STATES, CHANGES OF STATE, AND THE MONOTONICITY HYPOTHESIS

A DISSERTATION
SUBMITTED TO THE DEPARTMENT OF LINGUISTICS
AND THE COMMITTEE ON GRADUATE STUDIES
OF STANFORD UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Andrew Koontz-Garboden
January 2007

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

(Beth Levin) Principal Advisor

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

(Cleo Condoravdi)

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

(Paul Kiparsky)

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

(Peter Sells)

Approved for the University Committee on Graduate Studies.

Abstract

This dissertation examines the Monotonicity Hypothesis (MH), the widely assumed, but rarely discussed idea that while word formation operations can add decompositional operators to a word's lexical semantic representation, they cannot remove them. Adopting modified versions of Dowty's (1979) decompositional representations of states (e.g., *red*) and changes into states (e.g., *redden*), I observe that the MH makes two strong falsifiable predictions in this domain. First, words naming states should never be derived from words naming changes of state, as this would involve the deletion of a BECOME operator. Data from a number of languages are examined and shown to bear out the prediction, with one apparent exception. Ulwa, an endangered Misumalpan language, appears to have words naming states derived from change of state denoting roots. Detailed examination of Ulwa verbal and adjectival semantics and morphosyntax based on extensive primary fieldwork shows that this is an illusion. Given the widely held view that the semantic representation of inchoative verbs lacks the CAUSE operator present in the representation of causative verbs, a second strong prediction is that inchoatives should never be derived from causatives. This is apparently falsified by anticausativization, in which an inchoative verb is derived from a causative verb, e.g., Spanish *romper* 'cause to become broken' versus *romper se* 'become broken'. Building on Chierchia (2004), I argue instead for a reflexivization analysis of anticausativization, showing that it captures a wide range of facts of the phenomenon not accounted for by alternative approaches, most notably facts showing that derived inchoatives retain the CAUSE operator of the causatives from which they are derived. This analysis is consistent with the MH, since it entails no deletion of decompositional operators. Finally, I lay out several areas for future research. Formally, the relationship of the MH to the Principle of

Compositionality remains to be clarified. Empirically, the MH makes many falsifiable predictions beyond the domain of states and changes of state, which suggest areas for promising future crosslinguistic investigation. Research of both kinds will shed further light on the MH and more broadly on the semantic nature of word formation operations.

Glossing conventions

ACC	accusative case
ADJ	the morpheme appearing on Ulwa words naming property concept states
AUD	audative (in Ulwa)
AUX	auxiliary
CAUS	causative
COP	copula
–DA–	*–da–* verb class marker (in Ulwa)
DEF	definite article
DS	different subject switch reference marking
ERG	ergative case
FUT	future tense
IMPER	imperative
INCH	inchoative
INDEF	indefinite article
INF	infinitive
INTERR	interrogative marker
IRR	irrealis modality
IRREV	marker of irreverence
NEG	negative
NOM	nominative case
NON-NOM	non-nominative case (in Ulwa)
PA	*–pa–* verb class marker (in Ulwa)
PAST.PART	past participle

PAST	past tense
PL.EXCL	plural exclusive (of first person plural in Ulwa)
PL.INCL	plural inclusive (of first person plural in Ulwa)
PL	plural
PRES	present tense
PRF	perfective aspect
PRFCT	perfect aspect
PROG	progressive aspect
PRSTNL	presentational marker (in Tongan)
QUOTE	quotative marker
RAUPI	the Ulwa marker *raupi*, described in Chapter 4
RECIP	reciprocal
REFL	reflexive
RES	resultative marker (in Eastern Armenian)
SENT-KA	the sentential *ka* marker in Ulwa, described in Chapter 4
SING	singular
SS	same subject switch reference marking
TA	–*ta*– verb class marker (in Ulwa)
TOP	topic marker
WA	–*wa*– verb class marker (in Ulwa)
1,2,3	1st, 2nd, 3rd person agreement
< >	Gloss inside angle brackets indicates glossed morpheme is an infix

Acknowledgements

Writing these acknowledgements has been a humbling experience; I have been extraordinarily well-supported, personally and professionally, over the last many years ...

My advisor, Beth Levin, has set the highest of standards for the kind of work I aim to do: research that is empirically well-grounded, crosslinguistically oriented, and relevant across a range of theories. In addition to being an academic role model, she has supported me in innumerable ways, not only intellectually in our weekly meetings, but also by: employing me on her NSF project; funding work on Tongan; being very generous with her colossal library; supporting (in many ways) multiple grant applications to fund my work on Ulwa; and reading and commenting on long and semi-coherent (at best) missives on Ulwa grammar sent from the Nicaraguan jungle. For all of this, and much more, I am grateful.

The other members of my committee have been no less instrumental in my development as a linguist and in setting good examples to follow more generally. It would be impossible to overstate the impact Paul Kiparsky has had on me intellectually. The most fascinating meetings I've had during my time as a graduate student have been with Paul. He's genuinely interested (and knowledgeable) in seemingly everything and always has profound and topical questions and feedback that have kept me focused both on the predictions of my analyses and on their larger consequences. Beyond the wonderfully useful feedback Peter Sells has always (very promptly!) provided, he gave me a trajectory-changing experience working with him and my graduate student colleague Judith Tonhauser on the NSF Terascale Linguistics Initiative and later on an NSF grant application. The latter of these was an eye-opening introduction to grant writing, and although it wasn't successful, the experience ultimately gave me the needed confidence and know-how to undertake my own successful applications for grant money, without which my work on Ulwa would not have proceeded. I also feel extremely privileged to have had Cleo Condoravdi agree to serve on my committee. My meetings with her, although relatively few, have been extraordinarily productive and very enlightening. Her sharp comments have made the dissertation much better than it otherwise would have been and have no doubt saved me from (at least some) embarrassment. Finally, many other (current and former) Stanford faculty members have had a positive impact on my graduate student experience and ultimately on the dissertation, among them: David Beaver, Joan Bresnan, Eve Clark, Edward Flemming, John Rickford, Ivan Sag, Elizabeth Traugott, Tom Wasow, Annie Zaenen, Arnold Zwicky, and Will Leben, who aside from the usual faculty duties, also generously loaned Melissa and me his garage for a year to store our stuff while we were in Nicaragua.

I suspect that I've learned at least as much outside of class from my Stanford graduate student colleagues over coffee and beer as I did in class from faculty members. In particular, I have benefited from a critical mass of students interested in semantics during my time at Stanford: Tanya Nikitina, Itamar Francez, Ashwini Deo, John Beavers, Judith Tonhauser, Dmitry Levinson, Scott Grimm, Philip Hofmeister, David Oshima, Iván García Alvarez, Lis Norcliffe, Doug Ball, Laura Whitton, and Nola Stephens. And, Stanford being the place it is, I have learned just as much about linguistics more broadly and had encouragement from people whose specialization is outside of semantics: Mary Rose, Lev Blumenfeld, Alex Jaker, Florian Jaeger, and Bruno Estigarribia. I owe a big thanks especially to John Beavers and Itamar Francez, who have been sounding boards for my thoughts (linguistic and otherwise) for the last several years. In many cases, major advances have come about as results of discussion with one or both of them. I also have several fellow grad students to thank for painstakingly proofreading the final version of the dissertation: Doug Ball, Scott Grimm, and Jason Grafmiller.

Thanks to the Stanford colloquium series, the Construction of Meaning Workshop, linguistics summer schools, other events, and email, I have come in contact during my graduate years with a number of linguists beyond the Stanford bubble that have provided important feedback on my work that has substantively impacted my thinking. Among them are: Daniel Kaufman (who provided invaluable help with the Tagalog data in Chapter 3), Elena Benedicto, Martin Haspelmath, Shelly Lieber, Maria Bittner, Mark Baker, D. Gary Miller, Jimmy Lin, Eric Jackson, Marcus Smith, Florian Schaefer, Artemis Alexiadou, Steve Wechsler, Melissa Bowerman, Martina Faller, Dalina Kallulli, Sergei Tatevosov, Marianne Mithun, Juergen Bohnemeyer, Ruth Rouvier, and Andrew Garrett. Also, while at Indiana University, George Candler, Rich File, members of the Department of Linguistics at IU, and especially Clancy Clements, had big impacts on me and their influence was important in my decision to pursue linguistics in more depth.

I owe an enormous debt of gratitude to the community of Karawala, Nicaragua and particularly to the members of the Ulwa Language Project and their families: Clementina Simón, Abanel Lacayo, Francisco Santiago, Kandler Santiago, Lorinda Martínez, and Alberto Santiago. They all went far beyond the call of duty in making sure that both Melissa and I remained in good health during our time in Karawala, offering food, their houses, organizational resources, camaraderie, and much more. Thanks to their generosity, energy, and extraordinarily impressive linguistic skills, the time in Karawala was easily some of the best spent, both professionally and personally, during my graduate school years. *Upil palka*!

I have Elena Benedicto and Tom Green to thank for encouraging my interest in working on Ulwa at very early stages. Elena, for her part, agreed to take a total stranger on a whirlwind tour of Nicaragua in January, 2004, introduced me to the community and, along with Guillermo Mcclean, oriented me to the research environment on the coast. I'm also grateful to her for her general spunk, sense of justice, and for inspiring (and lively!) conversations. Tom Green, like Elena, welcomed me as a total stranger to Boston in June, 2004 for what he termed an "Ulwa Geekfest" before the onset of my fieldwork. In addition to giving me all sorts of practical advice, he also gave me unfettered access to his store of Ulwa files, and made available an electronic copy of the Ulwa dictionary, which has been extremely important in moving my work with the Ulwa Language Project along. In Karawala, Melissa and I were very fortunate to meet up with Katie Delahunty and Brian Vaughn, who before leaving Karawala, gave us all kinds of material goods and support. *Tinki pali!* Additionally, a number of colleagues at the Universidad de las Regiones Autónomas de la Costa Atlántica Nicaraguense (URACCAN) in Bluefields were also instrumental in making the work in Karawala possible: Arja

Koskinen, Melvin James Olegario, Guillermo Mcclean, and Nubia Ordoñez.

Finally, I have had a great personal support network in family and friends during my time in graduate school and especially while writing this dissertation. Several close friends have kept me sane when I couldn't handle any more dissertation-induced monk-like solitude: Itamar Francez, Philip Hofmeister, Lev Blumenfeld, John Beavers, Judith Tonhauser, Sharon Bottesch, Adam Barker, Tinker, Lola, Basil Fawlty, Jim Hacker, and the Bobs (Dylan and Marley). My mother and father, Susan and Steve Garboden, have always been very supportive (materially, financially, emotionally), of the dissertation, of my interest in pursuing linguistics, and of me in general. I hope this makes up, at least in some small part, for the embarrassment I caused them in my adolescent years!

At long last, we reach my partner Melissa. She has made at least as many sacrifices as I have so that I could pursue linguistics. Often this has taken the form of leaving the comfortable and familiar to explore the unfamiliar, the most salient example of which is certainly her agreement (and excitement!) to undertake fieldwork with me in Karawala. She did this at great personal expense, forfeiting tenure at her school, putting herself in linguistically and culturally unfamiliar terrain, and even exposing herself at times to physical harm. None of this, however, kept her from making great contributions to the Ulwa Language Project in the form of a children's dictionary, counting book, in many other ways. Especially while writing the dissertation, she has been a source of peace and has given me support and love when I need it most. All this while working full-time in a highly demanding job *and* pursuing her own graduate degree. I couldn't agree more with the Karawalans, who quickly observed upon our arrival in the village that Melissa is *yal palka*!

Financial support for the research reported here was provided in part by a Fulbright-Hays Dissertation Research Abroad Fellowship, Graduate Research Funds from the Department of Linguistics at Stanford University, funds from an NSF Small Grant for Exploratory Research (NSF Grant BCS-0004437, P.I. Beth Levin), a Graduate Research Opportunity grant from Stanford University, and a fellowship from the Phi Beta Kappa Northern California Association.

Contents

Abstract v

Glossing conventions vii

Acknowledgements ix

I The Monotonicity Hypothesis 1

1 Introduction 2

1.1 The semantics of word formation 2
1.2 Outline of the dissertation 8

2 Theoretical preliminaries and predictions 11

2.1 Introduction 11
2.2 On word meaning and the semantics of word formation 12
2.3 On the locus of the Monotonicity Hypothesis 18
2.3.1 Intersection 21
2.3.2 The complement 23
2.3.3 Different kinds of objects in the denotation 23
2.3.4 The MH as constraining operations on lexical semantic representations 24
2.4 The MH in broader context 28
2.5 The role of morphology in evaluation of the MH 33

2.5.1 The MH and theories of morphology 33
2.5.2 Morphological markedness, derivation, and evaluation of the MH 34
2.5.3 The MH and productivity 39
2.6 States, changes of state, and the MH 40
2.6.1 States and changes of state 40
2.6.2 Predictions of the MH in the domain of states and changes of state 49
2.7 Conclusion 52

II States 53

3 Two kinds of states 54
3.1 Property concepts versus result states 55
3.2 Lexical semantic representations 58
3.2.1 Result states 58
3.2.2 Property concept states 63
3.3 Predictions of the MH for the two kinds of states 64
3.4 Property concept and result states crosslinguistically 66
3.4.1 Cuzco Quechua 66
3.4.2 Eastern Armenian 68
3.4.3 Tongan 70
3.4.4 Pima 71
3.5 Discussion 72
3.5.1 Words naming result states are derived 72
3.5.2 Words naming property concept states are underived? 77
3.6 Concluding remarks 79

4 Ulwa: A brief introduction 80
4.1 Introduction 80
4.2 Previous work on Ulwa and sources of data 82
4.3 Background on Ulwa grammar 85
4.3.1 Ulwa in the context of Misumalpan more broadly 85

4.3.2 Verb chaining . . . 86
4.3.3 Nominal possession . . . 91
4.3.4 Non-verbal predication . . . 93
4.3.5 The three morphemes *–ka* . . . 96
4.4 Conclusion . . . 104

5 Ulwa verb classes **105**
5.1 Introduction . . . 105
5.2 Overview of Ulwa verb classes . . . 106
5.3 The middle voice and *–da/wa–* . . . 113
5.3.1 Event types . . . 113
5.3.2 Deponents . . . 116
5.3.3 Impersonal uses . . . 118
5.3.4 Functions of *–da/wa–* qua middle voice markers . . . 118
5.4 The *–ta/pa–* suffixes as verbalizers . . . 119
5.4.1 Non-alternating *–ta/pa–* verbs . . . 119
5.4.2 Impersonal verbs . . . 124
5.5 Lexical semantic asymmetries . . . 132
5.5.1 Polysemy in *–ta/pa–* versus *–da/wa–* . . . 133
5.5.2 Change of state event types in the classes . . . 136
5.6 Morphological asymmetries . . . 150
5.6.1 Asymmetry 1: The morphology of infinitives . . . 150
5.6.2 Asymmetry 2: Finite paradigms . . . 152
5.7 Consequences for the Monotonicity Hypothesis . . . 154

6 Derived property concept words in Ulwa **157**
6.1 Ulwa property concept words in more detail . . . 158
6.1.1 Ulwa *–ka* derives free syntactic words from roots . . . 158
6.1.2 Suffixed property concept words are nouns . . . 161
6.1.3 Summary . . . 169
6.2 The MH and the meaning of roots . . . 170
6.2.1 Polysemy . . . 171

6.2.2 Evidence for a derivational relationship 176
6.2.3 Some roots name property concept states, some name changes of state 178
6.3 The derivation of causative COS verbs 184
6.4 Summary and concluding remarks 185

III Changes of state 187

7 Causatives, inchoatives, and the MH 188
7.1 The prediction and the facts 188
7.2 Benchmarks for an analysis of anticausativization 193
7.2.1 Anticausative and passive 193
7.2.2 Morphology 199
7.2.3 Synchrony, diachrony, reflexive and anticausative 200
7.2.4 Alternating and non-alternating verbs 202
7.2.5 Inferential relationship between causative and inchoative 204
7.2.6 The spontaneity inference of the inchoative 204
7.2.7 Formalizability 205
7.3 Analyses of anticausativization 206
7.3.1 Denial 206
7.3.2 Deletion 208
7.3.3 Least common denominator approaches 210
7.3.4 Existential binding 214
7.3.5 Frequency 217
7.4 Concluding remarks 219

8 Anticausativization is reflexivization 220
8.1 Introduction 220
8.2 Anticausativization as reflexivization 221
8.2.1 Assumptions 221
8.2.2 Reflexivization 222

8.2.3 The core of the analysis: alternating COS verbs 223
8.3 Reflexivization and the empirical benchmarks 228
8.3.1 Non-alternation I: *Cut*-type verbs 228
8.3.2 Morphology 233
8.3.3 Non-alternation II: Inchoatives without causatives 241
8.3.4 On the differences between anticausative and passive 242
8.3.5 Inferential relationship between causative and inchoative 249
8.3.6 The spontaneity implication of inchoatives 253
8.3.7 Reflexivization, anticausativization, and diachrony 253
8.3.8 Formalizability 258
8.4 Arguments for a CAUSE in derived inchoatives 259
8.4.1 The Italian *da sé* and Spanish *por sí solo* 259
8.4.2 The “feel like” construction 265
8.4.3 Negation 268
8.4.4 Additional arguments 272
8.5 Discussion and concluding remarks 277

IV Beyond states and changes of state 280

9 The MH in other empirical domains 281
9.1 Manner and manner/path verbs 282
9.2 Manner versus result verbs 284
9.3 Result nouns 288
9.4 Denominal verbs 289
9.5 Augmentative and diminutive derivation 290
9.6 Applicatives 291
9.7 Concluding remarks 293

10 Conclusion 294
10.1 Summary 294
10.2 Major results and areas for future research 300

10.2.1 The Monotonicity Hypothesis, the Principle of Compositionality, and context-free lexical semantics 301
10.2.2 Semantic composition below and above the word level 302
10.2.3 Taking morphology seriously 304
10.2.4 Ulwa 304
10.2.5 Anticausativization 306
10.3 Parting remarks 306

Bibliography **308**

Part I

The Monotonicity Hypothesis

Chapter 1

Introduction

1.1 The semantics of word formation

It seems to be relatively widely acknowledged, especially in recent years, that while structural aspects of word-formation operations have been well-explored, the semantic side of word-formation operations is much less well-understood (Scalise 1986:40; Carstairs-McCarthy 1992:47ff.; Levin and Rappaport Hovav 1998; Lieber 1980, 2004). To take a concrete example, consider the suffix *–y* in English, as illustrated in (1).

