subject for the secondary predicate is a semantic argument of the verb, while in the latter it is not. For example, in *wipe the table clean*, 'the table' is a semantic argument of 'wipe', while in *Mary ran the soles off her shoes*, 'the soles' is not an argument of 'run', as shown by the fact that it fails to entail that *Mary ran the soles*.

(6) Two types of resultative (Dowty 1979; Carrier and Randall 1992; Simpson 1983):

Type 1: Control resultative: resultative phrase whose predication subject is a semantic argument of the matrix verb.

  He wiped <u>the table</u> *clean.* $\Rightarrow$ He wiped the table.

  <u>The water</u> froze *solid.* $\Rightarrow$ The water froze.

Type 2: ECM (‘exceptional case-marking’) resultative: resultative phrase whose predication subject is *not* a semantic argument of the matrix verb.

The dog barked <u>itself</u> *hoarse.* $\not\Rightarrow$ *The dog barked itself.

Mary ran <u>the soles</u> *off her shoes.* $\not\Rightarrow$ *Mary ran the soles.

Simpson argued for the DOR on the basis of the data in (7), which are similar to (5): as he pointed out, ‘sick’ and ‘tired’ cannot be predicated of the underlying subjects in (7a) and (7b).

(7)   Simpson 1983 argued for DOR:

    a.   *<u>I</u> ate the food *sick.* (p. 144)

    b.   *<u>I</u> danced/ laughed/ jogged/ walked/ worked *tired.* (ex. 15, p. 145)

    c.   I ate <u>myself</u> *sick.* (ex. 20b, p. 145)

    d.   I danced <u>myself</u> *tired.* (ex. 17, p. 145)

But a look at further data suggests that there is something wrong with this story. Foreshadowing the discussion below, it turns out that *sick* and *tired* cannot be resultative predicates on *any* semantic arguments, whether subject or object, as illustrated in (8):

(8)   a.   *I fed <u>the cat</u> *sick.*

    b.   *The coach trained <u>us</u> *tired.*

Conversely, as we shall see later, some adjectives actually can be predicated of an underlying subject, as long as the semantic conditions are right. The real division underlying the contrast between (7a, b) and (7c, d) is not between deep subject and deep object, but between argument and non-argument.

    The goal of this chapter is to explain all three observations above on the basis of a single, unified line of reasoning.

12.2 The origins of telicity

If there is any aspect of resultatives that is completely uncontroversial, it is that they are telic: they describe events with a definite end-point. In the Vendler classification, we would say that they are accomplishments or achievements. This is illustrated by the standard tests in (9) and (10). The perfective entailment follows for the atelic sentence *John hammered the metal*, but the addition of the resultative renders the sentence telic, so the entailment no longer follows: *John is hammering the metal flat* does not entail that *John hammered the metal flat.* The time adverbial facts in (c) and (d) confirm this. (10) shows similar facts for an ECM resultative, although, as we shall see later, not all ECM

resultatives are really telic. But the constraint applies very strongly to Control resultatives.

(9)   a. John is hammering the metal.

           ⇒ John has hammered the metal. (atelic)

       b. John is hammering the metal flat.

           ⇏ John has hammered the metal flat. (telic)

       c. John hammered the metal (for an hour / *in an hour).

       d. John hammered the metal flat (*for an hour / in an hour).

(10)   a. John is drinking.

           ⇒ John has drunk. (atelic)

       b. John is drinking himself to death.

           ⇏ John has drunk himself to death. (telic)

       c. John drank (for an hour / *in an hour).

       d. John drank himself to death (*for a year / in a year).

Our starting premise is that telicity is a constructional feature of resultatives. It is a requirement placed on the output of the semantic composition of the sentence.

   The crucial issue is the mechanism by which telicity is generated. How exactly does it come about that the addition of a resultative secondary predicate makes a sentence telic?

   Most treatments of resultatives, going back at least to Dowty (1979), embrace the 'result state' model of telicity, according to which the end-point of an event is defined in terms of the attainment of a certain result state. Thus the logical decomposition of the sentence includes a representation of that result state. For example, in *Mary shakes John awake*, as analysed by Dowty, the result state is one in which John is awake.

(11)   a. Mary shakes John awake.

       b. [shake'(m,j) CAUSE BECOME awake'(j)]

Most previous aspectual treatments of resultatives embrace the result state model (e.g. Dowty 1979; Pustejovsky 1991; Rappaport-Hovav and Levin 1998; Rapoport 1999).

   Instead I will assume an alternative model, most elaborately developed in the work of Manfred Krifka (e.g. Krifka 1987; 1992; 1998; Tenny 1994; Jackendoff 1996; Ramchand 1997). (As we will see later, the result state model is not rejected entirely. It remains appropriate for some constructions, possibly even

for some ECM resultatives.) An event and a participant in that event are both modelled in terms of their mereology or part structure. Relationships between events and arguments can then be discerned. To take the classic example pointed out originally by H. J. Verkuyl, (12a) is atelic while (12b) is telic.

(12)   a. John drank wine (for an hour) / (*in an hour).

    b. John drank a glass of wine (*for an hour) / (in an hour).

This can be explained by the observation that parts of the wine-drinking event correspond to parts of the volume of wine. Because of this homomorphism between wine and wine-drinking, quantification is transferred from the nominal to the verbal domain. When the volume of wine is *quantized*, i.e. when it is a definite amount, such as *a glass of wine*, the event similarly becomes quantized, hence telic. When the volume of wine is *cumulative*, or indefinite, then the event is atelic.

Let us use the term 'affected theme' for the argument of the verb from which quantification can be transferred. Thus the affected theme for the verb *drink* is the 'drinkee' argument, instantiated by wine or a glass of wine in (12). In the case of the verb *drink*, the relevant property of this affected theme participant is its physical volume: the volume of wine remaining in the glass diminishes as the event unfolds, and when that volume equals zero the event ends. This property, volume in this particular case, normally must be scalar. The scale along which this property is measured will be called the property scale or path.[1]

In the case of *wine*, this property scale lacks any inherent bound, while in the case of *a glass of wine*, the bound is reached when the volume of wine in the glass reaches zero. Thus a telic event requires three things: an affected theme, a property scale, and a bound, related as follows (cf. Krifka 1998):

(13)   Some **property** of the **affected theme** argument changes by degrees along a **scale** due to the action described by the verb, until it reaches a **bound**.

There are two further requirements for telicity:

1. The telic event and the path must be (a) homomorphic (parts of the event must correspond to parts of the path and vice versa) and (b) coextensive (the event must begin when the affected theme is at the start of the path and end when the affected theme reaches the end of the path).
2. The affected theme must be an argument of the event-denoting predicate.

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[1] The notion of *path* has been analysed in many different ways. See Erteschik-Shir and Rapoport (this volume) for one recent approach.

Physical volume is only one of many possible property scales or paths that exhibit this sort of homomorphic relation to an event. More examples are shown in (14) (adapted from Hay et al. 1999):

(14)   *Example*   *Scale (X = affected theme argument)*

      drink a glass of wine   volume of X consumed

      eat a sandwich   volume of X consumed

      write a letter   amount of X in existence

      cool the soup   temperature of X

      dim the lights   brightness of X

      read a letter   amount of X that has been read

      walk to school   distance traversed by X

      hike the Ridge Trail   distance traversed by X

In each case the affected theme argument changes by degrees along a scale that is homomorphic to the event. In addition, a basic property of paths is that they are coextensive with the event: the event begins and ends where the path begins and ends, respectively. If the scale has a definite bound or end-point, then the event is telic.

The central proposal of this paper is simply that, in the case of resultatives, *the property scale is expressed by the resultative predicate.* This immediately leads to two predictions:

Prediction 1.   When the resultative's predication subject is an argument of the verb (i.e. in a control resultative), homomorphism and coextension between property scale and event are required.

Prediction 2.   When the resultative's predication subject is *not* an argument of the verb (i.e. in an ECM resultative), homomorphism and coextension between property scale and event are *not* required.

Prediction 1 is discussed in section 12.4; Prediction 2 is discussed in section 12.6.

12.3 Semantics of adjectives

Next we need to focus on the semantics of adjectives. There are two types: gradable adjectives, which accept degree modifiers and comparatives, such as *long, flat,* or *tall,* and non-gradable ones, which reject degree modifiers and

comparatives, like *dead, triangular,* or *invited* (cf. Klein 1980; McConnell-Ginet 1973).

(15)   a. Gradable adjectives:

very/ quite/ extremely {long/ flat/ expensive/ straight/ full/ dull}

longer, flatter, more expensive, straighter, fuller, duller

   b. Non-gradable adjectives:

??very/ quite/ extremely {dead/ triangular/ invited/ sold}

??more dead/ triangular/ invited/ sold

A gradable adjective is interpreted with respect to a *standard*. *Michael Jordan is tall* means that Jordan's height is greater than some contextually determined standard, for example with respect to basketball players, or people as a whole (e.g. Kennedy 1999).

   Some gradable adjectives, called 'closed-scale' adjectives, supply an inherent lexical standard that serves as a default. Consider *full, empty, straight,* and *dry.* When drying a towel there is a point at which it simply can get no dryer: the towel contains no water whatsoever. This maximum serves as the default standard, which applies when a contextually given standard does not pre-empt it. In contrast, 'open-scale' adjectives like *tall, long, wide, short,* and *cool* lack inherent maxima, and hence must rely on context for their standards (Kennedy and McNally 1999; Hay et al. 1999). One test for closed vs. open scale is the appropriateness of modifiers like *totally* or *completely*:[2]

(16)   a. completely full/ empty/ straight/ dry   (closed scale)

   b. ?? completely long/ wide/ short/ cool   (open scale)

In addition to the closed-scale adjectives with maximal end-points, there are also some closed-scale adjectives with minimal end-points, such as *wet* and *dirty.* Consider *dirty.* As you begin to move up the dirtiness scale from zero dirt, you immediately reach a positive value. Thus by the inherent standard, any amount of dirt, no matter how small, qualifies something as dirty. But unless the speaker is, for example, an unscrupulous landlord refusing to return

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[2] Kennedy and McNally (1999: n. 1) note that the *completely* test is complicated by the fact that *completely* sometimes appears with open-scale adjectives, with the meaning 'very'. They point out that entailments differ, making (i) but not (ii) contradictory:

 (i) #The line is completely straight, but it could be straighter.

(ii) I'm completely uninterested in finances, but Bob is even less interested.

Similarly, Rotstein and Winter (2001), who provide a formal account of such modification, note that *The red towel is completely dry and the green towel is completely dry* entails *Both towels are equally dry,* while *The red towel is completely wet and the green towel is completely wet* does not entail *Both towels are equally wet.*

a cleaning deposit on the basis of an infinitesimal grain of dirt in one room of an apartment, the minimal inherent standard is ignored and a more reasonable contextual standard normally prevails. Similarly, a towel with a few molecules of water does not normally qualify as *wet*. So these minimal end-point adjectives can be considered as de facto open-scale adjectives.

Minimal end-point adjectives pattern with open-scale adjectives rather than (maximal end-point) closed-scale adjectives with respect to an interesting property noted by Hay et al. (1999), who studied de-adjectival 'degree achievement' verbs like *straighten, flatten, and cool$_V$*.[3] They point out that this adjective-to-verb derivation yields a telic verb if the root adjective is closed-scale, while yielding an atelic verb if the root adjective is open-scale (or yielding a telic verb, if context supplies a bound). Hence *straight* is (maximal end-point) closed-scale, so *straighten* is telic; but *cool$_A$* is open-scale, so *cool$_V$* is atelic, as shown by the imperfective entailment test:

(17)   a. They are straightening the rope. $\not\Rightarrow$ They have straightened the rope.

       b. They are cooling the soup. $\Rightarrow$ They have cooled the soup.

Interestingly, a minimal end-point adjective such as *wet* patterns with open-scale rather than (maximal end-point) closed-scale adjectives:

(17)   c. John is wetting the towel. $\Rightarrow$ John has wetted the towel.

Summarizing, adjectives fall into two broad semantic classes, gradable and non-gradable. Gradable adjectives subdivide into closed-scale and open-scale adjectives. Closed-scale adjectives further divide into maximal end-point and minimal end-point adjectives. Because the end-point is infinitesimally low for minimal end-point adjectives, they behave in many respects as *de facto* open-scale adjectives. This typology of adjective types is summarized in Figure 12.1.
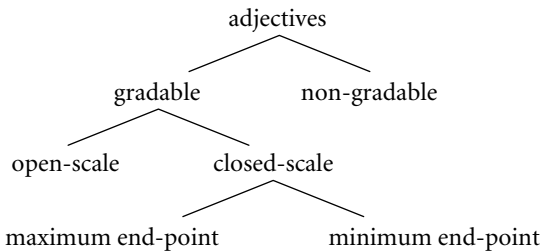
FIGURE 12.1 Typology of adjectives

[3] See also Erteschik-Shir and Rapoport (this volume) for discussion.

12.4 The scalar structure of resultative predicates

Returning now to resultatives: because of the homomorphism between the property scale and the event, the telicity of the event directly depends on the scalar structure of the adjective—that is, whether it is closed- or open-scale. And because of the coextension requirement, the duration of the event must be appropriate to the scale as well. Specifically, we will discuss three possible situations that are predicted to yield a telic sentence:

- Type I: The verb is durative (expresses an event that is extended in time); the resultative predicate is a gradable, maximal end-point closed-scale adjective.
- Type II. The verb is punctual; the resultative predicate is a non-gradable adjective.
- Type III. The resultative predicate is a path PP (*to* or *into*) whose object NP specifies the bound. (The verb is normally durative, unless the path is very short.)

12.4.1 *Type I: Verb is durative; resultative is a gradable, closed-scale adjective.*

Consider first a standard example:

(18)   Mary hammered the metal flat.

The verb *hammer* is durative, and the adjective *flat* is gradable and closed-scale (maximum end-point): there is a point at which metal becomes so flat that it can get no flatter. The telic bound on the event expressed by (18) is provided by the closed-scale maximal end-point adjective.