(1) bush-y, geek-y, computer-y, ditz-y, fish-y, meat-y, game-y, beef-y, bush-y, dork-y, geek-y, leather-y, paper-y…

While it is trivial to state the structural conditions for *–y* suffixation (apparently it suffixes to nouns to create adjectives), it is much more difficult to state coherently what the lexical semantic impact of the suffix is (see Chapter 2 for some very preliminary discussion). Levin and Rappaport Hovav (1998) and Lieber (2004) suggest that the neglect of the semantic side of word-formation operations is due to the relative underdevelopment of lexical semantics as a discipline relative to syntax and morphology. At the same time, however, these authors observe that much progress has been made in lexical semantics over the last twenty years, leading to the development of theories that can serve as the point of departure for the study of the semantics of word formation operations.

This dissertation contributes to this nascent area of inquiry by taking the discussion in a direction it has rarely been taken. While there is work drawing on decompositional theories of lexical semantics to describe the semantic impact of word formation operations (Carter 1976, 1978; Dowty 1978, 1979; Jackendoff 1975, 1990; Pinker 1989; Levin and Rappaport Hovav 1998; Lieber 1998, 2004; Booij and Lieber 2004), the discussion has not yet generally moved beyond questions of how best to describe the facts of particular phenomena.[1] Two kinds of questions have gone largely unexplored. The first of these is a typological question and one of simply what the facts are: namely what do, and in particular what do word formation operations *not* do, from a semantic perspective? Assuming it to be the case that there are indeed semantic operations that word formation rules logically could, but don't do, a deeper explanatory question is suggested: what is it about the nature of the human linguistic capacity that certain operations are simply not performed by word formation operations? These two questions are summarized in (2).

(2) a. From a semantic perspective, what do word formation operations do and what don't they do?

b. Why don't word formation operations do the things they don't do?

These kinds of questions, I believe, are likely to yield interesting insights into the nature of the semantics of word formation, and ultimately into the nature of language itself.

More specifically, in the context of the questions posed in (2), in the chapters that follow I focus on a single constraint on the semantics of word formation which I show to have far-reaching empirical consequences. The constraint is what I call the *Monotonicity Hypothesis* (MH) and at a first, informal approximation (originally proposed in Kiparsky

[1]An exception to this trend is Rappaport Hovav and Levin (1998), which explicitly assumes the MH, discussed below, and draws empirical consequences from it. Questions about possible and impossible word formation operations are also broached in the work of Carter (1976, 1978), Kiparsky (1982), Talmy (1985), Bybee (1985), Levin and Rappaport Hovav (1998), and Hale and Keyser (2002) among others. I believe this kind of work is exceptional, however. Generally, I think that the literature in this area has focused much more on what Chomsky (1964:Chapter 2) called descriptive, rather than explanatory adequacy. In fact, Jackendoff (1990:3) is unapologetic about this, noting, rightly I believe, that the latter can only come when a theory meeting the former criterion has been developed. The same kind of observation is made, in essence, by Levin and Rappaport Hovav (1998). My observations, then, should not be taken as criticism of this prior work, but instead as recognition that this program has achieved much and has made it possible to begin to ask the deeper questions I pose here, taking this prior work as a point of departure.

1982), has it as in (3) that word formation operations can add meaning to the lexeme they operate on, but can never remove meaning.

(3) **Monotonicity Hypothesis** (informal)
Word-formation operations add, but do not remove, meaning.

The MH as stated in (3) is vague almost to the point of being contentless, owing in large measure to the question of what *meaning* is. In Chapter 2 I flesh the informal version of the MH in (3) out in a decompositional theory of word meaning, adding content such that it leads to a number of predictions. For the discussion in this introductory chapter, however, this informal statement suffices.

To understand more concretely the issues of concern, consider the following example due to Kiparsky (1982:8).

(4) a. pig
'pig animal'
b. pig-let
'baby pig animal'

The word *pig* in English refers to pig animals (or the set of pig animals) and is underspecified with respect to the age and maturity of the animal in question. Because of this, the word can be used to refer to a young pig or an old pig, a small pig or a large pig. All that matters for an English speaker to felicitously use the word *pig* is that the entity referred to by the word be a pig animal. The word *piglet*, however, is more specific with respect to the kind of entity it can be used to refer to—it makes no sense, for example, to talk about an #*adult piglet*. For the word to be used felicitously, it must refer to an immature pig. Correlating with this difference in meaning is a difference in morphology. While the word *pig* is morphologically simple, the word *piglet* is complex and derived from it. Part of the function of the derivation of *piglet* from *pig* is to alter the meaning of the latter, adding the specification of immaturity.

In contrast to the pair in (4), consider the pair in (5), consisting of the attested English word *calf* in (5a), lexicalized with the specification that its referent is immature, and the unattested derived word **calf-bung* with less specific meaning in (5b).

(5) a. calf
 'baby cow animal'
 b. *calf-bung
 'cow animal'

The English word *calf* is semantically to *cow* what *piglet* is to *pig*, namely, *calf* names the immature variety of *cow*, as evidenced by the fact that one cannot speak of an *#adult calf*. In contrast to *piglet*, however, the word *calf* is not derived from *cow*. Instead, there simply exists in English a ready-made word with the immature meaning. This in itself is not noteworthy. What *is* noteworthy, however, is the fact, observed by Kiparsky (1982), that there are no derivations like the hypothetical one in (5b) that derive from a noun with inherent immature meaning the noun naming the entity of underspecified maturity. More specifically, as conjectured by Kiparsky "... a derivational process can *add* but not eliminate some element of meaning in a word" (Kiparsky 1982:8). As previously stated, I call this idea the MH. Its empirical evaluation is the central goal of this dissertation.

The MH is far from being a unique idea—instead, it seems to be observed in one way or another by almost all theories of word formation.[2] Indeed, Dowty, in a recent paper, matter-of-factly remarks that monotonicity is a constraint on semantic composition in linguists' semantic representations.

> ... [in] formation rules for the semantic representations of linguists, complex expressions are built up monotonically; the expression produced at any step contains as sub-parts all the expressions produced at earlier steps. (Dowty 2006:20)

[2]Some have even proposed extending something like the MH into the domain of the semantics of inflectional morphology, as in the work of Kuryłowicz (1964) and Garrett (2006). I do not weight in here on whether its assumption in that domain is warranted, but believe that this is an area for interesting future research.

Despite this common assumption, usually implicit though sometimes explicit (Marchand 1964; Ljung 1977; Kiparsky 1982; Rappaport Hovav and Levin 1998; Koontz-Garboden 2005, 2006c, 2007; Dowty 2006), the MH has been the subject of no systematic investigation, generally treated instead as an implicit methodological operating assumption. Further, even when explicitly assumed, it is *assumed*, its validity never having been explicitly argued for. In this dissertation I treat the MH as an empirically falsifiable hypothesis about the semantic component of word formation operations, investigating its consequences to determine if it indeed holds as a property of word formation operations.

In the chapters that follow, I take both a language specific and broad crosslinguistic approach to investigation of the MH focusing on a particular empirical domain—the domain of states and changes of state. Since the early days of generative grammar going back at least to Lakoff (1965) it has often been observed that there are words naming simple states, changes into states, and causative changes into states. This is illustrated by the data from Quechua in (6).

(6) Quechua (Van Valin 2005:41, due to Weber 1989)

a. hatun
'big'

b. hatun-ya:
'become big'

c. hatun-ya:-chi
'cause to become big'

In languages like Quechua, there are morphologically simple words like *hatun* naming a state of bigness (6a). From this word, via a derivational operation marked by the suffix *–ya:* can be derived a word naming a change into a state (6b). Finally, as shown in (6c), there is an additional derivational operation in Quechua marked by *–chi* that derives a word naming a causative change into a state of bigness from the word naming the simple change of state. In decompositional theories of word meaning, common in work in lexical semantics whether carried out from a lexicalist or a non-lexicalist perspective, words with meanings like those in (6) are often given representations like those in (7) (ignoring theory-particular variations, a matter I take up in Chapter 2).

(7) Common decompositional representations of states and changes of state (COS; Lakoff 1965 and many others)

a. state: $\lambda x[\phi(\mathrm{x})]$

b. non-causative COS: $\lambda x[BECOME\ \phi(x)]$

c. causative COS: $\lambda x \lambda y[y\ CAUSE\ BECOME\ \phi(x)]$

Data like those from Quechua in (6), then, are commonly cited as support for decompositional representations like the ones in (7), with the idea being that what derivational operations do is to mark the addition of decompositional operators, consistent with the more formal implementation of the MH that I argue for in Chapter 2 whereby derivational operations can add, but never remove, decompositional operators like CAUSE and BECOME. In Quechua, then, the idea is that *–ya:* derives an inchoative verb from a state denoting word via addition of a BECOME operator, the operator signaling a change into a state. The suffix *–chi*, for its part, derives a causative verb from an inchoative verb via addition of a CAUSE operator, the operator responsible for causative lexical semantics. A rather obvious question, though, that has never been systematically considered in the literature, is whether there might exist derivational operations that rather than adding operators, like the Quechua *–ya:* and *–chi*, instead remove them. Such derivational operations, expected to be empirically attested if the MH does not hold of the semantics of word-formation, are illustrated by the hypothetical anti-Quechua in (8).

(8) Anti-Quechua

a. hatun
$\lambda x \lambda y[y\ CAUSE\ BECOME\ big(x)]$

b. hatun-bung
$\lambda x[BECOME\ big(x)]$

c. hatun-bung-bang
$\lambda x[big(x)]$

In the hypothetical anti-Quechua language, the morphologically simple *hatun* rather than naming a state of bigness, names a causative change into a state of bigness. From this is derived, via a derivational operation that deletes a CAUSE operator, a morphologically complex word naming a change into a state of bigness (8b). Yet another derivational operation deleting the BECOME operator derives the morphologically complex word in (8c) naming a simple state of bigness. The question I investigate in this dissertation is whether derivational operations like the ones illustrated in (8) for the hypothetical anti-Quechua are empirically attested. The MH predicts that they are not. In the chapters that follow, I investigate in detail on the basis of data from a diverse array of languages the extent to which the predictions of the MH are correct. Although the MH faces a number of challenges in the domain of states and changes of state, detailed analysis shows that it does indeed seem to hold in a very strong way. The main theoretical contribution of this dissertation, then, is to show on the basis of empirical argumentation that the MH is a universal of the semantics of word formation and has consequences for the kinds of word formation operations found in natural language. This, I suggest, is a welcome result, given the widespread assumption of something like the MH across otherwise very different theoretical frameworks.

1.2 Outline of the dissertation

The dissertation is divided into four parts. Continuing with the first of these, devoted to laying out the MH, in Chapter 2, I clarify my background assumptions in order to make clearer the central claims of the MH. Most importantly, I lay out justification, both empirical and theoretical, for the decompositional formulation of the MH I adopt. With this formulation as background, I discuss the representation of states and changes of state and lay out a number of predictions made by the MH in this domain. The strongest two of these—that words naming states are never derived from words naming changes of state and that words naming intransitive changes of state are never derived from words naming transitive changes of state—are the focus of the core chapters of the dissertation.

Part II investigates the first strong prediction of the MH, that words naming states are never derived from words naming changes of state. I begin in Chapter 3 by noting that not all states are semantically identical, that the differences in their semantic representation lead to differences in the predictions of the MH. Words naming *result states*, states which presuppose the existence of a prior event leading up to the state, are predicted to always be derived from verbs naming the events giving rise to the state. In this way, they contrast with words naming *property concept states*, which presuppose no such prior event, and are thus predicted to never be derived from words naming changes of state.

These more nuanced predictions are then examined, and shown to hold with two apparent exceptions. In Tagalog, it appears that words naming result states are morphologically simple, with words naming changes of state derived from these. Further examination, however, suggests this conclusion to be based on a superficial understanding of the lexical semantics of the words in question. Once investigated in greater detail, the predictions of the MH are borne out. The other apparent counterexample comes from Ulwa, a Misumalpan language in which words naming property concept states appear to be derived from roots naming changes into those states. This observation, unlike the Tagalog case, cannot be shown to be the result of a misunderstanding of the lexical semantics of the words in question. Detailed investigation of the Ulwa case is then undertaken in Chapters 4, 5, and 6, where it is shown that the morphological complexity of the property concept state denoting words is a consequence of the lexical category system of the language, not of a derivation violating the MH. In light of the discussion of the Ulwa facts and the facts in Chapter 3, I conclude that the prediction of the MH that words naming states are never derived from words naming changes of state is indeed borne out.

Having argued in Part II for the validity of the first strong prediction of the MH, in Part III I turn to the second strong prediction of the MH, that words naming noncausative changes of state are never derived from words naming causative changes of state. As I discuss in Chapter 7, this prediction faces a serious challenge from the phenomenon of *anticausativization*, a widely attested kind of derivation that on the surface, seems to perform precisely this kind of derivational operation. Chapter 7 is devoted to laying out the facts of this phenomenon alongside previous analyses of it. On the basis of detailed examination in Chapter 8, I show that contrary to widely held assumptions, it is not the case that this derivation results in the deletion of a CAUSE operator, in violation of the MH. Instead, although intransitive change of state verbs are derived from transitive change of state verbs by this operation, a wide range of data shows that the CAUSE operator is retained in the derivation, in accordance with the prediction of the MH. In this sense, then, derived inchoative verbs do not, in fact, name "non-causative" changes of state—their lexical semantics, I show, is distinctly causative.[3] I go on to develop an analysis of anticausativization that accounts for this and other facts about the phenomenon, by treating anticausativization as a kind of semantic reflexivization operation, building on pioneering work in this area by Haspelmath (1987, 1990) and Chierchia (2004). The conclusion of Part III, then, is that the second strong prediction of the MH, despite appearances to the contrary, is borne out.

I conclude the dissertation in Part IV by moving beyond the empirical domain of states and changes of state, turning attention in Chapter 9 to a host of other phenomena that the MH makes predictions about. These areas, I argue, suggest promising domains for future typological work on the MH, which I believe will shed further light on constraints on the semantics of word formation more broadly. In Chapter 10, I summarize the main findings of the dissertation and offer concluding remarks.

[3]Despite showing this, I persist throughout much of the dissertation in speaking of verbs naming non-causative and causative change of state events. What I ultimately show in Chapter 8 is that while some intransitive verbs naming change of state events are truly non-causative, others are indeed causative, with intransitive change of state verbs that are derived from transitive change of state verbs falling into the latter group.

Chapter 2

Theoretical preliminaries and predictions

2.1 Introduction

In this chapter I lay the theoretical and methodological groundwork for the empirical evaluation of the Monotonicity Hypothesis in the chapters that follow. I begin by clarifying my assumptions about the semantics of word formation and word meaning. On the basis of this discussion, I posit two levels of meaning—a decompositional, more conceptual level of meaning, and a referential, truth-conditional level of meaning, the latter generally the object of model-theoretic analysis. This discussion is taken as a point of departure for empirical exploration of the level of meaning at which a constraint on the semantics of word formation like the MH might be best formulated—at the level of the referential meanings of words or their conceptual meaning. While highlighting the importance of a theory of referential meaning in evaluation of the MH, I ultimately settle upon a conceptual formulation, whereby it is viewed as a constraint precluding the removal of operators from lexical semantic representations. Given this formulation of the MH, I consider other, higher level principles, like the Principle of Compositionality, that it might independently follow from. Having considered the more formal nature of the MH, I then turn to the practical matter of how it should be empirically tested, in particular considering the role of morphology in determining when a derivational operation has occurred. As a methodological principle, I adopt the stance of Taking Morphology Seriously (due to Paul Kiparsky, p.c.) whereby in the absence of evidence to the contrary overt morphological derivation signals lexical semantic derivation. I go on to discuss consequences of this position. Finally, I turn to the lexical semantic representation of states and changes of state. Given these, the earlier formulation of the MH, and the proposed assumptions about the nature of semantic and morphological derivation, I derive a number of predictions whose evaluation is the focus of the chapters that follow.

2.2 On word meaning and the semantics of word formation

The MH is a hypothesis about the nature of word meaning and how derivational operations have an impact on it. A prerequisite, then, for evaluation of the MH is some idea about the nature of the meaning of words and derivational operations on them. In this section I lay out my views on the nature of word meaning and how derivational operations impact it.