The graph in Figure 12.2 depicts a sample 'hammering-flat' scenario. Time is represented by the horizontal x-axis, while the flatness of the metal is plotted on the y-axis.
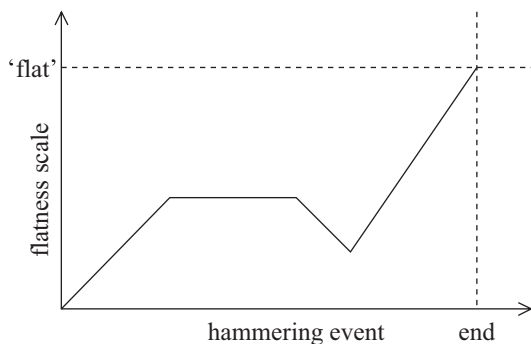
FIGURE 12.2 A sample 'hammering flat' event

As the event progresses, for a time the metal becomes flatter; then the hammer blows become ineffective and the relative flatness does not change; then the metal actually becomes less flat (perhaps one part of the metal springs up when the other part is hit); and finally it attains flatness, at which point the event ends. This illustrates the point that the mapping between time and the property scale is rather unconstrained. What is crucial is just that the property scale should have an inherent maximum which serves to provide an end-point for the event.

Now consider the following puzzling contrasts, noted by Green (1972: exx. 6b, 7b) but heretofore unexplained:[4]

(19)   He wiped it clean / dry / smooth / *damp / *dirty / *stained / *wet.

The adjectives *clean, dry,* and *smooth* are all maximal end-point closed-scale adjectives, which thus provide suitable bounds for the event. In contrast, the adjectives *damp, dirty, stained,* and *wet* are minimal end-point adjectives—what I have called '*de facto* open-scale adjectives'. Their inherent standards are too low to be useful, so contextual standards normally prevail. But inherent standards are needed in order to serve as suitable telic bounds. Since resultative constructions must be telic, these sentences fail.

Corpus data strongly support this contrast. Boas (2000) collected thousands of resultatives from the British National Corpus and other sources (COBUILD Bank of English, dictionaries, use-net groups, and websites). He found 77 examples using the resultative predicate *dry,* and none with *wet.* Of course we need to be cautious about drawing conclusions from comparisons of this kind, since it could be the case that people just write about drying things more often than wetting things. But the appearance of twelve *make*-causatives (e.g. *make my hair wet*) with the adjective *wet* clearly shows that the notion of making things wet was in fact expressed, but that the resultative construction was systematically avoided.[5] Following is the distribution of verbs appearing with *dry* in this corpus:

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[4] Goldberg's (1995: 195 ff.) 'end-of-scale constraint' on resultative adjectives, which I became aware of only after completing this work, broadly prefigures the present observations. However, it does not invoke the crucial typology of adjective semantics on which the present account relies. Goldberg claims that most of the adjectives allowed in the resultative construction are non-gradable—a claim which is inconsistent with our findings.

[5] Boas included examples with *make* and *get* (e.g. *make it dry and warm*) among his resultatives, but they are lexical causatives. They lack the entailments of resultatives: *John made his hair wet* entails neither that *John made his hair* (as would be expected for a control resultative) nor that *John made* (as would be expected for an ECM resultative). I also omit occasional misclassified examples.

(20)   Occurrences of resultative *dry*: 77, distributed among verbs as follows: *suck* (16 occurrences), *bleed* (7), *towel* (6), *wipe* (6), *rub* (6), *boil* (5), *pat* (5), *drink* (5), *milk* (3), *squeeze* (3), *hug* (2), *run* (2), *drain* (2), *blow*, *brush*, *cry*, *dab*, *drip*, *eat*, *scrub*, *weep* (1 each)

Example: 'The sun has obviously *boiled their brains dry*—"Elemental Forces" is a work of warped hippy ideals and punky ferocity that occasionally slips into a groove of plotted madness.'

(21)   Occurrences of resultative *wet*: none (12 *make*-causatives; see n. 5 above)

Similarly, the Boas corpus contains 102 occurrences of resultative *clean* and none of *dirty*, despite dirtying actions being expressed 33 times with *get*-causatives and 8 times with *make*-causatives.

(22)   *Clean*: 102 occurrences: *wipe* (41), *wash* (11), *sweep* (10), *scrub* (9), *rub* (6), *lick* (6), *scrape* (5), *rinse* (3), *suck* (3), *scour* (2), *pare* (2), *whip*, *wag*, *swab*, *polish*, *pick* (1 each)

(23)   *Dirty*: none (33 *get*-causatives, 8 *make*-causatives)

These corpus data strikingly confirm the facts reported by Green and others on the basis of introspective judgements.

12.4.2 *Type II: Verb is punctual; resultative is a non-gradable adjective.*

The second predicted type involves verbs in construction with the non-gradable AP resultative *dead*. Tragically, the Boas corpus includes many, many examples of victims being *shot dead, cut dead, killed dead*, and so on. The verbs almost always denote punctual events: *shoot, cut, kill*, etc.

(24)   *Dead*: 429 occurrences: *shoot* (408), *cut* (11), *kill* (9), *strike* (8), *stop* (6), *knock* (3), *flatten*, *kick*, *smite* (1 each)

Example: 'At another mill, the Fox mill, he and a confederate *shot the miller dead*, injured the miller's wife and maid, then made them fry some eggs in fat.'

The adjective *dead* is a standard example of a non-gradable adjective (example from Kennedy 1999: 41):

(25)   a. ??Nixon is extremely dead.

b. ??Nixon is more dead than Reagan.

Due to the requirement that the event and the change undergone by the affected theme be coextensive, the verb in a resultative construction with a non-gradable adjective must be punctual: *shoot the miller dead* vs. **bore the students dead*.

Figure 12.3 depicts a punctual event with non-gradable adjective. Since the transition between states is virtually instantaneous, the resulting graph is essentially a step-function. Hence the event itself must be conceptualized as non-durative or at least very short.

12.4.3 *Type III: Verb is durative, resultative is a path PP whose object NP specifies the bound.*

Contrast *dead* with the goal-PP *to death*. The resultative PP *to death* denotes a path whose end-point is death. More generally, and not just in the context of resultatives, to-PP paths can be long or short, hence appear with durative verbs (*walk to NP*) and punctual verbs (*give it to NP*). Thus *to death* works with either durative verbs (26a) or punctual verbs (26b), as in these corpus examples:

(26)   a.   The rabbits had apparently been battered {*dead / to death }.

      b.   He and a confederate shot the miller {dead / to death}.

Many of the verbs in the Boas corpus occurring with resultative *to death* are durative, i.e. extended in time. However, some are not: there were 11 occurrences of *shoot to death*, for example. There is nothing to rule this out, since a path can be very short. Perhaps for markedness reasons, there is a tendency to select *dead* over *to death* when possible.

(27)   *To death*: 547 occurrences:[6] *stab* (114), *beat* (74), *batter* (39), *frighten* (34), *crush* (25), *scare* (24), *burn* (18), *torture* (16), *drink* (15), *starve* (15), *bludgeon* (12), *hack* (12), *shoot* (11), *kick* (11), *club* (9), *bore* (8), *knife* (8), *choke* (8) . . . (many, many other verbs)
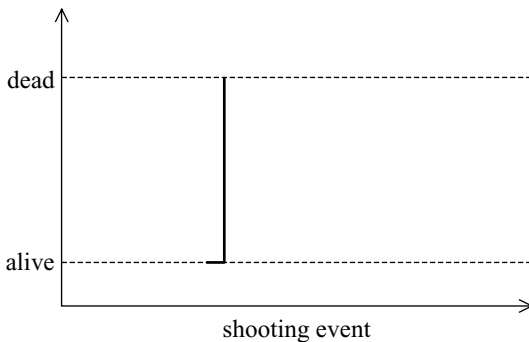
FIGURE 12.3 A sample 'shooting dead' event

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[6] Not including 44 occurrences of the idiom *put to death* ($\neq$ 'make dead by putting').

> Example: 'Park Manager Paul Weston said the rabbits had apparently been *battered to death*.'

An analysis of all the adjectives tabulated by Boas reveals a striking pattern.[7] Table 12.1 shows open-scale adjectives, including the two minimal end-point or *de facto* open-scale ones. Table 12.2 shows closed-scale adjectives. A comparison of the first columns of the two tables reveals a very striking contrast: closed-scale resultatives are common, while open-scale resultatives are virtually non-existent, replaced instead by the *make*-causative strategy. This strongly confirms the present analysis.

12.5 Semantic composition vs. interpretation

An interesting implication of our account is that boundedness must be part of the lexico-semantic structure of the resultative adjective. That is, the adjective must have an inherent bound; a bound provided by pragmatic context is insufficient. In that regard the semantic composition of the adjective with the resultative clause differs from the primary predication in (28a) and instead resembles the attempt at modification in (28b).

(28)   a. Michael Jordan is tall.

      b. #completely tall; #totally tall

As explained above, (28a) is interpreted to mean that Jordan's height meets or exceeds some contextual standard of tallness. But such a contextual standard will not save modifiers like *completely* or *totally*, as shown in (28b). Instead these modifiers apparently require an adjective with an inherent lexical bound.

TABLE 12.1 Open-scale adjectives (Boas 2000: appendix A)

	Resultatives	*make* causatives
famous	0	37
fat	0	5
ill	0	65
sleepy	0	19
sore	1	11
tired	0	18
dirty*	0	8 (+33 *get*-causatives)
wet*	0	12

*Minimal end-point ('*de facto* open-scale') adjectives.

[7] Boas searched his corpus for occurrences of 50 specific resultative phrases (adjectives, PPs, and particles).

TABLE 12.2 Closed-scale adjectives (Boas 2000: appendix A)

	Resultatives	*make* causatives
clean	102	6
dry	77	8
flat	34	1
full	35	1
open	395	1
red	11	4
shut	207	0
smooth	5	12
solid	3	2

Like these modifiers, the resultative construction requires an adjective with an inherent bound, presumably as a condition on semantic composition of the sentence.

A rough Head-driven Phrase Structure Grammar (HPSG) analysis is sketched in Figures 12.4 and 12.5, where CONTENT is the field for semantic content (cp. semantic structure, logical form, etc.). The lexical rule in Figure 12.4 adds an AP to the list of complements (COMPS) in the verb's subcategorization frame. Crucially, the AP must provide an inherent lexical scale and an end-point (BOUND). Figure 12.5 shows the resultative verb produced when this rule is applied to the verb *hammer*.

Note that it is not sentence telicity *per se* that this construction requires. Atelic resultatives are possible, for example, in sentences with iterative aspect:

$$
V\begin{bmatrix} \text{COMPS} \;⍟ \\ \text{CONT } [\text{THEME j}] \end{bmatrix} \Rightarrow V\begin{bmatrix} \text{COMPS} ⍟ \oplus \left\langle \text{AP}\big[\text{SUBJ}\langle \text{NPj}\rangle\big]:[\text{BOUND}⬚] \right\rangle \\ \text{CONT } \begin{bmatrix} \text{THEME j} \\ \text{BOUND}⬚ \end{bmatrix} \end{bmatrix}
$$

FIGURE 12.4 HPSG Lexical resultativization rule

$$
hammer: \begin{bmatrix} \text{SUBJ} & \langle \text{NP}_i \rangle \\[4pt] \text{COMPS} & \langle \text{NP}_j, \text{AP}\big[\text{SUBJ }\langle \text{NP}_i\rangle\big]:[\text{BOUND } ⬚]\rangle \\[4pt] \text{CONTENT} & \begin{bmatrix} hammer\ reln \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{BOUND} & ⬚ \end{bmatrix} \end{bmatrix}
$$

FIGURE 12.5 HPSG sign for the resultative variant of the verb *hammer*

(29)   John hammered metal/cans flat (for an hour / (#)in an hour).

This shows that the boundedness requirement applies 'before' sentence aspect is calculated. Boundedness is a condition on the lexical semantic structure of the words involved, not on the final interpretation of the sentence.

12.6 ECM resultatives

Now let us consider Exceptional Case-Marking resultatives such as (5d) or (7c, d) above. Recall that, by definition, in ECM resultatives the predication subject is not an argument of the verb. As noted already at the end of section 12.2 above, the fact that the predication subject for ECM resultatives is not part of the argument structure of the verb means that no homomorphism or coextensiveness requirement obtains. This is illustrated by example (30).

(30)   We laughed the speaker off the stage.

The verb-denoted main event, namely our laughter, and the change along the property scale (or 'path'), namely the speaker's exit from the stage—are not necessarily coextensive. Nor do ECM resultative constructions evince the strict homomorphism between the main event and the change along the property scale that we found to be characteristic of control resultatives. Levin and Rappaport-Hovav (1999) note that in contrast to control resultatives, ECM resultatives allow for the main and result events to receive independent temporal modification:

(31)   'Peter quickly read himself into an inferiority complex, after a few slow deliberate readings of his classmates' theses.' (from Levin and Rappaport-Hovav 1999)

Levin and Rappaport-Hovav argue that control resultatives involve a tighter fusion of the events than do ECM resultatives—a similar point to the one being made here, although modelled differently and supported by different types of evidence.

An examination of the Boas corpus reveals that open-scale adjectives strongly resist appearing in control resultatives, but do appear occasionally in ECM resultatives (see *hoarse* and *sick* in Table 12.3). The *completely* test confirms that these adjectives are open-scale: to the extent that one can say *completely hoarse/sick/* etc., the modifier means something like 'very', as shown by the fact that the following is not contradictory: *I am completely sick, but Susan is even sicker* (see n. 2 above). We predict that resultatives

TABLE 12.3 Open-scale adjectives

	Control	ECM	Miscellaneous
insane	0	0	23 subcategorized by *drive*; 1 by *send*; 1 *make*-causative
safe	0	0	67 *make*-causatives
mad	0	0	108 subcategorized by *drive*; 5 by *send*; 35 *make*-causatives
hoarse	0	9	1 *make*-causative
sick	1	12	136 *make*-causatives

formed with such adjectives will be atelic, which appears to be confirmed by the imperfective entailment test:[8]

(32) a. We were yelling ourselves hoarse ⇒ We yelled ourselves hoarse.

  b. We were worrying ourselves sick. ⇒ We worried ourselves sick.

  c. We were laughing ourselves silly. ⇒ We laughed ourselves silly.

While the exact aspectual conditions on ECM resultatives are not known, it is clear that they are considerably freer than control resultatives. For some ECM resultatives, the result-state model of telicity (e.g. Dowty 1979) is appropriate. For others, the resultative functions as an intensifier (e.g. (32)). The tight restrictions following from the event–argument homomorphism need not apply to ECM resultatives, for the simple reason that by definition the predication subject for the ECM resultative predicate is not an argument of the event-denoting verb. This has important consequences for the putative Direct Object Restriction, as we will see in the next section.