The goal of referential theories of meaning like Montague Grammar (Montague 1970, 1973) is to explicate at the level of sentences the relation between sentences and the world such that it can be stated in a coherent fashion what the meaning of a sentence is, where this is typically understood as an answer to the question "what would the world have to be like in order for the sentence to be true". So, from the outset, practitioners of these approaches to the study of meaning are unapologetic about the fact that the goal of analysis is to explain meaning at the level of the sentence, some explicitly observing that in such theories "… there is little to be said about lexical semantics, i.e., word meanings and relations among word meanings" (Dowty *et al.* 1981:12) and that "only in the context of a sentence do words have meaning" (Frege cited in Chierchia and McConnell-Ginet 2000:69ff.). Of course, if meaning is all about truth, since only propositions, named by sentences, can have truth, then this position makes sense. Further, when considered in the context of the Principle of Compositionality, Frege's claim that the meaning of the whole is a function of the meaning of its parts, there is also some explanation for this seemingly radical position. In the words of Dowty *et al.* (1981):

> . . . if our semantics adheres rigorously to the Principle of Compositionality, we can understand why matters of lexical semantics lie somewhat outside the domain of the theory. Since the semantic value of any expression is to be a function of the semantic values of its syntactic constituents, expressions which are syntactically unanalyzable, i.e., basic expressions [=words, AKG], will be treated as semantically unanalyzable as well. (Dowty *et al.* 1981:12)

In light of comments and observations like these, one might reach the conclusion that referential theories of semantics have little to offer the study of word meaning. I believe this position may be somewhat extreme, however, and even if, in the end, the most profitable method of studying lexical semantics turns out not to be strictly from the referential perspective, I still believe that it makes sense to situate the theory of lexical semantics in the context of a theory of reference. Not doing so, as Dowty (1979:98ff.) observes, means running the risk that a decompositional analysis of word meaning is vacuous, since without a theory of reference, one cannot know whether or not the lexical semantic representation of a particular word does or does not have a particular lexical semantic primitive as part of its representation.[1]

The question, ultimately, is one of what the primitives of a referential theory of semantics should be taken to be, and what kinds of phenomena they should seek to explain. Practitioners of such approaches are almost universally interested in how the meanings of words compose to form the meaning of a sentence, taking word meanings to be kinds of "black boxes", which rules of semantic composition have no access to, consistent with the Principle of Compositionality. Dowty (1979) showed, however, that a compositional theory can go deeper than taking words as primitives, actually taking morphemes as primitives and explaining not only how word meanings compose to form sentences, but also how the meanings of morphemes compose to form the meanings of words. It is this approach to the study of word meaning and word formation that I adopt

[1] Viz., the difficulty in the generative semantics (and modern) decompositional literature of establishing that the lexical semantic representation of any particular word has the primitive CAUSE on the basis of paraphrases with the English *cause* (Fodor 1970; McCawley 1978).

here, and in doing so I draw heavily on previous work in this area by Dowty (1978, 1979). In fact, I actually take this work quite seriously, more seriously, some have commented, than seems warranted for a theory based on all of the arcana of 1970s era Montague Grammar, much of which is no longer current in modern formal semantics. Because of this, I offer a brief word of explanation and apology: there is extremely little work that bridges the interface between lexical semantics and compositional semantics. Most researchers tend toward one area or the other, with the result that there is often very little interaction between the two camps. In part because of this, I believe, little progress has been made since Dowty's work on understanding what constraints there are on the semantics of word formation. Dowty's theory, really little more than a formalization of generative semantics in Montagovian terms, remains, in my view, the clearest and most explicit statement about the nature of the semantic component of word formation operations, both before and since his work. Ultimately, laying out a clear and precise theoretical backdrop, I believe, makes more transparent and precise the exploration of the level at which the Monotonicity Hypothesis is best stated, a task I undertake in the section that follows.

As a point of departure for the discussion, then, I begin by laying out Dowty's (1978, 1979) theory of the the semantics of word-formation. This is taken verbatim from Dowty (1979:298-299).

> I. Montague's definitions of a *language L* and its interpretation has these parts:
>
> (L1) a set of names of syntactic categories (or category indices).
>
> (L2) for each syntactic category, the set of *basic expressions* (if any) in that category.
>
> (L3) a set of syntactic rules.
>
> Together, (L1)-(L3) determine recursively
>
> (L4) the set of well-formed expressions (both basic and derived) in each

category of *L*.

The *interpretation* of *L* (which may be induced by translation into an interpreted intensional logic) consists of

(L5) an interpretation (translation) for each basic expression of *L*.

(L6) an interpretation rule (translation rule) corresponding to each syntactic rule in (L3).

Together, (L5) and (L6) determine recursively

(L7) an interpretation for each of the well-formed expressions in (L4).

II. A *lexical component W* for *L* is formally defined as a language independent of *L* but has certain parts in common with *L*. *W* consists of

(W1) a set of names of syntactic categories of *W*. (W1)=(L1)

(W2) a set of basic expressions for each category. (W2)=(L2)

(W3) a set of *lexical rules*. These are formally defined just as syntactic rules were defined in UG. (W3)≠(L3) and may be disjoint from (L3).

Together, (W1)-(W3) recursively determine

(W4) the set of *possible derived words of L* for each syntactic category.

The interpretation for *W* consists of

(W5) an interpretation for each basic expression. (W5)=(L5)

(W6) an interpretation rule (translation rule) corresponding to each lexical rule in (W3).

Together, (W5) and (W6) recursively determine:

(W7) the *derivationally predicted interpretations* of all the possible derived words in (W4).

(Dowty 1979:298-299)

These specifications together lay out what constitutes a language on the traditional Montagovian view, with Dowty's contribution being the extension of this system to the lexicon, laying out what the lexicon is, and of particular importance in the present context, how it can be extended by productive rules of word formation (=lexical rules, see (W3)). The system further specifies how the meanings of the newly derived words (W4) are computed from the meanings of their parts (see (W5) and (W6)). In essence, the lexicon, on this view, is treated as a generative system whose abstract nature differs little from the syntax and semantics of the language,[2] with the exception that the set of word formation rules (and their translations) is different; nevertheless, the form that they take, i.e., their syntax, is identical to the syntax of the syntactic rules for L, as specified in (W3). Further, word formation on this view is compositional in that each syntactic rule of word formation is accompanied by a rule stating what the meaning of the syntactic rule is.

To see how Dowty's (1978, 1979) proposal for a lexicon and the semantics of word formation plays out in a particular instance, consider his *inchoative rule*, which derives intransitive COS verbs from adjectives in English (Dowty 1979).

(1) Dowty's (1979:307) inchoative rule

a. syntactic rule: If $\alpha \in P_{ADJ}$, then $F_{inch}(\alpha) \in P_{IV}$ where $F_{inch}(\alpha)=\alpha$+en if α

[2] This kind of view of the lexicon as much more than the locus of exceptionality in some sense antedates later discussions in the more conceptualist oriented literature on lexical semantics (Kiparsky 1982; Guerssel *et al.* 1985; Hale and Keyser 1987; Pinker 1989; Jackendoff 1990; Levin 1993; Levin and Rappaport Hovav 1995; Kiparsky 1997).

ends in a non-nasal obstruent, α otherwise.

b. translation: $F_{inch}(\alpha)$ translates into: $\lambda x[BECOME\ \alpha'(x)]$

What the rule in (1) says is that given *red*, a member of the set of basic expressions of category adjective (with a translation $\lambda x[red'(x)]$), (1) derives *redden*, a member of the set of derived words of category intransitive verb with a translation $\lambda x[BECOME\ red'(x)]$.

As illustrated for Dowty's *inchoative rule*, like the set of *basic expressions* of the language (L2), each newly derived word (W4) is translated into an intermediate logical language, for Montague (1973) *intensional logic*, which is in turn interpreted model-theoretically. Translation of the object language (e.g., English) into an intermediate logical language that is only later interpreted in a model is generally claimed to be a useful, but unnecessary, middle step for deriving the truth conditions of a sentence (Montague 1973:23). An alternative view, however, would be to take this intermediate logical language more seriously, as a way of integrating the model-theoretic approach with the work in the lexical semantic tradition that commonly assumes a kind of augmented logical language for decompositional analysis in order to capture regular semantic relationships across the lexicon (Lakoff 1965; Foley and Van Valin 1984; Pinker 1989; Jackendoff 1990; Levin and Rappaport Hovav 1995, 2005; Kiparsky 1997; Wunderlich 1997b; Bierwisch 2002; Lieber 2004). In fact, this seems to be what Dowty (1979) has in mind in giving model-theoretic interpretations to the kinds of decompositional operators current in the generative semantics tradition of the time, and independent of this, there are arguments from other empirical domains, at least in sentential semantics, for taking the logical representational language seriously (Potts 2005:§3.7). Again, returning to the *inchoative rule*, Dowty makes use of the decompositional operator BECOME, common from the generative semantics and modern lexical semantics literature, in order to represent the bit of meaning that differentiates state-denoting adjectives from the change of state (COS) denoting verbs derived from them. Dowty's contribution, however, is to go beyond the observation that there is a regular semantic relationship between adjectives and COS verbs derived from them to actually spelling out a model-theoretic interpretation for the BECOME operator (drawing on von Wright 1963, 1968). In this way, I believe, Dowty is able to make it clear what it means for a decompositional operator to be present/absent from a word's lexical semantic representation. This is also the kind of program Krifka (1998) seems to have in mind when he says:

> We can make use of the techniques developed in the model-theoretic tradition and assume that expressions are interpreted by elements of conceptual structures that in turn are related to 'real' entities by some extra-linguistic matching. This is how I would like to understand the algebraic structures discussed below: As attempts to capture certain properties of the way we see the world, not as attempts to describe the world how it is. (Krifka 1998:198)

The idea, then, is that decompositional representations can be taken, as in most work in the lexical semantics literature, as psychological objects—the meaning of words, but which have interpretations in the world, where these representations can interface with truth-conditional meaning in the context of sentential compositional semantics.[3]

The conclusion is that there are two distinct levels at which word formation rules could have an impact on "meaning". First, there is the level of lexical semantic representation, represented in the Montagovian framework by a logical representation. In order to calculate truth conditions in a model, these lexical semantic representations have interpretations generally as set-theoretic objects, with each of these composing with one another in the formation of the interpreted truth-conditional meaning of a sentence. This, in turn, raises the question at which level of meaning semantic constraints on word formation, like the MH, exist if indeed they exist at all. These could be constraints on representations, or constraints on their set-theoretic interpretations in a model. I address this question in the following section with particular reference to the MH.

2.3 On the locus of the Monotonicity Hypothesis

In light of the dichotomy between lexical semantic representation and model-theoretic interpretation introduced in the previous section, in this section I address the question of the locus of the MH—specifically, whether it constrains lexical semantic representations

[3] I believe this is somewhat similar in spirit to the position laid out in Mohanan *et al.* (1999).

or model-theoretic interpretations. I address this question empirically, showing that the kinds of facts that the MH accounts for cannot be accounted for at the level of interpretations in a model; the generalization the MH is meant to capture cannot be made, I show, without reference to the kinds of lexical semantic representations common in work on lexical semantics and that serve as the (interpreted) translations of words on Dowty's (1978, 1979) approach, as discussed above. This finding, in turn, leads to a more concrete formulation of the MH in terms of lexical decompositional representations.

As discussed in the previous chapter, I take as a point of departure for the MH Kiparsky's conjecture about the semantic outcome of word formation operations.

> ... a derivational process can *add* but not eliminate some element of meaning in a word. (Kiparsky 1982:8)

Now, in light of the discussion in the previous section, it is not entirely clear what Kiparsky might intend by "meaning" in this context. Some clarification is suggested, however, by Marchand, who Kiparsky cites as one of the sources for his thinking on the matter. Working in the context of zero-derived denominal verb formation in English (e.g., *box*–N/*box*–V), Marchand proposes the following as one of his criteria for determining direction of derivation in such zero-derived pairs.

> The word that for its analysis is dependent on the content of the other pair member is necessarily the derivative. (Marchand 1964:12)

Kiparsky takes as an example to illustrate his and Marchand's observation the formation of augmentatives and diminutives, observing the following:

> ... although languages commonly have augmentative or diminutive affixes (e.g., *pig+let*), they do not have affixes which neutralize inherent augmentative or diminutive meanings in lexical items (e.g., a hypothetical suffix **–bung* such that **calf+bung* means 'bovine animal'). (Kiparsky 1982:8)

In terms of model-theoretic interpretation, what is going on with augmentatives and diminutives like *pig*/*pig+let* is that the derivational operation restricts the denotation of the derived lexeme as compared to the one that it is derived from. That is, while all of the objects in the denotation of *piglet* are also in the denotation of *pig*, as in (2), the reverse is not the case—not all of the objects in the denotation of *pig* are also in the denotation of *piglet*. Less formally, the observation is that while all *piglets* are *pigs*, it is not the case that all *pigs* are *piglets*.

(2) $[\![pig + let]\!] \subset [\![pig]\!]$

This kind of relationship suggests that one way of envisioning Kiparsky's "derivational operations only *add* meaning" conjecture is as restriction of the denotation, so that the denotation of the derived lexeme is always included in the denotation of the lexeme from which it is derived. This idea, which will ultimately be rejected on empirical grounds, is stated in (3).[4]

(3) The MH model-theoretically (to be rejected)
Word formation operations restrict denotations.

The intuition behind stating the MH as in (3) would be that, as illustrated by the diminutive example, if a word formation operation Z operated on a lexeme A to yield a derived lexeme B, the denotation of B is included in the denotation of A. This is summarized in (4).

(4) For any WF operation Z involving a lexeme B derived from a lexeme A, $[\![B]\!] \subset [\![A]\!]$.

Despite the fact that (3) with the consequence in (4) has much appeal, it is simply

[4] As Cleo Condoravdi (p.c.) points out, it would actually be quite surprising if restriction were the only kind of model-theoretic operation in word formation operations, given that non-restrictive modification clearly exists at the level of sentential semantics, as with non-intersective adjective/noun modification, for example (on which see Siegel 1976 and Larson 1999 for overviews). This raises a larger research question: to what extent are the kinds of model-theoretic operations in semantic composition at the sentence level also observed in word formation, and vice versa? Surprisingly, this question, so far as I can tell, has not been investigated, despite the fact that certain theories, e.g., lexicalist versus non-lexicalist theories of syntax, would seem to make quite different predictions about what should or should not be the case. This seems like an area for interesting and urgent future research that could have important implications for theories of the syntax/semantics/lexicon interface.

incorrect—one needn't look farther than English to find derivational operations that violate (3). In fact, derivational operations are not uniform in terms of the set-theoretic impact on the denotation of the input lexeme. Without looking beyond English, derivational operations can be found, that (a) restrict the denotation of the input lexeme, (b) completely change the kinds of objects in the denotation, (c) intersect the denotation of the input lexeme with some other set, and (d) map the denotation of the input lexeme to its complement. Based on these findings, I conclude that model-theoretic interpretation is not the right level of meaning at which to search for constraints on the semantics of word formation. The question remains, however, whether there exist any interesting generalizations at the level of conceptual meaning. I suggest that indeed, there are. First, however, I briefly lay out the empirical arguments demonstrating that (3) is not a constraint on derivational operations, and that indeed, set-theoretically, there are many different kinds of derivational operations, which I almost certainly do not exhaust with this superficial survey of English derivational morphology.

2.3.1 Intersection

Contrary to the claim of (3), there are derivational operations that rather than restricting the denotation of the derived form as compared to the form from which it is derived, alter it by partially intersecting it with some other set. The derivational operation marked by *–y* in English that derives adjectives from nouns, as exemplified by the data in (5), is such an operation.

(5) a. fish, meat, game, beef, bush, dork, geek, leather, paper, ...
    b. fish-y, meat-y, game-y, beef-y, bush-y, dork-y, geek-y, leather-y, paper-y...

Descriptively speaking, what the derivation marked by *–y* seems to do is to derive from a noun an adjective meaning something like "having salient properties of noun". Contrary to the prediction of (3), the derivation does not restrict the denotation of the noun—indeed, there are many things that can be described as *geeky*, *leathery*, *meaty*, etc. which are not in fact *geeks*, *leather*, or *meat*, as evidenced by the data in (6).

(6) a. Brittney Spears' behavior on Saturday was decidedly geeky.
b. So tell me...which cigars are dominated by a leathery flavor!?? (Google groups)
c. I've also had brain carnitas in southern cali, very good stuff. Like a meaty tofu, it absorbs all the flavors of the sauce. (Google groups)

While the behavior of Brittney Spears may have been on a particular occasion in the denotation of *geeky*, her behavior is not a *geek* (6a). Similarly, the example in (6b) illustrates the fact that something can be *leathery*, e.g. the flavor of a cigar, without itself being *leather*. The example in (6c) illustrates the fact that tofu can be *meaty*, despite the fact that tofu is definitively not *meat*. These examples show, then, that something can be in the denotation of *N-y* without being in the denotation of *N*.

From this, one might conclude that the denotation of a *N-y* adjective is a superset of the denotation of the noun from which it is derived, in direct violation of (3). While this derivation does clearly violate (3), as already evidenced by the facts in (6), the situation is a bit more complicated, since it turns out that there are also objects that can be in the denotation of *N* without also being in the denotation of *N-y*. It is not simply the case that the denotation of *N-y* adjectives includes the denotation of the noun from which they are derived. Instead, it seems to be the case that the two intersect one another only partially. What the derivation seems to do, then, is to take the set of entities denoted by the noun and map it to another, different set of entities, some of which are included in the denotation of the noun the adjective is derived from, and some of which are not. To take an example, it is not the case that all meat that is classifiable as *game* is actually *gamey*, as evidenced by the naturally occurring examples in (7).

(7) a. We tried the pepper-crusted elk ($16), and found it as tender as filet mignon, with a colorful, nongamey flavor that was a bit overpowered by the pepper. (Google)
b. I loved the warthog stew's rich beefy texture and slightly sweet, nongamey flavor. (Google)

Similarly, although swordfish is a *fish*, as something to eat, at least some people do not feel it is *fishy* (8). Likewise, there are apparently some *geeks* who believe themselves not to be *geeky* (9).

(8) But as you know I hate—or have hated—fish. Except the nonfishy ones like swordfish steaks. (Google)

(9) I think of myself as a nongeeky geek. (Google)

The observation, then, is that contrary to the prediction of (3), the word formation operation marked by *–y* does not restrict the denotation of the lexeme it operates on—instead, its model-theoretic effect is to map the denotation of the nominal lexeme into a different denotation which partially intersects the denotation of the noun.