12.7 The Direct Object Restriction (DOR) revisited

Years of study of thematic roles have shown that affected themes tend to be objects rather than subjects, when the verb is transitive (cf. the Proto-Patient role of Dowty 1991; the placement of affected themes at or near the bottom of most proposed thematic hierarchies; and so on). Call this correlation the 'theme–object tendency.' From the theme–object tendency alone it follows that resultatives tend to be predicated of objects. Is there, in addition, a structural syntactic constraint that is responsible for the DOR in resultatives?

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[8] If *hoarse* is interpreted literally, then *yell ourselves hoarse* becomes telic, the entailment in (32a) no longer holds, and the following becomes contradictory: *#I am completely hoarse, but Susan is even hoarser.*

Strong evidence against a further structural constraint is that exceptions to the theme–object tendency are also exceptions to the DOR. First, all unergative motion verbs are exceptions, as noted by Levin and Rappaport-Hovav (1995):

(33) a. She danced/swam *free of her captors.* (p. 186)

      b. However, if fire is an immediate danger, you must jump *clear of the vehicle.* (State of Illinois, *Rules of the Road*; cited p. 186)

      c. The driver and the fireman had jumped *clear* before the crash. (*Thomas the Tank Engine*)

Second, there are even some transitive verbs with affected theme subjects. If conditions are right, these allow resultative predicates (Wechsler 1997):

(34) a. The wise men followed the star *out of Bethlehem.*

      b. The sailors managed to catch a breeze and ride it *clear of the rocks.*

      c. He followed Lassie *free of his captors.*

This shows clearly that to the extent that the DOR holds, it is epiphenomenal—it is just a side-effect of argument mapping generalizations. The DOR *qua* syntactic constraint would seem to be dead.

However, the alternative of a 'Theme Restriction' (cf. Van Valin 1990: 254 ff.) alone cannot explain this contrast (as noted by Bresnan and Zaenen 1990, who cite Rappaport and Levin):

(35) a. *We danced tired.

      b.   We danced ourselves tired.

But now we have the answer: (35a) is unacceptable because *tired* is an open-scale adjective, and hence inappropriate for a control resultative. In contrast, (35b) is acceptable because as an ECM resultative it lacks the aspectual requirements following from the event–argument homomorphism. Thus the predicate *tired* is just as infelicitous with an object as with a subject—if that object is an argument of the verb:

(36)   *The coach trained us tired. (=8b)

In sum, the fact that resultative predication subjects tend to be 'deep' objects follows from the semantics of the construction, together with the independent generalization that affected themes tend to be objects. The contrasts between control resultatives and 'fake reflexive' resultatives do not weaken this conclusion, because they receive an independent explanation.

12.8 Summary and conclusion

The premise that (control) resultative constructions are telic, understood under the event–argument homomorphism model, explains three classes of empirical observations: (i) lexical variation with respect to the aspectual type of the verb and the scalar semantics of the resultative adjective; (ii) selection of PP vs. AP resultatives; and (iii) the generalization regarding possible predication subjects previously adduced in support of the DOR. See Beavers (2002) for a formal semantic analysis along the lines proposed here; and see Wechsler and Noh (2001) for an application of this approach to Korean resultatives.

13

Change-of-State Verbs: Implications for Theories of Argument Projection

MALKA RAPPAPORT HOVAV AND BETH LEVIN

Recent work in argument expression has focused on verbs showing multiple argument projection options, often with concomitant shifts in aspectual classification or assignment of so-called 'aspectual roles' (e.g. measure or incremental theme). Examples illustrating these phenomena are given in (1) and (2). In (1), the verb *read* is telic in the (a) sentence and atelic in the (b) sentence. In (2), *the table* is the measure in the (a) sentence, but *the crumbs* is the measure in the (b) sentence.

(1) a. Dana read the book.

   b. Dana read from the book.

(2) a. Kerry wiped the table clean.

   b. Kerry wiped the crumbs off the table.

The ubiquity of such verbs has given rise to two major ideas concerning argument expression:

(3) a. The Aspectually Driven Argument Projection Hypothesis: Argument projection is aspectually driven.

   b. The Free Argument Projection Hypothesis: Argument expression is not lexically determined.

The first hypothesis—that argument projection is aspectually driven—finds perhaps its earliest explicit statement as Tenny's (1987; 1992*a*; 1994) Aspectual Interface Hypothesis and has subsequently been quite widely adopted (e.g. Arad 1998; Borer 1998). Proponents of this hypothesis often establish a connection between direct objecthood and notions such as telicity (van Hout 1996; Ritter and Rosen 1998), incremental theme (Rothstein 2000), measure (Tenny 1994), or subject of result (Borer 1998). This hypothesis is tied explicitly to the phenomena in (1) and (2) by van Hout's (1996) proposal that argument alternations represent event type-shifting. Indeed, many alternations can be so understood. Arguments that are alternately expressed as direct object and oblique, e.g. (1), reflect alternations between telic and atelic uses of verbs, while alternate choices of direct object, e.g. (2), are a reflection of alternate choices of the argument which determines the telicity of the sentence, i.e. incremental theme or measure.

The pervasiveness of multiple argument realization brought the traditional analysis of the relation between the lexicon and syntax—that verbs lexically determine the expression of their arguments—under renewed scrutiny. Specifically, various researchers, starting with Hoekstra and Mulder (1990), have instead proposed that argument expression is not lexically determined. Proponents of extreme versions of this hypothesis posit that arguments are projected freely onto syntax, with verbs being unspecified for those components of meaning that determine argument expression; this hypothesis is what we have referred to as the Free Argument Projection Hypothesis. The interpretation of a sentence is derived from the meaning of the verb in combination with the way in which its arguments are projected. Although lip-service is often paid to the idea that a verb's meaning must be compatible with syntactically determined meaning (Ghomeshi and Massam 1995; Hoekstra and Mulder 1990), it is the free projection of arguments which is stressed and put to work, while the explication of compatibility is taken to be trivial.

The ideas embodied in the two hypotheses—that argument expression is not lexically determined and that aspectual notions determine argument expression—go together naturally. In fact, many current theories of argument realization assume a conjunction of the two: aspectual properties are compositionally derived in syntax (Arad 1998; Borer 1998; Ritter and Rosen 1998). Verbs project their arguments freely onto syntax; the aspectual roles of arguments and the aspectual interpretation of the sentence are determined by the nature of this projection: aspectual composition is effected by checking or interpreting aspectual features in functional projections. This represents a departure from traditional theories of aspectual composition, which assume argument expression merely reflects aspectual composition.

Although much recent work incorporates the conjunction of the two hypotheses, they represent two distinct issues: whether argument expression is aspectually driven and whether argument expression is lexically or syntactically determined. It is possible to adopt one without the other. For instance, Tenny (1987; 1992*a*; 1994) argues that argument projection is aspectually driven but determined by individual verbs, so that argument expression is lexically determined. Alternatively, it could be hypothesized that argument expression is lexically determined, but not by aspectual properties. Furthermore, the extreme versions of these hypotheses may turn out to be untenable, with aspect being one, but not the sole, determinant of argument expression, and argument expression being partly, but not completely, lexically determined. For example, Jackendoff (1990) develops a theory in which both aspectual and non-aspectual elements determine argument expression, and his theory combines lexical and non-lexical argument projection.

Here, we argue against the extreme versions of each individual hypothesis, as well as against their conjunction. That is, while acknowledging the results of recent research that argument expression is not entirely lexically determined, a point underscored in Butt and Geuder (1998), we stress that a verb's lexicalized meaning is nonetheless important to determining or constraining its argument expression options (see also Erteschik-Shir and Rapoport, this volume). Furthermore, we argue that aspectual properties alone do not determine argument expression. We make this point through a close examination of the argument expression properties of change-of-state (COS) verbs—verbs lexicalizing a change of state—and a comparison of these properties with those of aspectually related verbs. We demonstrate that the meaning that is lexicalized in a verb to a large degree determines its grammatical and interpretive properties. We further show that the relevant facets of verb meaning do not correspond to well-known aspectual notions. As a first step in making this point, we examine COS verbs and show that, although uniform in argument expression, they are not uniform aspectually.

13.1 Uniformity in argument expression is not aspectual uniformity

If argument projection is not lexically determined, then argument projection options are expected to be largely unconstrained. Indeed, proponents of the Aspectually Driven Argument Projection Hypothesis have paid particular attention to argument alternations for this very reason. It is striking, though, that COS verbs—which have long been known to exhibit distinctive argument realization properties (Fillmore 1970*a*; 1977; Levin 1993)—have not figured in these discussions. The most outstanding feature of these verbs is the severely

constrained nature of their argument realization options. In particular, the patient argument—the entity undergoing the change of state—must be expressed and can only be expressed as a direct object, as we now illustrate.

First, the patient must be expressed. Although other verbs are found in any of a number of frames with an argument left unexpressed, COS verbs are not usually found in such frames without their patient. Specifically, they are not found with unspecified objects, as in (4), nor are they found in resultative constructions with non-subcategorized objects, as in (5) and (6), nor do they allow *out*-prefixation, as in (7). These last two frames resemble the unspecified object frame, in that the verb's normal direct object is left unexpressed.[1]

(4)   *Pat broke/dimmed.

(5)   a. *My kids broke me into the poorhouse.

       b. *The stage-hand dimmed the scene dark.

(6)   a. *I broke myself out of a set of dishes.

       b. *Jones dimmed his way out of the house.

(7)   a. *The two-year old outbroke the three-year-old.

       b. *The stage-hand outdimmed the director.

Furthermore, the patient must be the direct object and cannot be an oblique, as in (8). Consequently, COS verbs are not found in object alternations in which the argument which is normally the direct object 'vacates' its position for another NP, being expressed instead as an oblique, as in (9).

(8)   a. Alex broke the vase/*Alex broke at the vase.

       b. Sam dimmed the lights/*Sam dimmed at/from the lights.

(9)   a. Kelly broke my arm.

       b. *Kelly broke me on the arm. (cf. Kelly hit me on the arm.)

The lack of argument alternation also emerges when the interpretation of the sentence pair in (10) with *break* is compared to that of the superficially parallel sentence pair with the non-COS verb *hit* in (11). As Fillmore (1977a) points out, the *hit* sentences, as near-paraphrases, qualify as an argument alternation.

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[1] Goldberg (2001; this volume) and Mittwoch (this volume) point out that COS verbs are sometimes found with unspecified objects; Goldberg (2001) also notes that COS verbs are occasionally found in resultatives with non-subcategorized NPs. However, as both Goldberg and Mittwoch observe, these uses of COS verbs are attested only in restricted contexts (e.g. generic, habitual, contrastive), while other verbs appear in these constructions even outside these contexts. Thus, COS verbs are special, though such data must be accommodated within a full theory of argument realization.

The *break* sentences, however, are not near-paraphrases; rather, in each the direct object is understood as the patient.

(10) a. Sam broke the fence with the stick.

      b. Sam broke the stick against the fence.

(11) a. Sam hit the fence with a stick.

      b. Sam hit a stick against the fence. (Fillmore 1977a: 75)

These differences are another manifestation of the constraint that the patient of a COS verb must be its direct object. These examples are noteworthy in another way. Although *the stick* in (10) is associated with an entailment of change of location which allows an argument to qualify for direct objecthood (cf. the acceptability of (11b)), as an argument of *break* it can only be the direct object if it is also the patient (i.e. it undergoes a change of state).

   This restricted behaviour is unexpected from the perspective of the Free Argument Projection Hypothesis. Nonetheless, if argument expression is taken to be aspectually determined, the uniformity in argument expression of COS verbs might be attributed to a shared aspectual property, at least supporting the Aspectually Driven Argument Projection Hypothesis. However, COS verbs lack a uniform aspectual characterization, at least in terms of the traditional notions of telicity and punctuality. When COS verbs take a definite, singular object, they can be necessarily telic (e.g. *break, dry, explode, flatten, freeze*) or either telic or atelic (e.g. *cool, darken, dim, widen*). Variable telicity, in fact, is the distinguishing property of the much-discussed set of COS verbs known as 'degree achievements' (Abusch 1986; Dowty 1979; Erteschik-Shir and Rapoport, this volume; Hay et al. 1999). Furthermore, when telic, some COS verbs are punctual (e.g. *break, crack, explode*), while others are durative (e.g., *cool, dim, dry, freeze, widen*). Despite these differences in aspectual potential, all COS verbs show the same behaviour. We illustrated the properties of COS verbs using the verbs *break* and *dim*, which are chosen because they differ along aspectual dimensions. First, *break* is necessarily telic, while *dim*—a degree achievement—may be telic or atelic. Second, *break* is punctual and *dim* is durative. Yet both verbs show the same argument realization patterns.

   COS verbs, then, share a constrained set of argument projection possibilities, but are not uniform aspectually. These observations suggest that aspectual classification alone does not determine argument expression. The Aspectually Driven Argument Projection Hypothesis is undermined, unless some other aspectual property can be shown to unify the class of COS verbs. We now address this issue.

13.2 Probing the contribution of aspect to argument expression further

13.2.1 *Verbs with incremental themes show different argument projections*

Much current work suggests that the aspectual notion most relevant to argument projection is 'incremental theme' (Dowty 1991) or one of its relatives. Krifka (1992) suggests that incremental theme verbs have an argument that is lexically associated with the property of 'mapping to events', i.e. parts of the entity denoted by that argument can be mapped onto parts of the event denoted by the verb. For example, when you drink a glass of water, the event is half over when half the water has been consumed. Therefore, it might still be the case that argument expression is aspectually determined, with the aspectual notion of incremental theme unifying the verbs showing the pattern of behaviour demonstrated by COS verbs. However, as we now show, though the patient of a COS verb acts as an incremental theme, a comparison of COS verbs with other incremental theme verbs suggests that it is not the property of the patient being an incremental theme which determines the argument expression profile of COS verbs.

First, we comment on terminology. The term 'incremental theme' was originally applied by Dowty (1991) to the argument of certain predicates involved in defining a homomorphism from its own physical extent to the temporal progress of the event it participates in. By this definition, verbs like *read, write*, and *eat* are incremental theme verbs. Dowty (1991: 568) also intended this term to cover the patient argument of COS verbs, but its application to these verbs needs clarification. The sentence *Matt closed the door half-way* does not entail that half the door was closed, but that the door was half-way closed. The mapping involves a property of the door and not the door's own physical extent. Recent studies (Hay et al. 1999; Krifka 1998; Ramchand 1997; Tenny 1992*a*; 1994) have found ways to provide parallel aspectual analyses to COS verbs and traditional incremental theme verbs. Patients of COS verbs and traditional incremental themes are associated with some property—a scalar property of the object lexicalized by their verb for the former and the physical extent of the object for the latter—which serves as a scale for measuring the temporal progress of the entire event. When the event describes a specified degree of change on the scale, it is telic, and when it describes an unspecified degree of change, it is atelic (Kennedy and Levin 2001). The objects of both traditional incremental theme verbs and COS verbs, then, share an identical aspectual role, which we continue to call 'incremental theme', in that both verb types are associated with a scale for measuring the event's progress.