2.3.2 The complement

There are also word formation operations whose set-theoretic impact is to map the denotation of a lexeme to its complement in the denotation of the derived lexeme, in violation of (3). Such would be the case for the derivation marked by the affix *non–* that derives adjectives from other adjectives, e.g. *non-trivial* from *trivial*.

This is perhaps also the case for certain uses of *un–*. For example, on Dowty's (1979:360) decompositional analysis of adjectival *un–* prefixation, its decompositional effect is to add a negation operator, and its model-theoretic impact, therefore, will be to map the denotation of the input adjectival lexeme to its complement.[5]

2.3.3 Different kinds of objects in the denotation

In addition to word formation operations where the denotation of the derived lexeme is an intersection of the denotation of the underived form and some other set, there are also derivations where the objects in the denotations of the derived and underived forms are simply of fundamentally different kinds. In such cases (3), again, is violated, and

[5]This may be oversimplifying the situation with *un–*, however. Horn (2005) in particular shows that this prefix is impressively complex both semantically and pragmatically.

again, one needn't look beyond English to find such word formation operations. In fact, denominal verb formation (Clark and Clark 1979), the phenomenon from which precursors to the MH arise (Marchand 1964; Kiparsky 1982) and which is exemplified by the data in (10) (Levin 1993:120ff.), is transparently such a phenomenon.[6]

(10) asphault, bait, blanket, blindfold, board, bread, brick, bridle, bronze, butter, buttonhole, cap, carpet, caulk, archive, bag, bank, beach, bed, bench, berth, billet, bin, bottle, box, cage, can, ...

What the forms in (10) have in common is that they can all be used both as nouns and as verbs, as illustrated for *box* in (11a), a nominal use, and (11b), a verbal use.

(11) a. Kim put the books in a box.
 b. Kim boxed the books.

Regardless of the derivational relationship between the noun/verb uses of the forms in (10), whether the noun is basic and the verb is derived or vice versa, the denotations of the nouns and of the verbs are of fundamentally different kinds, in a way such that (3) is not met. While the noun names a set of entities, the (saturated) verb names a set of events. The elements contained in the denotations of the noun and the verb, then, are fundamentally different from one another, and this kind of derivation, therefore, also violates (3), since under these circumstances it cannot be the case that the denotation of the derived lexeme is included in the denotation of the lexeme from which it is derived, regardless of direction of derivation.

2.3.4 The MH as constraining operations on lexical semantic representations

Without denying the importance of referential theories of meaning to the analysis of propositions, the discussion in the previous section suggests that reference is not the

[6]There are different kinds of denominal verbs; the type illustrated in (10) has the meaning "put X on/in (something)" (Levin 1993:121). See Clark and Clark (1979) for an overview.

most fruitful place to look for constraints on the semantics of word formation. In referential terms, we find at least word formation operations that not only restrict the denotation of the derived lexeme as compared to the lexeme it is derived from, but also word formation operations that result in denotations of completely different kinds of entities and word formation operations that result in the intersection of the denotation of the original lexeme with some other set. An additional common type of word formation operation is one which maps the denotation of a lexeme to its complement (negation).

If referential meaning is not the right place to look for constraints on the semantics of word formation, what can be said about conceptual meaning, the level treated by decompositional representations in a wide variety of lexical semantic and syntactic literature? In fact, I believe that at the level of the conceptual meaning of words, there is indeed an interesting generalization to be made about semantically possible and impossible word formation operations. Specifically, assuming the kinds of lexical decompositional representation that are mainstream in work on lexical semantics and syntax (Lakoff 1965; Dowty 1979; Foley and Van Valin 1984; Bierwisch 1986; Pinker 1989; Jackendoff 1990; Levin and Rappaport Hovav 1995; Wunderlich 1997b; Kiparsky 2001; Piñón 2001a; Hale and Keyser 2002; Baker 2003; Embick 2004; Lin 2004; Rothstein 2004), a plausible constraint on the semantics of word formation operations is the one in (12).

(12) The Monotonicity Hypothesis
Word formation operations do not remove operators from lexical semantic representations.

The idea expressed by (12) is that word formation operations, if they alter the meaning of words at all, do so only by adding decompositional operators, never by removing them. Like (3), I believe this is a way of restating Marchand's and Kiparsky's conjectures in a clearer and more falsifiable way. Independent of Marchand and Kiparsky, this is an assumption that seems to be relatively widely adhered to in decompositional approaches to lexical meaning, usually implicitly,[7] though on occasion explicitly, as in Rappaport Hovav and Levin (1998).

[7] See the discussion in §2.5.2.

There are several properties that the MH as stated as a constraint on conceptual meaning has that make it attractive when compared to the MH as in (3), where it was stated on denotations. First, decompositional operators can have varying impact on the denotations of the words whose representational meaning they are a part of, so that it is plausible that derivational operations only ever add operators, at the same time that the impact of word formation operations on the denotations of words could be quite heterogeneous. From the very small sampling observed above, there are at least word formation operations that restrict the size of the denotation, intersect it with another set, map it to its complement, and change entirely the kinds of objects in the denotation.[8] These are all outcomes that could be effected by addition of a decompositional operator in a word's decompositional representation, and indeed, the denotational outcome, while not the place to look for constraints on the semantics of word formation operations, does help to provide evidence for the decompositional structure. This is because the decompostional operators are taken to have model-theoretic interpretations as in Dowty (1979), which make it possible to test empirically for their presence/absence in the lexical semantic representations of particular words.

To take a simple example from above, despite the fact that *un–* prefixation, as in the pair *happy*/*unhappy*, does not restrict the denotation of the lexeme it operates on, it is still clearly in compliance with (12), since the decompositional effect of this word formation operation is to add a negation marker to the lexical semantic representation of the lexeme it operates on, as illustrated in (13).

[8]One kind of set-theoretic operation for which I have been unable to find a clear example of derivational rule, at least in English, is expansion, i.e., a rule whose effect is to map the denotation of the basic lexeme into some superset of it in the denotation of the derived lexeme. The anti-*calf* operation described by Kiparsky (1982) would be just such an operation. As Cleo Condoravdi (p.c.) points out, such operations are indeed found in sentential semantics, with disjunction, as illustrated in (i), a prime example.

(i) a. Kim will eat the apple.
    b. Kim will eat the apple or the orange.

When compared to (ia), the disjunction in (ib) represents an expansion of the set of things that Kim will eat. Whether this represents a true gap in the typology of set-theoretic operations in word formation and if so, how it follows from the representational implementation of the MH, if at all, is a matter I leave for future investigation. Further, if it is indeed the case that sentential semantics and the semantics of word formation differ in this way, this is also something that merits attention.

(13) a. $[\![happy]\!] = \lambda x \lambda s[happy(s, x)]$
b. $[\![unhappy]\!] = \lambda x \lambda s[\neg happy(s, x)]$

It is trivial to show that *unhappy* has a negation operator as part of its lexical semantic operation, since the truth conditions of a sentence headed by *happy*, as in (14a) are different from the truth conditions of a sentence headed by *unhappy* as in (14b) in exactly the ways expected given the presence of a negation operator.

(14) a. Kim is happy.
b. Kim is unhappy.

That is, (14a) is true just in case Kim is happy, while (14b) is true just in case it is *not* the case that Kim is happy, showing that there must be a negation operator in the lexical semantic representation of *unhappy*. The upshot of this, then, is that while the word formation operation marked by *un–* does not restrict the denotation of the lexeme it prefixes to, it does result in the addition of a decompositional operator, namely negation, consistent with the decompositional implementation of the MH as outlined in (13).

In addition to the considerations discussed above, it seems unavoidable that word-formation operations, the kinds of objects that the MH regardless of its form is meant to be a hypothesis about, are not operations on sets of real-world entities, despite the fact that they clearly have consequences for the denotations of words. For example, in order to derive *meaty* from *meat*, one needn't know in advance anything about the sets of entities in the real world that these words denote. This is, in fact, one of the things that a wug-test might be taken to demonstrate—that certain kinds of word formation operations have a psychological reality independent of the lexemes that they operate on. That being the case, it would seem to make sense that constraints on such objects should be constraints not at the level of model-theoretic interpretation, but instead at a more representational level, like lexical decompositions.

In the remainder of the dissertation, I examine a particular domain in detail to determine, at least for that domain, whether counterevidence to the hypothesis as stated in (14) can be discerned. With this in mind, I turn in the next section to consideration of higher-level principles from which the MH might reasonably follow, without further stipulation.

2.4 The MH in broader context

The question I address in this section is how the MH as stated in (12) could be implemented formally given the assumptions laid out in §2.2 about the nature of word formation.[9]

The first relevant observation is that for at least some people, monotonicity actually forms part of the Principle of Compositionality. This is the case for Cann (1993), for example, who remarks:

> ... it is a general property of human languages that all the sub-expressions of a grammatically well-formed phrase have a role to play in the interpretation of a sentence ... Semantic rules should, therefore, not be allowed to delete meanings during the derivation of the meaning of a composite expression. (Cann 1993:4)

Based on this thinking Cann goes on to give the formulation of the Principle of Compositionality in (15).

(15) The principle of compositionality according to Cann (1993:4)
The meaning of an expression is a monotonic function of the meaning of its parts and the way they are put together.

Assuming that the Principle applies in the same way to the interpretations not only of syntactic rules, but of productive lexical rules, as laid out in §2.2 following Dowty (1978, 1979), the MH is immediately captured, perhaps stipulated, by a formulation of the Principle of Compositionality as in (15).

[9]Although my assumptions throughout are generally lexicalist, it is worth mentioning, as I suggest further below, that the MH is independent of the lexicalism issue. Audience members at a presentation of some of this material at NELS-37 in Urbana-Champaign (Koontz-Garboden 2006b), for example, were insistent that the MH would follow from Chomsky's (2005:11) "no-tampering" condition, assuming that this condition was incorporated into a non-lexicalist theory of syntax.

Assuming, though, that the MH is not built directly in to the Principle of Compositionality as in Cann (1993), it still seems that the MH follows from independently desirable properties of semantic composition. Principal among these is what Dowty (2006) calls "the context-free requirement", the idea that semantic composition should be context-free. This, again, ties into the Principle of Compositionality, at least to Montague's (1970, 1973) implementation of it as a homomorphism between syntax and semantics. The idea is that each syntactic operation on syntactic elements is interpreted by a unique semantic operation on the meanings of those elements that tells how to interpret the result of the syntactic operation. As Dowty (2006:11) points out, the homomorphism model of compositionality has as a consequence that "... all semantic interpretation [is] "strictly local"—it says in effect that the meaning of any syntactic construction is determined by the meanings of its *immediate* constituents and *only* by those meanings ..." This idea is stated slightly differently in (16), again taken from Dowty (2006).[10]

(16) Dowty's (2006:19) "context-free constraint"
When you put together meanings α and β by some semantic operation G, $G(\alpha,\beta)$ may depend only on what α and β are, each "taken as a whole", but may not depend on the meanings that α and β were formed from by earlier semantic operations.

As Dowty himself points out, this discussion raises the question what "a meaning" is. As I have discussed above, I take "meanings", at least of words, to be formulae of a well-defined lexical decompositional language, where the decompositions have model-theoretic interpretations, as in Dowty (1979) and as discussed above.[11] With these assumptions, the context-free semantics desideratum entails a context-free syntax for the

[10] As is made particularly clear in Cresswell (1985) and Chierchia (1989), the semantic composition of sentences with propositional attitude verbs like *believe* causes acute problems for this idea. Dowty (2006) does not address such data. Even if Dowty's constraint has to be given up for sentential compositional semantics, however, it is not at all clear that it couldn't be retained as a constraint on the semantics of word-formation operations. This may be an interesting and important way in which sentential and lexical semantics differ.

[11] Again, though, the conclusions reached in this section do not depend on the decompositional structures being interpreted model-theoretically. Although I believe it is problematic for unrelated reasons, one can still reject this assumption while still accepting my conclusions.

decompositional language, the language that spells out the meanings of words. That is, the rules that put the various primitive elements of decompositional meaning together are context-free. From this, it follows that rules can't see inside the meanings, so couldn't (a) be sensitive to what is inside them, and more importantly (b) couldn't see inside to remove elements.

Consider, then, some of the syntactic rules of the decompositional language. I first specify in (17) the categories of meaningful expressions: sentences, entities, one-place, and two-place predicates.

(17) ME, the set of meaningful expressions includes

a. sentences (type t) with variables ϕ and ψ
b. entities (type e) with variables x, y, etc.
c. one place predicates (type $< e, t >$) with variables P, Q, etc.
d. two place predicates (type $< e, < e, t >>$) with variables $\mathfrak{R}$, etc.

Among the operators that any decompositional language will most likely include are the standard logical operators of conjunction, disjunction, and negation, which form sentences from sentences, as shown in (18).

(18) a. If $\phi \in \mathrm{ME}_t$ and $\psi \in \mathrm{ME}_t$ then $\phi \wedge \psi \in \mathrm{ME}_t$
b. If $\phi \in \mathrm{ME}_t$ and $\psi \in \mathrm{ME}_t$ then $\phi \vee \psi \in \mathrm{ME}_t$
c. If $\phi \in \mathrm{ME}_t$ then $\neg\psi \in \mathrm{ME}_t$

The negation rule in (18c) takes a proposition and negates it to create a new proposition. Among the consequences of the context-free desideratum is that while there can be a rule such as (18c), there could never be a syntactic rule of the decompositional language that did the opposite of (18c), i.e., remove a negation operator. How does this follow? If we think about what the meaning of a proposition is in a referential semantics, i.e., in a system whereby the formula in (18c) has a model-theoretic interpretation, it is commonly thought of as a set of possible worlds. The effect of negating a proposition in these terms is to take one set of possible worlds mapping it into another set of possible worlds (its complement). Once we have this second set, the context-free requirement says that further rules can have no access to how that set was composed—the rule can have access to the nature of this set itself, but it cannot be sensitive to anything about the nature of the set that was operated on by another rule to create it.

In terms of the decompositional representation, this requirement amounts simply to rules having access only to the highest level of the tree, where the decompositional representations are treated as tree structures, as in Wunderlich's (1997a:104) and Bierwisch's (1986, 2002) SF representations or Jackendoff's (1990:22ff.; 1993:18) X-bar semantics, where lexical decompositions are labeled bracket structures. In this way, the negation of a proposition can be represented not only as in (19a), but as in (19b).

(19) a. $[_t \neg \phi]$

b.
$$\begin{array}{c} t \\ \diagup \quad \diagdown \\ \neg \quad \phi_t \end{array}$$

As already discussed, negation takes a proposition as an argument, creating a new proposition, e.g., in (19), it takes a proposition ϕ as an argument creating a new proposition. Any further operations on a tree like the one in (19b), however, if the context-free desideratum is adhered to, will only have access to the newly created proposition; no function will have access either to the negation function or to the proposition ϕ. That is, there could be no function G that could operate on (19), seeing inside of the new proposition and remove the negation operator.

(20) An operation in violation of the MH

$$\begin{array}{l} \quad\ \phi_t \\ \ \diagup \quad \diagdown \\ G \qquad t \\ \qquad\ \diagup \quad \diagdown \\ \qquad \neg \quad \phi_t \end{array}$$

Any operator has access only to the information that its argument is a proposition—it cannot know, if the operation is consistent with Dowty's context-free dictum, that it is a proposition composed of another proposition and a negation operator.

The decompositional operators of primary interest in this dissertation, CAUSE and

BECOME, are syntactically no different from an operator like the negation operator illustrated above—they too create propositions from propositions, as illustrated in (21), following Dowty's (1979) treatment.

(21) a. If $\phi \in ME_t$ then BECOME $\phi \in ME_t$
b. If $\phi \in ME_t$ and $\psi \in ME_t$ then ϕ CAUSE $\psi \in ME_t$

So, in the same way that the context-free desideratum rules out an operation like *G* in (20), which peeks inside of a proposition to see what it was created from, in effect stripping away a negation marker, the context-free desideratum similarly precludes the existence of a function that would do the same with CAUSE, BECOME, or any other decompositional operator.

Dowty's (2006) discussion is focused on laying the groundwork for an empirical evaluation of the Principle of Compositionality, which he argues makes most sense in the context of context-free semantic composition. In the system of lexical rules laid out in §2.2, however, the set of syntactic rules (and their interpretations) and the set of lexical rules (and their interpretations) are distinct, so that it could, in principle, be the case that only the former adhere to the context-free constraint, while the latter do not. Dowty's (2006) discussion sheds no light on his thinking about whether the constraint should or should not apply to both kinds of rules. It seems, however, that the null hypothesis would certainly be that it does hold of lexical rules. Assuming this, then the Monotonicity Hypothesis seems to follow as a consequence. To the extent that empirical evidence can be garnered in favor of this hypothesis, it could in turn perhaps be used as an argument in favor of extending the context-free requirement to productive lexical rules. I leave further consideration of this matter, however, for future research. What I hope to have accomplished in this section is simply to have clarified the nature of the kinds of rules the MH is meant to rule out and what kinds of other formal constraints the MH might reasonably follow from. In the next sections, I turn discussion to the actual empirical evaluation of the hypothesis.

2.5 The role of morphology in evaluation of the MH

Before proceeding in the following chapters, several clarifications must be made about the nature of morphology and its role in and the evaluation of the predictions of the Monotonicity Hypothesis.

2.5.1 The MH and theories of morphology

The MH, as discussed above, is a hypothesis about possible and impossible semantic operations on lexemes as part of word formation rules. The nature of word formation rules, then, might seem like a matter that evaluation of the MH might hinge upon. It turns out, however, that so far as the matters upon which evaluation of the MH rests, I believe most theories agree. Theories of word formation seem to be split along two major axes: (a) whether they adhere to lexicalism (Chomsky 1970) or not (McCawley 1968; Marantz 1997) and (b) whether or not affixes are treated as lexemes (Lieber 1980) or as realizations (Beard 1995) of word formation rules (see Beard 1998 for an overview of this issue).[12] Although my terminology often presupposes a lexicalist and lexeme-based approach to morphology, neither of these assumptions makes any difference in either the predictions or the evaluation of the MH. This is the case because the MH is simply a hypothesis about what kinds of meanings can be derived from what kinds of meanings; it has nothing to say about the structural side of word formation.