The parallelism can be brought out further. It is well known that the quantization of the direct object of a traditional incremental theme verb determines the telicity of its sentence, as in (12). The physical extent of the object provides the scale for measuring the progress of such events. If the object is not quantized, as in (12b), the scale lacks a specified end-point, the change on this scale is unspecified, and the sentence is atelic. If the object is quantized, as in (12a), its physical extent is specified, as is the change on the associated scale, and the sentence is telic.

(12)   a. Dana read poetry for/*in an hour. (atelic)

b. Dana read the newspaper for/in an hour. (telic)

The telicity of a sentence with a COS verb also depends on the nature of the change on the associated scale. The relevant change, however, is determined by a scalar property lexicalized in the verb, not directly by the quantized nature of the direct object. The verb *warm* is associated with a temperature scale, and a sentence with this verb is telic if the change in temperature is specified and atelic otherwise, as in (13); see Kennedy and Levin (2001) for more discussion.

(13)   a. Sandy warmed the solution for three minutes. (atelic)

b. Sandy warmed the solution five degrees in three minutes. (telic)

We now turn to the argument expression options of incremental themes. Although parallel aspectual analyses are available for both incremental theme and COS verbs, traditional incremental theme verbs are more flexible in their argument expression properties than COS verbs. First, the argument that serves as the incremental theme when these verbs are used transitively need not be expressed. These verbs permit unspecified objects, as in (14); they also allow non-subcategorized NP objects, either in a resultative construction or via *out*-prefixation, as in (15) and (16) (cf. (4–7)). Furthermore, this same argument need not be expressed as direct object, as in (17), though it is then no longer an incremental theme (cf. (8)). Thus, verbs that have an incremental theme do not show uniform argument expression properties.

(14)   Dana read/ate/wrote.

(15)   a. The teacher read us into a stupor.

b. My kids ate me into the poorhouse.

c. I wrote myself out of a job.

(16)   Pat outread/outate/outwrote Chris.

(17)   a. Dana read the book./Dana read from the book.

    b. Chris ate the apple./Chris ate from/of the apple.

    c. I wrote my book./I wrote at my book.

13.2.1.1 *Comparison with potential incremental theme verbs*   Verbs like *read, write*, and *eat*, which invariably allow their direct object to be interpreted as an incremental theme, may be contrasted with potential—or 'latent' (Tenny 1992*a*: 20)—incremental theme verbs, a class we exemplify with surface contact verbs (e.g. *comb, rub, scratch, shovel, sweep, wipe*). Such verbs do not require their 'normal' direct object, even when quantized, to be analysed as an incremental theme.[2] That is, in the presence of a quantized object they may pattern as telic or atelic with respect to standard telicity tests, as in (18) and (19).

(18)   a. Lee scrubbed the tub for hours. (atelic)

     b. Lee scrubbed the tub in three minutes flat. (telic)

(19)   a. Lee is scrubbing the tub and has scrubbed it for the last hour. (atelic)

     b. Lee is scrubbing the tub and still hasn't finished. (telic)

These verbs may be atelic because they describe processes that can be applied indefinitely to a surface. Their telic uses most likely arise because the processes they describe are usually carried out with specific intended results, though these verbs do not entail the achievement of any result (Talmy 2000). The intended result gives rise to an associated scale. With *scrub*, two scales are possible. One is provided by the tub's surface area, with the process being complete when the scrubbing has covered the entire tub. Alternatively, the desired result may be a clean tub, with the scale being one of cleanliness. On either interpretation, the object is an incremental theme: on the former, the event is over when the whole tub is scrubbed, and on the latter, the event is over when the tub's state reaches the point of cleanliness.

    The 'normal' direct object of surface contact verbs is considered a location in a traditional semantic role analysis (Fillmore 1970), but these verbs may also take as their object an argument describing material found at this location (Levin and Rappaport Hovav 1991), giving rise to an argument alternation, as in (20). When the material is the object, it too can be the incremental theme by

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[2] In fact, traditional incremental theme verbs (e.g. *read, write, eat*) also show atelic readings with quantized objects (Hay et al. 1999; van Hout 1996; Tenny 1994). *Pat read the newspaper for an hour* is at least somewhat acceptable, and some speakers even find it fully acceptable. In contrast, speakers agree that a potential incremental theme verb with a quantized object is perfectly acceptable with an atelic interpretation.

virtue of its physical extent: it determines telicity when quantized, as shown in (21).

(20)   Lee scrubbed the tub./Lee scrubbed the stains off the tub.

(21)   a. Lee scrubbed blood off the tub for ten minutes. (atelic)

       b. Lee scrubbed the blood off the tub in ten minutes. (telic)

Like traditional incremental theme verbs, these potential incremental theme verbs show a broad range of argument expression possibilities. Surface contact verbs need not express either the material or the location. They do not require the expression of an object, as in (22), and can take non-subcategorized NP objects, either in resultative constructions or via *out*-prefixation, as in (23) and (24).

(22)   Lee swept/wiped/scrubbed.

(23)   Cinderella scrubbed her fingers to the bone.

(24)   a. Cinderella outswept/outscrubbed her stepsisters.

       b. This hairdresser outcombed that one.

Finally, potential incremental theme verbs do not impose semantic restrictions on their direct object: it can be the material, as in *Lee scrubbed the stains*, the location, as in *Lee scrubbed the tub*, or a non-argument, as in (23) and (24). The material and location arguments, though potential incremental themes, need not be expressed as objects; they can also be expressed as obliques. (25) illustrates material arguments as obliques and (26) illustrates location arguments as obliques.

(25)   a. I scrubbed at extra-bad stains with a nailbrush and Fels Naptha. (Google)

       b. Lee scratched at the mosquito bites.

(26)   a. I've emptied out the house, swept and mopped, and scrubbed at the baseboards. (Google)

       b. Lee scratched at her arm.

In conclusion, COS verbs share an important aspectual property—an incremental theme—with other verbs, but do not share their argument expression properties.

13.2.2 *Lexical influences on the choice of incremental theme*

Traditional and potential incremental theme verbs have been used to support the claims that verbs are not lexically specified for an incremental theme, and

that an argument or other NP projected onto the direct object position (or whatever its formal definition is taken to be, e.g. Spec, AgrO) is interpreted as the incremental theme. Indeed, whichever argument or other NP is chosen as the object of these verbs is construed (or construable) as their incremental theme.

Although this variability in the choice of direct object/incremental theme is characteristic of some verbs, and needs to be accounted for somehow, it is not exhibited by COS verbs. As discussed in section 13.2.1, the patient of a COS verb *must* be construed as the incremental theme of its sentence, and no other argument or NP may be so construed. COS verbs, at least, seem to have lexically specified incremental themes. Construal as an incremental theme, then, is not always the result of the free projection of an argument onto a specific syntactic position.