Concerning the lexicalist/non-lexicalist divide, whether word formation takes place in the lexicon or in the syntax also makes little difference so far as the MH is concerned—practitioners of both kinds of theories commonly presuppose decompositional representations for the meanings of lexemes and treat, explicitly or implicitly, the semantics of word formation as the alteration of the decompositional representation. This decompositional representation, as discussed above, is the real core assumption upon which the implementation of the MH that I have laid out above rests, and this much is common to both lexicalist and non-lexicalist approaches to word meaning. The claim of the

[12] Stump (2002:1ff.) has an enlightening discussion of differences among theories of inflectional morphology that has inspired, at least in part, the present discussion.

MH is that decompositional operators are never removed from lexical semantic representations. It makes no difference whether these representations are treated as syntactic objects (Pesetsky 1995; Hale and Keyser 2002; Embick 2004; Arad 2005) or lexical ones (Levin and Rappaport Hovav 1995; Kiparsky 1997; Wunderlich 1997b)—the prediction is the same. The question explored is simply whether it is indeed the case that word formation operations add, but do not remove, decompositional operators from a decompositional representation. The meanings in decompositional terms are comparable on both lexicalist and non-lexicalist theories, evaluation of the MH is an empirical matter independent of the issue of lexicalism and something that practitioners of both kinds of theories should be worried about. In my discussion, I will adopt lexicalist parlance, but purely as a matter of convenience; the results do not rely on any assumptions one way or another.

Regarding the divide in the morphology literature between morpheme-based (Lieber 1980) and realizational-based approaches (Aronoff 1994; Beard 1995), again, so far as I can see, the choice of a particular theory has no impact on the MH—there would be ways of incorporating the MH into either kind of theory, e.g., restricting the kinds of meanings that a morpheme can have, on a morpheme based approach, or the nature of rules admitted by a realizational approach. Any theory will have to have a way of dealing with the semantics of productive derivations despite the fact that this aspect of morphology is relatively understudied (though see Jackendoff 1975; Levin and Rappaport Hovav 1998; Lieber 2004). For convenience, I assume that both roots and affixes have lexical entries. In summary, then, although the discussion is laid out in lexicalist and morpheme-based terminology, this is purely for convenience; the core findings of this dissertation hold independent of any particular theory of morphology.

2.5.2 Morphological markedness, derivation, and evaluation of the MH

Of crucial importance in evaluating the empirical validity of the MH, in particular from a typological perspective for languages with which one has only secondary knowledge, is some clear criterion for determining direction of derivation.

One methodological assumption I do make, then, is the assumption that in the absence of compelling evidence to the contrary, for a pair of lexemes sharing a root where one lexeme is morphologically marked and the other is not, the marked is derived from the unmarked. This criterion leads to the conclusion, for example, that for the pairs of lexemes in (22), the ones in (22b) are derived from those in (22a).

(22) Some adjective/deadjectival verb pairs in English (Levin 1993)

a. awake, bright, broad, cheap, coarse, damp, dark, deep, fat, flat, fresh, glad, hard, haste, high, long, less, light, loose, most, neat, quick, ripe, rough, sharp, short, sick, slack, smart, soft, stiff, straight, strong, sweet, taut, thick, tight, tough, weak, wide, worse ...

b. awaken, brighten, broaden, cheapen, coarsen, dampen, darken, deepen, fatten, flatten, freshen, gladden, harden, hasten, heighten, lengthen, lessen, lighten, loosen, moisten, neaten, quicken, ripen, roughen, sharpen, shorten, sicken, slacken, smarten, soften, stiffen, straighten, strengthen, sweeten, tauten, thicken, tighten, toughen, weaken, widen, worsen ...

That is, for a pair of lexemes like *red/redden*, I assume the lexically basic lexeme to be *red*, with *redden* derived from it by a productive derivational operation. This methodological operating principle, stated in (23), I call Taking Morphology Seriously, following use of the phrase (as I understand its meaning) in lectures by Paul Kiparsky.[13]

(23) Taking Morphology Seriously

For a morphologically marked/unmarked pair of lexemes sharing a common root and where at least one of the variants seems to be generated by a productive

[13] The notion of *iconicity* in the functionalist literature (Givón 1984; Bybee 1985; Haiman 1985; Haspelmath 1993) is probably rightly taken as quite similar to (23). The difference, I think, is in my taking (23) to be merely a methodological operating assumption, which can be overridden in the presence of evidence, versus iconicity being taken as a larger-level theoretical principle. For me, (23) has no theoretical status.

The idea of Taking Morphology Seriously, also inspired by Kiparsky, is pursued by Donohue (2004) in the context of a theory of morphosyntactic case. In the context of morphosyntactic case, formulation of the methodological principle would no doubt differ from how I have formulated it in (23), but the idea is basically the same—that morphological markedness asymmetries are not generally accidental, and should not be taken to be, unless this can be explicitly shown to be the case.

derivational process, in the absence of evidence to the contrary, assume the marked is derived from the unmarked, the latter taken to be lexically listed.

The primary consequence of this assumption in the context of the MH is that the meaning of the unmarked lexeme is assumed to be the meaning of the lexeme from which the meaning of the derived lexeme is generated. This assumption, while the most faithful to the morphology, is worth dwelling on a bit more, first as concerns zero and subtractive morphology, and secondly as concerns what has come to be known as "the Root Hypothesis" (Arad 2005).[14]

Regarding subtractive morphology and zero morphemes, it should be noted that the assumption I am making is a methodological one. It does not follow from the MH itself, and the MH does not rule out the existence of either zero morphology, morphemes or processes with zero exponence, or subtractive morphology, a morpheme/morphological operation that results in the removal of some bit of phonological material. The assumption simply puts the burden of proof on showing that in marked/unmarked pairs sharing a common root, the marked variant is not derived from the unmarked, but that contrary to appearance, unmarked is derived from marked. The MH, again, is a hypothesis not about morphology, but about lexical semantics, and morphological spellout is independent of it. Both of these kinds of processes are entirely consistent with the MH, so long as they mark the kinds of word formation operations in compliance with the MH. For example, a subtractive morphological operation would not violate the MH so long as it does not result in the deletion of decompositional operators. Similarly for zero morphology—so long as the zero morpheme does not remove a decompositional operator, the MH is agnostic about the extent to which a zero morpheme should or should not exist. Nevertheless, my *methodological* assumption is that there is a non-trivial relationship between overt morphological derivation and lexical semantic derivation, so that overt morphology can, in the absence of evidence to the contrary, be used as a proxy

[14]In this context, by the "Root Hypothesis", I have in mind a hypothesis about morphology, not necessarily about lexical semantics. The same term has been used in the context of lexical semantic research to make reference to two kinds of meaning, the templatic kind of decompositional meaning I have been discussing above versus the more idiosyncratic bits of meaning, which are believed to reside in a kind of lexical semantic "root" (Levin and Rappaport Hovav 2003; Grimshaw 2005). The discussion that follows has nothing to do with the lexical semantic Root Hypothesis.

for lexical semantic relations, i.e., in order to tell which lexeme is derived from which. Now, if there is compelling evidence that in a morphologically marked/unmarked pair sharing a common root that a zero morphological or subtractive morphological process it at work, this is no problem for the MH, so long as the lexical semantic result of the operation is addition, not deletion of decompositional operators.

Related to the issue of morphological markedness and lexical semantic derivation is the Root Hypothesis, most explicitly discussed by Arad (2005). For pairs like *red/redden* discussed above and other basic/derived lexeme pairs like it, some would assume a more abstract, lowest common denominator root, from which both lexemes are derived, the "unmarked" member by a zero morpheme. This is the case, most clearly, of work in this area by Embick (2004). There are many others that appear to take a similar approach, though less explicitly (Pesetsky 1995; Arad 2003; Doron 2003; Jackson 2005). Such an approach is certainly consistent with the MH, and at least on the surface, there do indeed seem to be languages in which things play out in this way.[15] The primary reason I choose not to adopt it here, however, is because some of the arguments for such an abstract root actually rely on *implicit assumption of the MH* (Pesetsky 1995:73), so assuming such a root prejudges the question.[16] Consider, for example,

[15]Once the facts of these particular languages are examined in more detail, however, I am not sure that they end up supporting these views. Ulwa, discussed in detail in Chapters 5 and 6 might look like such a language on the surface. The evidence presented in Chapter 6 shows, however, that the suffix appearing on state-denoting words, however, does not alter the denotation of the root. This contrasts with the analysis of state-denoting words in English by Embick (2004), as I understand it. So even in languages where there might initially appear to be morphological evidence for the Root Hypothesis, it seems to me that further investigation may suggest, as seems to be the case in Ulwa, that things are not as they initially may appear to be. More importantly, even if languages like Ulwa could be shown to transparently behave in a manner consistent with the Root Hypothesis, I do not believe that this finding ipso facto would provide evidence for the Root Hypothesis in a language like English. Instead, I believe that independent evidence would need to be garnered on a language-by-language basis. This is not generally what adherents of the Root Hypothesis have in mind—instead, for them, evidence in one language is evidence for all languages. I do not adopt this particular approach to linguistic theory. This, however, has nothing to do with the MH, but instead with my own analytical modus operandi. As stated above, the Root Hypothesis is entirely consistent with the MH.

[16]And indeed, Pesetsky (1995:71) admits as much:

> ... there is little way to tell if an apparently simplex word is morphologically complex "behind the scenes," absent some hypotheses about the relation between lexical semantics and morphology that might force such an analysis. (Pesetsky 1995:71)

Indeed, I believe that Pesetsky does have such a hypothesis, the MH, but which remains unarticulated.

Pesetsky's (1995:72ff.) argument from psych verb causative/nominalization pairs like *amuse/amusement*. Pesetsky argues that while transitive *amuse* has a causative meaning akin to 'x cause y to be amused', the nominalization *amusement*, apparently derived from this verb, lacks causative meaning, referring to a state of being amused rather than to a causative event of being amused.[17] Observing these facts, Pesetsky then goes on to ask a telling rhetorical question, following it with an even more telling answer:

> If these nouns are morphologically derived from morphemes pronounced *agitate, annoy, amuse,* and *surprise*, how can apparently related nominals have such noncausative semantics? ... Noncausative derivates of roots $\sqrt{}$amuse and $\sqrt{}$annoy are no surprise [if these roots exist and—AKG] if these roots are noncausative themselves. (Pesetsky 1995:73)

Pesetsky's logic seems to be that derivational operations cannot remove causative semantics; because of this, it must be the case that the non-causative nominalizations and the causative verbs come from some more abstract source that lacks causative meaning—the root. The assumption that Pesetsky is drawing on, of course, is precisely the hypothesis under investigation in this dissertation, the Monotonicity Hypothesis, which is apparently so deeply ingrained in certain circles that its assumption goes unnoticed.

Arguments for the Root Hypothesis like the one above, then, actually themselves already presuppose the Monotonicity Hypothesis, implicitly to be sure. Worse, because the Root Hypothesis entails a basic lexeme, from which others are derived, that has a very bleached and stripped down meaning, analyses that are consistent with the MH follow as a consequence, making it seemingly impossible to test the MH empirically if the Root Hypothesis is taken as a starting point. In addition to these concerns, I also think that adoption of the Root Hypothesis may lead to loss of certain interesting crosslinguistic generalizations. As noted by Haspelmath (1993), for example, the direction of derivation in the causative/inchoative alternation for certain event types is not random across languages. On the Root Hypothesis, there *is* a causative affix for verbs like *break*,

[17] I am not sure that I agree with Pesetsky's characterization of the facts; it is unimportant, however. My concern here is simply to illustrate the fact that some of Pesetsky's argumentation for the Root Hypothesis crucially implicitly assumes the MH.

even in cases where it cannot be seen. In such cases, it is claimed to be accidental that the causative morpheme is null. It turns out, though, that causative uses of verbs like *break* are extremely commonly morphologically unmarked, suggesting, at least to my mind, that they are indeed lexicalized with a causative denotation, not as bound non-causative roots with zero derivation to derive the causative use.

I set the Root Hypothesis aside in further discussion, then, for two reasons. First, theoretically, assuming the Root Hypothesis in the empirical evaluation of the MH would prejudge the question, setting up an affirmative evaluation of the hypothesis in advance of any independent empirical evaluation. Because my goal is to empirically evaluate the MH on its own merits, this would be problematic. Secondly, empirically, I believe that universal crosslinguistic adoption of this hypothesis leads one to miss interesting crosslinguistic generalizations that reveal important facts about the nature of language. Of course, as already discussed, if the Root Hypothesis turns out to be correct it is certainly no problem for the MH—indeed, it is consistent with the MH in a very strong way, as already discussed. I see this as a separate matter, however, one that I leave for future work.

2.5.3 The MH and productivity

A final issue concerning word formation and the MH is the matter of productivity. The MH is a hypothesis about *synchronically productive* word formation rules, and makes no claim either about unproductive word formation rules, or lexicalizations that appear to have been the product of previously productive word formation rules, but have since fallen into disuse. The MH makes no predictions about diachrony, where bleaching is common. Once a rule loses productivity, and words formerly derived via that rule become lexicalized, the derivation no longer productively applies, and the MH therefore no longer governs the semantic relationship between the formerly basic and derived lexemes.

Productivity is obviously a large and very important topic in the morphology literature, and I have nothing to add to it here, in particular how it is that productive and non-productive word formation rules are distinguished (though see Aronoff 1976 and

Aronoff and Anshen 1998). As it turns out, although I take the MH to govern only productive word formation processes, in the difficult cases of word formation rules that appear to violate the MH that I examine in this dissertation, I do not use productivity as an "escape hatch", and there is therefore no need to dwell on it here. Nevertheless, as additional phenomena going beyond the domain of states and changes of state are examined under the rubric of the MH, this is an issue that is likely to come up, and will most likely be in need of serious consideration, as it could well be that a word formation rule that appears to be in violation of the MH is, in fact, not a productive one, and therefore not one that the MH is meant to constrain in the first place. Such cases, although they no doubt exist in the domain of states and changes of state, do not play a major role in this dissertation, and I therefore leave the topic for future investigation.

2.6 States, changes of state, and the MH

In this section I lay out the empirical domain of states and changes of state, making the argument for why it represents an ideal testing ground for the MH. I then go on to discuss the predictions made by the MH in this domain about the derivational relationships among words with such meanings.

2.6.1 States and changes of state

The empirical domain of states, non-causatives changes of state, and causative changes of state is a perfect testing ground for the MH as elaborated above in (12) for several reasons. First, and most importantly, the meanings of such words are reasonably well-understood, both in terms of their decompositional and truth-conditional meaning, thanks in large measure to work by Dowty (1979). Most important for evaluation of the MH are the decompositional analyses of these meanings and their relationships to one another that have been widely adopted on the basis of this work (Foley and Van Valin 1984; Pinker 1989; Jackendoff 1990; Levin and Rappaport Hovav 1995; Van Valin and LaPolla 1997; Wunderlich 1997b; Bierwisch 2002; Baker 2003; Embick 2004). I consider these in this section, with the predictions of the MH on the basis of these representations discussed in the following section.

It is quite common crosslinguistically to find triples of words naming states, non-causative changes of state, and causative changes of state for particular kinds of states, such as the state named by *cool* in (24).

(24) a. Kim cooled the soup. (causative COS)
b. The soup cooled. (non-causative COS)
c. The soup was cool. (state)

While (24a) entails (24b), (24b) in turn entails (24c) (cf. Lakoff 1965).[18] This kind of relationship is extremely common for many lexemes within a given language as well as cross-linguistically (Talmy 1985; Croft 1990; Levin 2001; Koontz-Garboden and Levin 2005; Koontz-Garboden 2005, 2006c, 2007). The data in (25) taken from Levin (1993:245) illustrate the fact that there are many adjective/COS verb pairs in English, with a relationship to one another like the one in (24). Some of these are zero-related, (25a), while others exhibit a derivational relationship whereby the verb is derived from the adjective via the suffix *–en*, (25b).

(25) Deadjectival verbs in English (Levin 1993:245)
a. blunt, clear, clean, cool, crisp, dim, dirty, double, dry, dull, empty, even, firm, level, loose, mellow, muddy, narrow, open, pale, quiet, round, shut, slack, slim, slow, smooth, sober, sour, steady, tame, tense, thin, triple, warm, ...
b. awaken, brighten, broaden, cheapen, coarsen, dampen, darken, deepen, fatten, flatten, freshen, gladden, harden, hasten, heighten, lengthen, lessen, lighten, loosen, moisten, neaten, quicken, quiten, ripen, roughen, sharpen, shorten, sicken, slacken, smarten, soften, steepen, stiffen, straighten, ...

Similar data can be found for a wide range of languages, as evidenced by the data in (26)-(31).[19]

[18]In Chapter 8, I show that characterizing the inferential relationship between these sentences as one of entailment may be an oversimplification of the facts. I use this terminology here for ease of exposition.