It seems, then, that some verbs are lexically specified as taking a particular argument as incremental theme (e.g. COS verbs), while others are not (e.g. traditional and potential incremental theme verbs). If this is the case, then it may be possible to maintain a form of the Aspectually Driven Argument Projection Hypothesis, while abandoning the Free Argument Projection Hypothesis: with COS verbs, the entity associated with the change-of-state entailment is lexically constrained to be the incremental theme, with the limited argument projection options of these verbs following from this assumption. This appears to be the gist of Dowty's (1991: 568) suggested analysis of these verbs. The other classes of incremental theme verbs would not lexically specify a particular argument as incremental theme, and thus would show more argument expression options. On this approach, a lexically specified aspectual property still determines argument expression, although it is lexically and not compositionally determined.

This proposal, however, is predicated on two assumptions: incremental themes are constrained to be direct objects, and in the presence of an incremental theme no other argument may be the direct object. However, neither assumption is correct. First, Dowty (1991: 570) and Jackendoff (1996: 313) have pointed out incremental themes which are not direct objects, as in *The train crossed the border* and *The parade passed the mayor*, where the event is half over when half the train has crossed the border or half the parade has passed the mayor. Second, in some instances one argument may serve as an incremental theme even when another is expressed as direct object. This situation is found in the dative alternation, shown by verbs of transfer. With these verbs, the theme of transfer normally determines telicity, as in (27).

(27)   a. Dana read poetry to employees/her niece for an hour. (atelic)

     b. Dana read the story to employees/her niece in an hour. (telic)

Despite Arad's (1995) suggestion that the dative alternation is aspectually motivated (though see also Arad 1998), the theme of transfer is still the incremental theme when the recipient becomes the direct object in the double object construction. In (28) the recipient is the first object—taken to be the double object construction's instantiation of a direct object—and the theme, though the second object, still determines telicity.

(28)   a. Dana read her niece poetry for an hour. (atelic)

     b. Dana read her niece the story in an hour. (telic)

Therefore, this alternation in direct object choice cannot be aspectually driven (see also Baker 1997), and a *de facto* incremental theme 'relinquishes' its position as direct object to another argument. Recently, some researchers have proposed that the recipient in a double object construction is not an underlying direct object (the theme is), but rather has become the specifier of a higher functional projection (Baker 1997). Although this analysis is meant to explain why recipients do not show the full range of direct object properties (Baker 1997; Maling 2001), this analysis is incompatible with approaches to argument projection that adopt the conjunction of the two hypotheses under consideration. On these approaches, movement into a higher functional projection is supposed to be associated with aspectual shifts, while 'underlying' direct objects (i.e. complements of V) are explicitly not associated with these properties. Yet on Baker's analysis, the theme, which can act as an 'incremental theme', is the "underlying" direct object, while the recipient moves to a higher functional projection.

Finally, there are some incremental themes which are not explicitly expressed. For example, the direct object in *out*-prefixation sentences is not an incremental theme. In *Pat outate Chris*, parts of Chris do not correspond to parts of the outeating event. Rather, the incremental theme seems to be the amount of eating that Pat did (e.g. *Pat was half-way towards outeating Chris*), and this notion is not expressed.

Since the incremental theme of a sentence need not be its direct object, the fact that the patient of a COS verb must be expressed as direct object cannot be attributed to its having a lexically specified incremental theme. The distinctive argument expression properties of COS verbs appear not to follow from any aspectual property of these verbs, whether lexically specified or not. We stress here, though, that we are not arguing against the usefulness of the concept of incremental theme; on the contrary, this semantic notion appears

to be very useful, as it helps to unify a variety of sources of telicity. Its usefulness as a semantic notion does not necessarily make it a notion that argument projection is sensitive to.

13.3 Comparison with verbs having a change-of-location entailment

The unique properties of COS verbs have other ramifications for linguistic analysis. Most researchers draw a parallel between themes of changes of location and patients of changes of state. These parallels were first drawn in localist theories (Anderson 1971; 1977; Gruber 1965; 1976; Jackendoff 1976; 1983), which conceptualize changes of state as instances of changes of location.[3] As discussed in section 13.2.1, an entity lexically entailed to undergo a change of state must be the direct object and must be the incremental theme; in contrast, as we now show, an entity which is lexically entailed to undergo movement can be a direct object, but need not be, and it need not be an incremental theme.

We make this point with the locative alternation verbs *splash* and *spray*, which lexically entail the movement of a liquid substance, i.e. they take an argument that qualifies as a theme of change of location. This argument does not have to be expressed as a direct object; contrast the (29a) with the (29b) and (29c) sentences. In fact, this argument does not need to be expressed at all, as shown in (29c) and (30):

(29)   a. Brett sprayed/splashed water on the plants.

  b. Brett sprayed/splashed the plants with water.

  c. ?Brett sprayed/splashed at the plants.

(30)   Brett splashed/sprayed.

Although the patient of a COS verb must be that verb's incremental theme, the theme of a verb entailing change of location need not be that verb's incremental theme. As locative alternation verbs, *splash* and *spray* allow either a location or a theme of change of location as their direct object. When the location is the object, these verbs pattern like latent incremental theme verbs,

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[3] Jackendoff (1990) proposes that changes of state and changes of location have different predicates in their conceptual structure. He thereby moves away from the strict versions of the Localist Hypothesis adopted in his earlier work (1976; 1983). More recently, this parallel has been used to unify these arguments under the same aspectual concept (Hay et al. 1999; Levin and Rappaport Hovav 1995; Ramchand 1997; Tenny 1992*a*; 1994). Although drawing the parallel may be useful for determining aspectual properties of verbs and for understanding certain kinds of metaphorical meaning extension, it seems that the entailment of a change of state and the entailment of a change of location constrain an argument's projection in different ways.

since the telicity of their sentence is not necessarily determined by the quantized nature of the object, but it may be (Dowty 1991; Jackendoff 1996).

(31)   a. Bill sprayed the wall with paint for five minutes. (atelic)

b. Bill sprayed the wall with paint in an hour. (telic)

It is noteworthy that the location is a potential incremental theme, though these verbs also have an argument that is a theme of a change of location. COS verbs, in contrast, do not allow their patient argument to abdicate incremental themehood to another argument. The special properties of COS verbs, then, are characteristic of just this semantic class and do not generalize to other semantic classes of verbs, even one that has been given a parallel semantic analysis.

13.4 Conclusion

The argument expression possibilities of COS verbs appear to be determined by a non-aspectual, lexicalized property—change of state—and cannot be handled by purely aspectual non-lexical theories of argument projection. Traditional aspectual classes, then, do not constitute natural classes from the perspective of argument expression. Furthermore, the investigation of COS verbs has also shown that the extreme versions of both the Aspectually Driven Argument Projection Hypothesis and the Free Argument Projection Hypothesis are not tenable.

This chapter, however, has not identified an alternative source for the unique argument projection properties of COS verbs. Rappaport Hovav and Levin (1998) consider some of the properties of these verbs as part of a larger investigation into the nature of verb meanings. They propose that verb meanings are constituted of a basic association between constants—or what are now most often called verb 'roots'—typed by ontological category and non-aspectually defined event structures. These constant-event structure pairs, in turn, constrain argument projection, an idea also espoused by Hale and Keyser (1998). Although Rappaport Hovav and Levin (1998) may not fully account for all the data we have discussed in this paper, their approach seems to us to be in the right direction. That is, closer scrutiny of the semantic content that defines a verb root should lead to a deeper understanding of the ways in which these roots interact with argument expression.

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