[19]In (26)-(31), I speak of *property concept* words (see Chapter 3; Dixon 1982), rather than *adjectives*,

(26) Warlpiri (Hale and Keyser 1998:93)

	prop. concept	non-causative COS	causative COS	
a.	wiri	wiri-jarri-	wiri-ma-	big
b.	maju	maju-jarri-	maju-ma-	bad

(27) Tongan (my fieldnotes; Koontz-Garboden 2007; Churchward 1953, 1959)

	prop. concept	non-causative COS	causative COS	
a.	lōloa	lōloa	faka-lōloa	long
b.	mokomoko	mokomoko	faka-mokomoko	cool
c.	kulokula	kulokula	faka-kulokula	red
d.	mōmoa	mōmoa	faka-mōmoa	dry

(28) O'odham (Hale and Keyser 1998:92)

	prop. concept	non-causative COS	causative COS	
a.	(s-)wegi	weg-i	weg-i-(ji)d	red
b.	(s-)moik	moik-a	moik-a-(ji)d	soft
c.	(s-)'oam	'oam-a	'oam-a-(ji)d	yellow

(29) Spanish

	prop. concept	non-causative COS	causative COS	
a.	triste	en-triste-cer se	en-triste-cer	sad
b.	duro	en-dure-cer se	en-dure-cer	hard

since the words naming these notions are not, in fact, adjectives in all of these languages, but nouns in some (Warlpiri, Ulwa) and verbs in others (Tongan). Although this variation has profound consequences for the relationship between words naming states and changes of state (Koontz-Garboden and Levin 2005; Koontz-Garboden 2005, 2007), it is immaterial for the issue under discussion here, which is simply the fact that there are words with these meanings in language after language that are derivationally related to one another.

(30) Ulwa (Green 1999; Hale and Salamanca 2002; Koontz-Garboden 2006c, 2006d; my fieldnotes)

	prop. concept	non-causative COS	causative COS	
a.	sang-ka	sang-da–	sang–	green/blue
b.	yûh-ka	yûh-da–	yûh–	long, tall
c.	baras-ka	baras-da–	baras–	black
d.	bara-ka	bara-da–	bara–	dark
e.	sik-ka	sik-wa–	sik–	large
f.	warin-ka	warin-da–	warin–	bent

(31) Eastern Armenian (Megerdoomian 2002:98)

	prop. concept	non-causative COS	causative COS	
a.	layn	layn-anal	layn-ats-nel	wide
b.	čor	čor-anal	čor-ats-nel	dry
c.	metz	metz-anal	metz-ats-nel	big
d.	arag	arag-anal	arag-ats-nel	fast

In language after language one finds COS-denoting words that are derivationally related to words naming states. Among the other languages for which I have observed such data are Central Alaskan Yup'ik (Jacobson 1984, 1995), Cora (Vázquez Soto 2001), and other Polynesian languages like Maori (Bauer 1993).

Among the goals of lexical semantic research is to account for these kinds of common relationships in a systematic way, revealing what it is about the meaning of changes of state, for example, that sentences in which words with these denotations are used entail sentences in which words naming states are used, and similarly for sentences containing words naming causative and non-causative changes of state. Lexical decomposition is meant to account for such relationships by identifying the elements of meaning that are responsible for the entailment relationships. On the decompositional analysis, the relationships are mirrored in the decomposition by building up meanings from the state to the non-causative COS and in turn to the causative COS, so that a stripped down informal representation for the different meanings of *cool* in (31) would be as in (32).

(32) a. cool(x)

b. BECOME cool(x)

c. y CAUSE BECOME cool(x)

In this dissertation, I employ a slightly more articulated representation for the meanings of the words under discussion drawing on Davidsonian event semantics (Davidson 1967; Parsons 1990). Following Parsons (1990), Piñón (2001a), Rothstein (2004), and others I extend the Davidsonian treatment of eventive predicates to stative predicates as well, which I treat as having a stative eventuality argument.[20] Concerning the thematic nature of participants in an event, I assume that this follows from the lexical semantics of predicates. I assume an ordered argument approach to thematic relations, as opposed to a neo-Davidsonian theory on which the participants in an event are predicates themselves, taking the event as an argument (Dowty 1989). Despite this, I do at times, however, adopt a formal representation more typical of neo-Davidsonian approaches. That is, I intend no theoretical difference between the representations of the stative predicate *red* in (33).

(33) $[\![red]\!] =$

a. $\lambda x \lambda s[red(s, x)]$

b. $\lambda x \lambda s[red(s) \wedge THEME(s, x)]$

While the representation in (33a) is typical of Davidsonian approaches, the one in (33b) is more characteristic of neo-Davidsonian approaches, in which the participants are treated as predicates of eventive arguments. I, however, treat these as equivalent, using representations like (33b) when I want to make clear what the predicate entails of its participant in the event, e.g., if it has THEME-like properties, etc. The participant in (33a), like the one in (33b), I also take to behave like a theme in the stative eventuality. The only difference is that the representation does not make this clear. I point this out

[20]This may turn out not to be empirically well-motivated (Katz 2003; Maienborn 2005). It is not, however, a crucial assumption. I make it simply because it allows for a relatively straightforward approach to result states (Piñón 1999; Kratzer 2000) in Chapter 3.

because this is, perhaps, a non-standard use of the representation in (33b), which is typically not taken as the meaning of a predicate like *red* itself. Instead, on neo-Davidsonian theories, participant NPs are treated in the same way as adverbs, so that the words in the sentence in (34), for example, would compose as in (35).

(34) The apple is red.

(35) $\lambda P[P(s) \wedge THEME(s, apple)](\lambda s[red(s)])$

Instead, I assume that (33b) (and its Davidsonian equivalent in (33a)) is the denotation of *red* itself—*red* denotes a relation between entities and stative eventualities, and participants in eventualities are treated as in traditional approaches to compositional semantics, so that (absent type-shifting to the type of generalized quantifier, etc.), the compositional treatment I assume for (34) is as in (36).

(36) $\lambda x \lambda s[red(s) \wedge THEME(s, x)](the\ apple)$

I.e., *red* takes a nominal argument; it is not itself the argument of participants in the eventuality it names, despite my use of formal representations like the one in (33b), more typically used in cases where the mode of composition is neo-Davidsonian, as in (35). I use this formalism, again, simply as a way of spelling out clearly what properties the predicate entails of its participants (agent-like, theme-like, etc.). Further, the labels I give to these thematic roles should not be taken too seriously—I remain agnostic as to whether there is a set of L-thematic roles in the sense of Dowty (1989). I simply use these labels as a way of showing explicitly some of the properties that predicates entail of their participants, when such information is relevant, in particular in Chapter 8.

As is common in Davidsonian approaches, I adopt a bi-eventive analysis of causation and of the CAUSE operator (Dowty 1979; Parsons 1990; Levin and Rappaport Hovav 1995; Pustejovsky 1995; Piñón 2001a; Chierchia 2004). This is not entirely uncontroversial (see, e.g. Doron 2003 for an opposing view), but does seem relatively wide spread. I do so without argumentation—the proper nature of causation goes far beyond the scope of this dissertation. Instead, what is really important for the purposes of this dissertation is simply the decompositional operators themselves, i.e., that they exist in some form or another (possibly with some model-theoretic interpretation). This much is widely accepted in some form in work of greatly different theoretical approaches (Lakoff 1965; McCawley 1968; Dowty 1979; Foley and Van Valin 1984; Pinker 1989; Jackendoff 1990; Parsons 1990; Levin and Rappaport Hovav 1995; Wunderlich 1997b; Kiparsky 2001; Piñón 2001a; Bierwisch 2002; Hale and Keyser 2002; Doron 2003; Baker 2003; Embick 2004; Lin 2004; Rothstein 2004). With this much in mind, the more articulated representations of states, non-causative changes of state, and causative changes of state that I take as a point of departure are those in (37), where ϕ stands in for a stative predicate.[21]

(37) a. $\lambda x \lambda s[\phi(s, x)]$
b. $\lambda x \lambda s \lambda e[BECOME(e, s, \phi, x)]$
c. $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, \phi, x)]]$

The entailment relationship between minimal pair sentences with words naming states and changes of state as in (24) is accounted for on decompositional approaches like (37) by giving an analysis of the meaning of the state-denoting word, like (24c) for example, as a primitive meaning, as in (37a). The non-causative COS in turn is decomposed into a state-change operator, typically labeled BECOME, which takes the stative primitive as an argument, as in (37b). Causative changes of state, for their part, are decomposed into a CAUSE operator, which takes two events as its arguments—a causing event, and a COS event, as illustrated in (37c). The idea of the decompositions, then, is that the primitive predicate is stative, with the COS and causative COS representations including the meaning of the state embedded underneath BECOME and CAUSE operators. In this way, the entailment relationship illustrated by the data in (24) is accounted for, since the meaning of the word naming the state is included in the meaning of the word naming the non-causative COS which in turn is included in the meaning of the word naming the causative COS.

Evidence for the presence or absence of these operators ideally comes not only from

[21] Again, when it becomes necessary to make reference to properties entailed by the predicate of its participants, as in Chapter 8, I pull the arguments of the predicate out in a neo-Davidsonian sort of representation, despite the fact that I do not adopt the neo-Davidsonian approach to predicate/argument composition.

entailment relationships like those in (24), but also from a model-theoretic definition of what it means for one of them to be present in a sentence, i.e., how the presence of an operator contributes to the truth conditions of sentences in which words with those operators as part of their decompositional representations appear. At the same time, it is important to point out that the core claims of this dissertation with respect to the Monotonicity Hypothesis are completely independent of any particular model-theoretic definition of these operators. What is important in the context of evaluation of the MH is simply that there are operators like CAUSE and BECOME, regardless of the particular model-theoretic interpretation they are assumed to have. As previously discussed, one doesn't even need to accept that these operators even have model-theoretic interpretations in order to accept my findings. What is important in the context of the MH, is (a) that there are such operators, and (b) that word formation operations add, but do not remove them from the meaning of lexemes. I happen to believe that it is useful to assume model-theoretic interpretations for such operators, but the claims of the MH are independent of this.

With the preceding caveats in mind, for the sake of clarity, I say a bit more about how I believe CAUSE and BECOME can be given some model-theoretic substance in the kind of event semantic approach I have laid out above. In fact, this is all laid out clearly in previous work, particularly that of Parsons (1990), Piñón (2001a), and Rothstein (2004). First, concerning the CAUSE operator, I adopt the so-called "counterfactual" theory of causation, according to which an eventuality *v* is considered to have caused *v'* if *v'* would not have happened were it not for the occurrence of *v*. This theory is discussed at some length by Dowty (1979:99ff.), who surveys much important philosophical work on the topic, and I don't go into any of the formal details here.[22] Further, as previously mentioned, I assume an immediate temporal precedence constraint for CAUSE so that if *v* causes *v'* then *v* immediately temporally precedes *v'*. In this way I take CAUSE to name a specific kind of causal relation (out of other possible ones),

[22] In order to properly formalize the counterfactual theory of causation, possible worlds have to be drawn on. I don't undertake this here, but see Zucchi (1993) and Piñón (2001a) for theories of event semantics with possible worlds.

namely what is typically called in the literature *direct causation*.[23]

Concerning the operator BECOME, responsible for COS semantics, intuitively a change into a state can be said to have taken place, following Dowty (1979:73ff.), himself building on von Wright (1963, 1968), if a state ϕ is false at a time *t'* and true at an immediately following time *t*. In the event semantics I am assuming, this can be informally stated as in Rothstein (2004:107), who defines a BECOME event, for a change into a random state ϕ as

> ... an event *e* such that at the time immediately preceding the beginning of e, $\neg\phi$ is the case and at the time immediately following the end of *e*, ϕ is the case (Rothstein 2004:107).

This same idea is expressed logically by Parsons (1990:119) as in (38), where "Cul" is Parsons' (1990:25) "culmination", a relation between events and times said to hold of an event at the moment that it takes place. The "hold" relation in (38) is likewise a relation between an eventuality and a time such that an event *e* holds at *t* if it is in progress at *t* and a state *s* holds at *t* if it is true at *t* (Parsons 1990:25). Finally, although Parsons (1990) does not seem to define the $<$ relation, it is clearly one between two times *t* and *t'* such that one precedes the other. Further, I believe it makes most sense, at least in the context of the definition of BECOME in (38) to take it to be *immediate* temporal precedence, such that one of the times immediately precedes the other.[24]

(38) $$BECOME(e, s) \wedge Cul(e, t) \rightarrow Hold(s, t) \wedge \neg\exists t'[t' < t \wedge Hold(s, t')]$$

A further property of BECOME as defined by both Parsons (1990:119) and Piñón (2001a:352), who defines it in a manner similar to Parsons (though calling it "Change-of-State", rather than BECOME) is that the theme of the BECOME event must be the

[23]This may be a bit too restrictive. As shown by Levinson (2000:142), drawing on work by McCawley (1978), although it is somewhat marked, the subjects of lexical causatives can on occasion express indirect causes. I gloss over this matter here, as the proper nature of causation, and even of CAUSE, is a complicated matter that goes far beyond the scope of this dissertation.

[24]I believe this is the right relation for the definition in (38) because intuitively, a change into a state could be said to take place even if the state held at some time prior to the change, so long as it did not hold immediately prior to the change. For example, my house could have been red two days ago, green yesterday, and I can still say that I painted it red today, even though it was red two days ago, by virtue of the fact that it was not red yesterday.

same as the theme of the state into which there is a change. In the notation I use in the remainder of the dissertation, I take this axiom as given, and do not represent it in the formulae.

As previously discussed, the MH does not rest on any particular model-theoretic definition of the decompositional operators, or even on the assumption of model-theoretic interpretation at all. Nevertheless, my stance, laid out at length above, is that having model-theoretic definitions of the decompositional operators is methodologically useful, and I believe these are at least good starting points for model-theoretic definitions of CAUSE and BECOME in a semantics with events, like the one I assume in this dissertation. Independent of these particular model-theoretic definitions, I will have reason in the chapters that follow to question some of the representations in (37), and to propose modifications and additions, particularly in the case of non-causative changes of state, of which it turns out that semantic and syntactic arguments support the existence of at least two different decompositional representations. The representations in (37), however, serve as a useful point of departure, and allow for straightforward consideration of the predictions of the MH in the empirical domain of states and changes of state, a matter to which I now turn.

2.6.2 Predictions of the MH in the domain of states and changes of state

As previously discussed, languages commonly have words with the meanings in (37) that are derivationally related to one another and share a common root. Given this state of affairs, the Monotonicity Hypothesis as laid out in (12) makes clear and testable predictions about possible and impossible derivational relationship between words with these meanings. These are listed in (39).

(39) Predictions of the MH about the derivational relationship of states and changes of state

a. Words naming states are predicted never to be derived from words naming non-causative or causative changes of state.

b. Words naming non-causative changes of state could be derived from words naming states.

c. Words naming non-causative changes of state are predicted never to be derived from words naming causative changes of state.

d. Words naming causative changes of state could be derived from states or from non-causative changes of state.

The prediction in (39b), alongside evidence in support of it, is examined in some detail in Koontz-Garboden (2005, 2007) and Koontz-Garboden and Levin (2005), and I do not explore it further in this dissertation. The prediction in (39d) has to do to a large degree with the MH underdetermining what words naming causative COS events are derived from, the prediction being that they could be derived not only from words naming non-causative changes of state, but also from words naming states. That is, both kinds of derivational relationship are predicted to be found. This prediction appears to be correct based on the morphological relationships observable in the data in Koontz-Garboden (2005), for example, but further research is needed. I do not undertake such investigation in this dissertation, however.

In the chapters that follow, I give a detailed examination of the strongest two of the predictions in (39), (39a) and (39c). The first of these concerns the derivational relationship of words naming states (37a) to words naming changes into those states (37b), (37c). Here the MH makes a very clear and very strong prediction—words naming states should never be derived from words naming changes into those states. Such a derivation would necessarily involve the deletion of a BECOME operator, in the case of a derivation of a state (37a) from a non-causative COS (37b), or both a CAUSE and a BECOME operator, in the case of a derivation of a state (37a) from a causative change into that state (37c). Similarly, the prediction in (39c) follows from the fact that given the decompositional representation of non-causative changes of state in (37b) and of causative changes of state in (37c), the derivation of a word naming a non-causative COS from a word naming a causative COS would involve the deletion of a CAUSE operator, in violation of the MH.

Both of these predictions face serious challenges from the data. Ultimately, however, I show that apparent exceptions are actually entirely consistent with the MH. Concerning the prediction in (39a), as I demonstrate in Chapter 3 it is quite common for languages to have certain state-denoting words that are derived from words naming changes of state. As I show, however, such words name result states—states that entail a prior change into the state, and their decompositional representation, therefore, retains the decompositional operators present in the denotation of the COS verb from which it is derived, consistent with the MH. More problematic for the prediction in (39a), as I show in Chapter 5, are state-denoting words in Ulwa (Misumalpan; Nicaragua), which appear to be derived from COS-denoting roots, but which clearly do not name result states. Further investigation of these morphologically complex state-denoting words in Chapter 6 shows, however, that contrary to initial appearances the morphological complexity is due to issues in the lexical category of state-denoting words in Ulwa, which are derived nominals—the derivational operation deriving state-denoting words from bound roots, contrary to initial appearances, does not alter the lexical semantics of the root, and the MH is therefore not violated.

In Chapter 8 I confront the prediction in (39c), which is at odds with the common phenomenon of anticausativization, an operation which appears to derive non-causative COS-denoting verbs from causative COS-denoting verbs. Although this is indeed the case, I show on the basis of a number of empirical arguments that non-causative COS verbs derived in this manner, in contrast with other non-causative COS verbs, do not have the decompositional representation in (37b). Instead they have a more complicated representation that retains the CAUSE operator present in the denotation of the causative verb from which it is derived, thereby making the description of their meaning as "non-causative" something of a misnomer. Further, I show that semantically, anticausativization is reflexivization, an operation that does not affect the decompositional operators in lexical semantic representations. Anticausativization, then, is shown not to violate the prediction in (39c), since the representation of non-causative COS verbs derived by the process is not as in (37b), but is instead one that retains the CAUSE operator present in the denotation of the causative verb from which it is derived.

The conclusion, then, is that the facts, despite initial appearances, when examined in detail support even the strongest of predictions of the MH, at least in the empirical domain under investigation here.

2.7 Conclusion

In this chapter, I have laid the foundations of the Monotonicity Hypothesis as a constraint on the semantic component of word formation operations, making explicit at the same time what I take to be the nature of word meaning and of the MH itself. I went on to lay the foundations for evaluation of the MH, making explicit my assumptions about morphological derivation and its evaluation in the MH, adopting a rather surface-oriented view of the relationship between morphological and lexical semantic derivation, which I believe makes strong, testable predictions that can be evaluated crosslinguistically. I then went on to lay out the empirical domain in which I propose to evaluate the MH empirically—the domain of states and changes of state. I adopted, on the basis of much previous work, particular decompositional representations of the meanings of states and changes of state. On the basis of these representations, I observed that the MH makes two very strong predictions about possible derivational relationships crosslinguistically: words naming states should never be derived from words naming changes of state and non-causative COS verbs should never be derived from causative COS verbs. Both kinds of derivation would involve the deletion of operators, and are therefore predicted by the MH to be non-existent. In the chapters that follow, I make the case that, despite some initial appearances to the contrary, this is indeed the case—at least in the domain of states and changes of state, derivational operations do not remove decompositional operators.

Part II

States

Chapter 3

Two kinds of states

In the previous chapter, I laid out the predictions of the Monotonicity Hypothesis in the empirical domain of states and changes into those states. Among these predictions is (1).

(1) Words naming states are never derived from words naming changes into those states.

In this chapter, I begin the task of examining this prediction in detail. I begin with discussion of the lexical semantics of states, observing that not all states have the same kinds of inferences. In particular, there are two kinds of states relevant for the prediction in (1). The first kind, *result states*, entail that there was a preceding event giving rise to the state. These states contrast with what Dixon (1982, 2004) calls *property concept states*, states that are unspecified for whether there was a preceding event giving rise to the state. Observing the differences in the lexical semantics of these two kinds of states, I note that the MH actually predicts that words denoting each kind of state show strikingly different derivational relationships to words naming changes into states. While words naming property concept states should never be derived from words naming changes into those states, words naming result states should exhibit precisely the opposite derivational relationship to words naming changes of state. I go on to examine these predictions in detail, showing that to a large degree they are borne out by crosslinguistic evidence. There are, however, some apparent counterexamples. Discussion in the literature leads one to believe that in Tagalog, words naming changes of state are derived from words naming result states. As is apparent from the lexical semantic discussion below, such a derivation would be one that would necessarily delete an operator from the lexical semantic representation, in violation of the MH. Further investigation of the Tagalog data suggests, however, that the words from which the COS-denoting words are derived do not, in fact, have result state denotations, but property concept denotations, making the derivation of a COS-denoting word from them consistent with the MH. I also discuss data from Ulwa, a Misumalpan language of Nicaragua in which it appears that property concept denoting words are derived from COS-denoting roots. These facts, while ultimately shown consistent with the MH, require much more detailed analysis, which I undertake in Chapters 5 and 6.

3.1 Property concepts versus result states

The point of departure of Dixon's (1982) now classic paper on adjectival typology is the observation that not all languages have a large open class of adjectives.[1] For the same set of states that are named with words belonging to the class of adjectives in English, other languages assign to these states names belonging to the lexical category of noun or verb. This leads Dixon to raise the question of whether it is the case that there are meanings that are typically adjectival or not. Specifically, are there meanings that are likely to be named by adjectival words so long as the language has at least a small class of them? The result of Dixon's typological survey of nineteen languages with small numbers of adjectives is that indeed, there are certain meanings likely to be named by words belonging to the class of adjectives no matter how small that class is. The classes of meanings most likely to be named by adjectival words, even in languages with a small class of adjectives are those belonging to the classes of *dimensions*, *ages*, *values*, and *colors*. The next class likely to be represented in languages with small adjective inventories are *physical property* meanings, followed by *speed* and *human propensity* meanings. These classes are laid out, with examples from English, in (2).

[1]This section follows closely similar discussion in Koontz-Garboden (2005).

(2) Dixon's classes of property concept states (Dixon 2004:3ff.)

dimension	big, small, long, tall, short, wide, deep, etc.
age	new, young, old, etc.
value	good, bad, lovely, atrocious, perfect, proper, etc.
color	black, white, red, etc.
physical	hard, soft, heavy, wet, rough, strong, hot, sour, etc.
speed	fast, quick, slow, etc.
human propensity	jealous, happy, kind, clever, generous, cruel, proud, etc.

The conclusion is that there is a core set of meanings, in the classes of *dimension*, *age*, *value*, *color*, that is likely to be named by adjectives, no matter how small the class. Other kinds of states such as *physical properties*, *speeds*, and *human propensities* also tend to be named by words belonging to the lexical category adjective, though this tends to be the case in languages with a larger, open class of adjectives. These findings suggest that these kinds of meanings are privileged in some (not well-understood) way.

In addition to this core finding, Dixon also shows that the class of stative meanings that tend to be named by adjectives, henceforth *property concept states*, contrast with another class of stative meanings "… that are the result of some action" (1982:50). These two classes of stative meanings differ from one another in their entailments—while result states entail that there was an event giving rise to the resulting state named by the word, this is not the case for property concept states. This contrast is illustrated by the data in (3) and (4).

(3) a. #The glass is broken, but it never broke.
b. #Kim prefers his barbecued chicken uncooked.
c. #Sandy is dressed, but neither she nor anyone else dressed her.

(4) a. The dirt is red, but nobody reddened it.
b. Mount Chimborazo is tall and has always been so.
c. Winter is and always has been a bad time to plan a picnic.

The data in (3) show that there must be a prior event leading up to the states of *broken, barbecued* and *dressed*. When the entailment that there was a prior event leading up to the result state is contradicted, the sentence is contradictory. For example, (3a) shows that if something is *broken*, it must be the case that that something underwent a breaking event. To deny that there was a prior breaking event leads to contradiction. Likewise for *barbecued*—meat cannot be inherently barbecued. As shown by the data in (3b) it must undergo some sort of cooking process (i.e., barbecuing) in order to reach the result state *barbecued*. The same holds for being *dressed*—one cannot be dressed without putting on clothes, as shown by (3c). These facts contrast with the facts for property concept states, as illustrated by the data in (4). In English speakers' conceptualization of the world, at least, there is no sense in which red dirt becomes red (4a), a mountain must become tall (4b), or a time of year has to become bad (4c). Because these states do not entail a prior event, sentences that deny that there was such an event leading up to the state, like those in (4), are not contradictory.

The contrast in entailment behavior between property concept states and result states is also illustrated quite clearly in English by morphologically basic adjectives, which name property concept states, and their corresponding deverbal adjectives, which name result states that entail a change into the property concept state. The contrast is exemplified in (5)–(7).

(5) a. Look at the bright picture on your left. (=camera took a bright picture)
    b. Look at the brightened picture on your left. (=camera took a bad picture, brightened with e.g. software)

(6) a. Kim ate a red apple.
    b. Kim ate a reddened apple.

(7) a. Sandy's shirt has long sleeves.
    b. Sandy's shirt has lengthened sleeves.

The data in (5)-(7) illustrate a minimal contrast between property concept states and result states. While the picture in (5a) is inherently *bright*, the picture in (5b) had to undergo some sort of brightening process in order to reach the result state *brightened*. Things are similar for the apple in (6)—whereas in (6a), the apple is just inherently red, the apple in (6b) had to become (more) red via some sort of reddening process. The data in (7) illustrate a similar contrast. While the sleeves of Sandy's shirt are just plain long in (7a), they had to become long via some sort of lengthening process in (7b).

The data discussed in this section, then, show that property concept states and result states are semantically speaking two different kinds of states. While result states entail that there was a prior event giving rise to the state, property concept states do not. In the section that follows I flesh out this difference between the two kinds of states more formally.

3.2 Lexical semantic representations

3.2.1 Result states

Standard analyses of result states in the literature (Parsons 1990; Piñón 1999; Kratzer 2000; Deo 2006) posit a result state operator, generally treated as the denotation of the extra morphology that often shows up on words naming result states.[2] On standard treatments of the phenomenon, which I largely adopt, what this operator does is to map a predicate of events into its result state. In this section I develop an analysis of the meaning of result states that informs predictions made by the MH with regard to their derivational relationship to words naming changes of state.

To begin, consider again a sentence with a result state predicate as opposed to one with a property concept state predicate, as in (8).

(8) a. Kim saw the *reddened* dirt.
b. Kim saw the *red* dirt.

While the dirt Kim saw in (8a) is necessarily red as a result of some prior event of reddening, this is not the case in (8b). More specifically, the dirt in (8a) is red at the event time as a result of the prior event and crucially, prior to participating in that event, it could not have been the case that it was already red; in such a situation, (8a) would be infelicitous. More formally, and using the terminology from Parsons (1990) laid out

[2]The discussion in this section takes as a point of departure similar discussion of result state uses of the perfect in §2.2 of Koontz-Garboden (2007).

in Chapter 2 in the context of the discussion of the BECOME operator, it can be said that a result state is a state *s* that holds at a time *t*, does not hold at an immediately preceding time *t'*, and for which there is an event *e* that culminates at *t'*. This is stated more formally in (9).[3]

(9) A state *s* is a result state and is true of x, a theme of *s*, iff $\exists t \exists t' \exists e[t' < t \wedge Hold(s,t) \wedge \neg Hold(s,t') \wedge Cul(e,t')]$

From the definition in (9) and from the truth conditions of state change discussed in Chapter 2, it follows that prior to the time at which the (result) state can be said to be true, there must be a change into that state, since the definition is such that *t'* immediately precedes *t* and the state must not hold at *t'* but must hold at *t*. This is precisely what it means for a COS to have taken place (cf., the truth conditions for BECOME in Chapter 2), and it therefore follows that the state that holds at *t* holds as a result of a change into that state.

Result state meanings are typically generated by positing some kind of result state operator that takes an eventive verb as an argument and maps it to its result state (Piñón 1999; Kratzer 2000; Deo 2006). In light of the truth conditions for result states in (9), I take it that a result state is simply the state in the decompositional representation of a COS-denoting verb—what the result state operator does is to map the COS event into the state that holds as a result of the event.[4] I formalize this in (10).

(10) $\lambda P \lambda x \lambda s \exists e[P(e,s,x)]$

[3]It is worth noting here that I am not taking care to make a distinction between target states and resultant states (Parsons 1990; Kratzer 2000). What is important for me is simply that state-denoting words derived from COS-denoting words entail a prior event of change leading to the (result) state. This is true for both resultant and target states. The distinguishing feature of these two kinds of states (if indeed they are distinguishable at all), whether the state that holds as the result of the prior event is reversible or not, is irrelevant.

It is also worth pointing out that a fully worked out formalization of the meaning of result states would probably need to include some kind of causal relation between the event preceding the result state and the result state itself.

[4]A nice consequence of this formalization is that result states are defined only for predicates taking both an eventive and a stative Davidsonian argument. This should restrict result states to exactly the kinds of predicates for which they are generally observed to be attested, namely only accomplishments and achievements (Mittwoch 1988; Kiparsky 2002).

A relevant observation from the perspective of the MH regarding the formalization of the result state operator in (10) is that this operator at once saturates the event argument of the verb that it takes as an argument and existentially binds it, thereby adding an operator (existential quantification) to the decompositional representation. This addition of an operator is, of course, in line with the kinds of operations on decompositional representations sanctioned by the MH. The fact that an operator is added in the derivation, though, has consequences for the types of word formation operations predicted by the MH to be attested across languages. These consequences are discussed below.

The derivation in (11) illustrates how the meaning of the result state named by *reddened* is derived compositionally from the result state operator and the meaning of the intransitive COS verb *redden*.[5]

(11) $[\![reddened]\!] =$
$\lambda P \lambda x \lambda s \exists e[P(e, s, x)](\lambda x \lambda s \lambda e[BECOME(e, s) \wedge red(s) \wedge THEME(s, x)]) =$
$\lambda x \lambda s \exists e[\lambda x \lambda s \lambda e[BECOME(e, s) \wedge red(s) \wedge THEME(s, x)](e, s, x)] =$
$\lambda x \lambda s \exists e[BECOME(e, s) \wedge red(s) \wedge THEME(s, x)]$

In light of the definition of BECOME in Chapter 2 and the meaning of the result state operator in (10), a result state like that named by *reddened* is as in (11) whereby it is a function from entities to sets of states which are preceded by a time at which the state does not hold. To say it another way, they are functions from entities to sets of states that are preceded by a change into that state, i.e., by a BECOME event.

Assuming that the result state operator has the denotation in (10) and that this is the

[5]For the purposes of the formalization in (11), I treat the argument of the result state operator as the meaning of an intransitive, rather than transitive verb. This is almost certainly not the right treatment for all result states in all languages. For example, as pointed out to me by Beth Levin, *killed* as in *the freshly killed chicken*, is quite clearly derived not from intransitive *die*, but from transitive *kill*. With what kinds of events and with what kind of crosslinguistic variation words naming result states are derived from intransitive or transitive COS verbs is a matter worthy of further research, but which goes beyond the scope of this study.

On the analysis I lay out here, a separate operator would be required for the derivation of a result state predicate from a transitive verb. In addition to existentially binding the event argument, this operator would also have to existentially bind the external argument of the transitive verb. One advantage of the severed external argument analysis of Kratzer (2000) is that the same result state operator can be used for both intransitive and transitive COS verbs. Such an analysis is consistent with the MH; I do not assume it, however, for unrelated reasons. See Chapter 2 for further discussion.

denotation of the morphological marker of result states (e.g., *–en/–ed* in English and the like in other languages), then on this analysis two important properties follow. First, this operator can take as an argument only COS verb denotation, and secondly, it should be the case that all state-denoting forms appearing with the morphological marker of the result state operator should entail a prior event giving rise to the state denoted by the suffixed form. In English, while this is generally the case, as illustrated by the data discussed above, there are some seemingly curious data that require a bit more explanation. Kratzer (2000:9) observes that there are some morphologically derived state-denoting words that do not entail a previous process named by the verb from which they are derived. This is apparently the case for some uses of the deverbal adjective *obstructed*. In (12), for example, a prior process need not precede the state of obstruction denoted by the deverbal adjective.

(12) The blood vessel was obstructed. (Kratzer 2000:9)

Kratzer goes on to observe, however, that the verb *obstruct*, in addition to COS uses, also has stative uses, as illustrated by the data in (13).

(13) Because of a congenital malformation, tissue obstructed the blood vessel. (Kratzer 2000:9)

Kratzer's (2000) observation is that it is only verbs that have stative uses that can denote states in their derived stative form that are not preceded by events. These are verbs like e.g., *surround, cover, support, illuminate, depress, worry*, etc., with naturally occurring examples with the verb *surround* and its derived stative counterpart *surrounded* given in (14).

(14) a. ... soaring mountains surround the warm crystal clear waters ...
`http://www.uyaphi.com/malawi/accommodation/Chinthecheinn.htm`

b. We embark our zodiacs for a cruise of exploration into Black Turtle Cove, named after the black sea turtles who inhabit its calm mangrove surrounded waters.
`http://www.infohub.com/TRAVEL/SIT/sit_pages/11827.html`

As with Kratzer's *obstruct/obstructed* example, the data in (14a) illustrate the fact that the verb *surround* need not be eventive. As a consequence, the use of derived stative *surrounded* without event entailments, as in (14b), is expected. When the derived state denoting word lacks preceding event entailments, then, it is because it is, in fact, not derived from an event-denoting verb but from a state-denoting verb in the first place.[6]

These facts have two important consequences for the discussion here. First, it means that the denotation proposed for the morphological marker of result states is not always as I have said—there will have to be a different denotation for it when it operates on state verbs.[7] Secondly, and more importantly, there can be words naming states with

[6]I believe the same state of affairs most likely holds for the so-called "stative" suffix *–ik* in Chichewâ (Dubinsky and Simango 1996). The majority of the data discussed by Dubinsky and Simango (1996) suggest that the state-denoting words appearing with this suffix name result states. Nevertheless, Dubinsky and Simango (1996:772, fn. 19) claim that it is not a property of *–ik* words that they entail that there was an event leading to the state that they denote, citing the data in (i).

(i) Nthambi ndi yo-pind-ika ngakhale si-i-na-pind-idwe.
branch is AGR-bend-STAT even.though NEG-AGR-PAST-bend-PASS
'The branch is [in a state of being] bent, event though it was not bent.' (Dubinsky and Simango 1996:772, fn. 19)

Although *bend* in English has as perhaps its most salient meaning a change into a state, verbs like *bend* often have stative uses crosslinguistically, suggesting that the word for "bend" in (i) likely behaves like Kratzer's *obstruct* verbs discussed above. Indeed, verbs with meanings like "bend" in some Meso-American languages like the Mayan and the Sumu languages belong to a special class of stative predicates often called *positionals* (Haviland 1994). (These verbs may also be related to so called "fictive motion" uses of motion verbs (Langacker 1986:464; Matsumoto 1996; Talmy 2000:Chapter 2), though this requires further research.) Even in English stative uses of verbs like *bend* can be found, as exemplified by the naturally occurring examples in (ii).

(ii) a. The river bends left around a gravel bar, then flows along a cliff on the left. ... At the top of a wide gravel bar, the river bends left into a fast chute.
`http://www.visit-eldorado.com/american_river.html`
b. At the NFFC training ground, the river bends around to the Coxes left (or Stroke side).
`http://www.nurc.co.uk/Steering%20Advice.doc`

Thus, contrary to Dubinsky and Simango's (1996:771ff.) analysis whereby *–ik* marks a process in violation of the MH that deletes both a CAUSE and a BECOME operator from the LCS of the verbs it suffixes to, I think instead that there is something special about the lexical semantics of verbs like *bend* such that sentences like (i) are not contradictory. Of course, one cannot say for sure without more data from other verbs, and without seeing for sure if verbs like *bend* really do have stative uses in Chichewâ in the first place. The prediction, however, is clear, and contrary to initial appearances, I do not believe that there are any data in Dubinsky and Simango (1996) that straightforwardly counterexemplify the MH.

[7]Laying out exactly what this is, as well as what the denotation of the stative uses of verbs like *obstruct*

the morphological shape of result state denoting words that do not, in fact, have result state entailments. I point this out because facts like these could incorrectly lead to the conclusion that in uses such as (13), prior event entailments have been lost as part of the derivation. The fact that verbs like this are stative, however, shows that these event entailments were never there to begin with, and that consequently, these facts are not counterevidence for the MH. Care must be taken, then, in making clear what the prediction of the MH is—if the morphologically derived state is derived from an eventive COS verb, the MH predicts the event entailments to be present, since the MH precludes the deletion of operators, like the one that existentially binds the COS event argument in the representation of result states. If derived from a stative verb, however, they needn't be present in the denotation of the morphologically derived state-denoting word, since they were not there to begin with.

3.2.2 Property concept states

Contrasting with result states, property concept states do not entail a prior event giving rise to the state. This follows from the representation proposed for "states" (which are, in fact, property concept states) in Chapter 2, exemplified by (15), the denotation of *red*.

(15) $[\![red]\!] = \lambda x \lambda s[red(s, x)]$

Words naming property concept states like *red*, on my view, simply name functions from individuals to sets of stative eventualities of a kind specified by the lexical nature of the predicate of the Davidsonian state argument. While the representation allows that there *could* be a prior event giving rise to the state, this is not specified as part of the lexical meaning of the word, and it can therefore be the case that there either is or is not such a preceding event. In this way, the difference between minimal pair sentences like those in (8), repeated in (16), is captured.

(16) a. Kim saw the *reddened* dirt.
b. Kim saw the *red* dirt.

is, is somewhat tangential to the matters under consideration, and I leave it for future work.

As previously discussed, the denotation of *reddened*, given in (11), is such that the state that it names must be preceded by a change into that state. And indeed, the sentence in (16a) does entail that the dirt is red as a result of some prior reddening process. By contrast, the denotation of *red*, given in (15), does not specify anything about how the argument came to be in a state of redness—it merely entails that at the time of evaluation, it is indeed red. This could be as a result of some process or not. Stated another way, the denotation of *red* is underspecified, on this view, with respect to whether the state holds as a result of a previous process or not, so that it is predicted that a sentence like (16b) could be used in contexts where the state is inherent, as in (17a), or where it has come about as a result of some prior process, as in (17b).

(17) a. Mars is sometimes referred to as the Red Planet.
`http://www.nineplanets.org/mars.html`

b. I could see the red face. I could feel embarassment [sic] for both Dave and the other guy.
`http://twominuteoffense.blogspot.com/2005/05/on-disrespectful-disagreement.html`

The difference, then, between result states and property concept states is that the meaning of the former includes a COS event, while the meaning of the latter is a basic, primitive state meaning, one of the basic building blocks of lexical semantic representations (Koontz-Garboden 2005). Given these differences in the meanings of the two kinds of states, the MH makes very different predictions about the kinds of possible derivational relationship between words naming these two different kinds of states and words naming changes of state.

3.3 Predictions of the MH for the two kinds of states

Given the differences in the decompositional representations of states, changes of state, and result states discussed above, the MH makes several predictions about possible derivational relationships between words with these meanings. The decompositional representations of these meanings are repeated in (18) below based on the property concept state denoted by *red* in (18a), a non-causative change into that state in (18b), and a result state in (18c).

(18) a. $\lambda x \lambda s[red(s) \wedge THEME(s, x)]$
b. $\lambda x \lambda s \lambda e[BECOME(e, s) \wedge red(s) \wedge THEME(s, x)]$
c. $\lambda x \lambda s \exists e[BECOME(e, s) \wedge red(s) \wedge THEME(s, x)]$

Given that the property concept state (18a) is included in both the COS (18b) and the result state (18c), the MH predicts that although words naming the latter two kinds of meanings could be derived from words naming property concept states, words naming property concept states could never be derived from either words naming changes of state or from words naming result states. Similarly, because the result state is built on the COS via existential binding of the event argument in the COS, the MH predicts that although words naming result states could be derived from words naming changes of state, the reverse could never be the case, since this would involve deletion of the existential quantifier.[8] These refined predictions about the relationships of states to changes of state sanctioned by the MH are laid out in (19).

(19) Refined predictions of the MH for the derivational relationship between words naming states and words naming changes of state.
a. Words naming property concept states are not derived from words naming changes of state.
b. Words naming changes of states are not derived from words naming result states.
c. Words naming result states could be derived from words naming property concept states.

[8] Again, I am treating only the derivation of result states from non-causative changes of state. The same predictions, however, would extend to the relationship between causative changes of state and result states based on them—result states could be derived from causative changes of state, but not vice versa, since the derivation of a result state would involve, just as with their derivation from non-causative changes of state, existential binding.

This prediction depends upon my treatment of the existential quantifier as an "operator" in a sense relevant for the MH. This issue is discussed further in §10.2.1.

d. Words naming result states could be derived from words naming changes of state.

In the section that follows, I examine data from several languages that bear on the strongest two of these predictions, (19a) and (19b). As I show, it is indeed quite common to find a contrast in the predicted direction: (a) words naming property concept states tend to be morphologically simple, derived from no other word, whether words naming result states or changes of state and (b) words naming result states are very commonly derived from words naming changes into those states.

3.4 Property concept and result states crosslinguistically

In addition to exemplifying the semantic contrast between result states and property concept states, the data in §3.1 also show that in English there is a morphological distinction to be made between words naming property concept states and words naming result states. While words naming property concept states in English are monomorphemic, those naming result states are morphologically complex, derived from the verbs naming the events giving rise to the result state. In the following sections, I show that this semantic contrast between result states and property concept states is reflected morphologically not only in English, but in other languages as well, precisely as predicted by the MH. While words naming result states are derived from a verb denoting the event leading to the result state, words naming property concept states are monomorphemic, underived. I show that this generalization holds for Quechua, Eastern Armenian, Tongan, and Pima.

3.4.1 Cuzco Quechua

In Quechua words naming property concept states are morphologically simple, derived neither from words naming non-causative or causative changes of state. In fact, the reverse is true—words naming changes into property concept states are derived from words naming property concept states themselves. This is illustrated by the data in (20) from the Cuzco dialect.

(20) a. wasi-qa **hatun**-mi (ka-sha-n)
house-TOP big-EVIDENTIAL be-PROG-3P
'The house is big' (Martina Faller, p.c.)

b. **hatun-ya:**-y
big-INCH-INF
'become big' (Cusihuaman 1976:195)

c. wasi-ta **hatun-ya:-chi**-rqa-n
house-ACC big-INCH-CAUS-PAST-3P
'(s)he made the house big.' (Martina Faller, p.c.)

The data in (20) show that the word for 'big' in Quechua is morphologically basic in its stative denotation. The word denoting the associated non-causative COS is then derived from the word denoting the state, as shown in (20b). The word denoting the causative COS for its part, is derived from the word denoting the non-causative COS via additional affixation, as is illustrated by the data in (20c). Other words denoting property concept states seem to pattern similarly. According to Weber, describing the related Huallaga dialect, *–ya:* is an inchoative marker and "… seems to be completely productive …" occurring with property concept state words with meanings such as 'big', 'crazy', 'white', 'rich', 'red', 'sickness/sick person', 'curly', 'hard', 'deaf', etc. (Weber 1989:30-31). Words denoting causative changes of state can then be derived from the *–ya:* marked non-causative changes of state with the *–chi* causative suffix (Weber 1989:166; Cusihuaman 1976:194; Martina Faller, p.c.; compare (20b) to (20c)).

This direction of derivation from state to non-causative COS to causative COS contrasts with the direction of derivation for words naming states that entail an event giving rise to a result state. This is illustrated by the data in (21).

(21) a. Tela **qhasu-sqa** ka-sha-n.
cloth tear-PAST.PART be-PROG-3P
'The cloth is torn.' (Martina Faller, p.c.)

b. tela **qhasu-ku**-n.
cloth tear-REFL.-3P

'The shirt tore/got torn.' (Martina Faller, p.c.)

c. tela-ta **qhasu**-sha-n.
cloth-ACC tear-PROG-3P
'She/he tore the shirt./She tears/is tearing the cloth.' (Martina Faller, p.c.)

For events like 'tear', the word denoting the state is a participle derived from a verb (Weber 1989:282-283; Cusihuaman 1976:225), as illustrated by the data in (21a). The word denoting the non-causative COS, for its part, is derived from the word denoting the causative COS with the reflexive marker *–ku*, as seen in (21b)-(21c).

The data, then, show that as in English, Quechua has a contrast in the morphological complexity of words denoting property concept states as opposed to those denoting result states. While the former are morphologically simple, derived neither from words naming causative or non-causative changes of state, the latter are morphologically complex, derived from COS verbs. This contrasting behavior in the derivational relationship of property concept states and result states to changes of state is precisely what is predicted by the MH.

3.4.2 Eastern Armenian

Megerdoomian (2002:96) observes the same sort of contrast in Eastern Armenian as laid out above for English and Quechua—words naming property concept states are morphologically simple, while words naming result states are deverbal. The data in (22) illustrate the first of these cases, where words naming property concepts are morphologically simple, with words naming changes of state derived from them. While the morpheme *–anal* derives a word naming a non-causative COS event, *–ats–* derives a word naming a causative COS event.

(22) Eastern Armenian (Megerdoomian 2002:98)

adjective	non-causative COS	causative COS
layn (wide)	layn-anal (widen)	layn-ats-nel (widen)
čor (dry)	čor-anal (dry)	čor-ats-nel (dry)
metz (big)	metz-anal (grow)	metz-ats-nel (grow, bring up)
arag (fast, quick)	arag-anal (quicken)	arag-ats-nel (accelerate)
čaq (fat)	čaq-anal (become fat)	čaq-ats-nel (fatten)
sev (black)	sev-anal (blacken)	sev-ats-nel (blacken, darken)

By contrast, words naming result states are derived from words naming changes of state, as discussed by Megerdoomian (2002:105ff.) and as is illustrated for the verb meaning 'break' by the data in (23), where *–atz* in (23a) is the suffix deriving a word naming a result state from the COS verb in (23b).

(23) a. im k'ot'R-atz bajǩak'-ə
my break-RES glass-NOM/ACC
'my broken glass' (i.e., 'the glass that I or someone broke') (Megerdoomian 2002:106)

b. Ara-n bajak'-ə k'ot'R-ets.
Ara-NOM glass-ACC break-AOR.3SING
'Ara broke the glass.' (Megerdoomian 2002:97)

In Eastern Armenian, then, just as has been seen for English and Quechua, words naming property concept states are in a privileged class of states in that they are monomorphemic, and are not derived from words naming changes into those states. Words naming result states, by contrast, exhibit precisely the reverse behavior—they are derived from words naming changes of state. This behavior is precisely that predicted by the MH.

3.4.3 Tongan

Tongan is another language that distinguishes two classes of states. Again, as in the other languages discussed above, words naming property concept states are morphologically simple, contrasting with words naming result states, which are morphologically complex, derived from words naming changes of state.[9]

The data in (24) illustrate the morphological simplicity of words naming property concept states in Tongan. Additionally, they also illustrate the fact that the word denoting the causative COS event is derived from the word denoting the property concept state via prefixation with *faka–*, as in (24b).[10]

(24) Tongan (property concept states)

a. Ko e hala ‘oku lahi.
PRSTNL the road PRES wide
‘The road is wide.’

b. Na‘e faka-lahi e he pule‘anga ‘a e hala.
PAST CAUS-wide ERG the government ABS the road
‘The government widened the road.’

As in other languages discussed, words naming result states contrast with words naming property concept states, in that words in the former class are morphologically complex, more specifically, deverbal. This is true for Tongan as well, as illustrated by the data in (25). These data show that words naming result states are derived from verbs denoting the causative COS event, contrasting with the situation for property concept

[9]Work with a native speaker consultant in East Palo Alto, CA during 2003 suggests that the process deriving result states with *ma–* in Tongan, described below, may no longer be productive. This is a matter that should be further investigated with additional speakers. Nevertheless, data reported in Polinskaja (1988), and which can also be gleaned from Churchward’s (1959) dictionary do demonstrate that there are indeed many *ma–* derived forms, suggesting that even if it is not presently productive, the process deriving result states with *ma–* most likely was productive at some prior stage of the language. Further, according to Evans and Ross (2001) Proto-Oceanic *ma–* did have a productive valence-decreasing function. See also Evans (2003:84ff., 268ff.) for further discussion.

[10]In Koontz-Garboden (2007), I show that the derivation of words naming non-causative COS events in Tongan involves a process of post-lexical aspectual coercion (Moens and Steedman 1988; Jackendoff 1997; de Swart 1998; Zucchi 1998; Michaelis 2004), which I argue, also in Koontz-Garboden (2007), is itself consistent with the MH.

states, where the word naming the causative COS is actually derived from the word naming the property concept state.

(25) Tongan

a. Ko e hele ‘oku *ma*-pelu.
PRSTNL the knife PRES MA-bent.
‘The knife is bent.’ (S.L., pg. 81)

b. Na‘e pelu ‘e Mele ‘a e hele.
PAST bend ERG Mele ABS the knife
‘Mele bent the knife.’ (S.L., pg. 81)

In Tongan, as observed for the other languages under discussion, there is an asymmetry in direction of derivation—for words naming the two kinds of state, as in the other languages, the asymmetry goes in the direction predicted by the MH.

3.4.4 Pima

Data reported by Smith (2006) on Pima (Uto-Aztecan), suggest that the same sort of contrast in derivational behavior between words naming property concept states and words naming result states is found in this language as well. The contrast is illustrated by the data in the table in (26).[11]

(26) Pima state-denoting predicates (Smith 2006)

adjective	non-causative COS	causative COS	gloss
ge’e	ge’e-da	ge’e-da-jid	(big)
moik	moik-a	moik-a-jid	(soft)
hain-s	’e-hain	hain	(break)

The table in (26) shows that there are certain words naming states that are morphologically simple and whose meanings seem to correspond to those of Dixon’s (1982)

[11] The process deriving an inchoative from a stative is actually phonologically more complicated than suggested in (26), having to do with phonological weight. The details of this process are irrelevant for my purposes, and I have therefore chosen to give the surface forms. See Smith (2006) for details.

property concept states. By contrast, there are other state-denoting words, like the word for "broken" in (26), that are morphologically complex, derived with the suffix *–s*, which generally seems to mark the derivation of a result state in Pima (Jackson 2004, 2005).[12]

The observation that there is a split in the derivational behavior of words naming changes into property concept states and those naming more *break*-type COS events is one that has previously been made for the closely related language O'odham by Hale and Keyser (1998, 2002). The observation emerging from Smith's (2006) data above, that the contrast extends to stative words based on these kinds of events, makes sense in light of their original observations, and should not be surprising. Of course, in the context of the MH, this split is not surprising either.

3.5 Discussion

In the following sections, I discuss the empirical generalizations that emerge from the data discussed in the previous sections and how they line up with the refined predictions in (19). At the same time, I discuss some potential counterexamples to both the empirical generalizations and to the predictions of the MH.

3.5.1 Words naming result states are derived

The Monotonicity Hypothesis predicts that languages would not lexicalize a morphologically simple word with a result state meaning only to have that meaning undergo some derivational operation deleting the result part to give rise to a verb denoting the event

[12] The situation is somewhat more complicated than this, but the facts, I believe, go in the predicted direction. The suffix *–s* seems to be found in some contexts where a prior event is not entailed (Jackson 2004:7; 2005:128). Jackson observes, however, that it is only in cases where *–s* affixes directly to a (pre-categorial) root that it can lack the prior event entailments. In cases where it affixes to a (derived) verbal stem, it does entail a prior event. This suggests, consistent with the general flavor of the analyses of Jackson (2004, 2005) and Smith (2005, 2006) that certain Pima roots may have maximally underspecified meanings consistent with the "Root Hypothesis" (Arad 2005). (As discussed in §2.5.2, the claims of the Root Hypothesis are quite consistent with the predictions of the MH.) The idea, then, is that *–s* attached to a root is operating on a stative meaning, as in the Kratzer *obstructed* examples discussed above. Consistent with the severed external argument analysis (Kratzer 1996; Marantz 1997), when the root is turned into a verbal stem, it becomes eventive. With *–s* suffixed to this stem form, then, a prior event is entailed. This is consistent with the MH.

that gives rise to the state. In the more formal terms laid out above, no process could remove the existential quantifier that quantifies over the event only to re-lambda abstract over it. This would be an operation that would remove an operator from the denotation of the lexeme, and would therefore be in violation of the MH, or more specifically of the prediction of the MH in (19b), repeated in (27).

(27) Words naming changes of states are not derived from words naming result states.

As illustrated by the data discussed above, this prediction seems to be borne out across several genetically distinct languages—words naming result states seem to be derived from words naming changes of state. In none of the languages discussed above does the reverse situation seem to hold; it does not seem to be the case that words naming COS events are derived from words naming result states.

The only language I have observed in which it initially appears as though COS verbs might be derived from result state denoting words, in violation of the MH and of (27), is Tagalog, based on discussions like that of Foley and Van Valin (1984:67,70). According to Foley and Van Valin, in Tagalog words naming the states “dead” (28a) and “broken” (29a) are morphologically simple. Words naming changes of state like “die” (28b) and “break” (28b,c), in turn, are derived from the state-denoting words, as illustrated by the data below.

(28) a. matay ‘dead’
b. ma-matay ‘die’ (Foley and Van Valin 1984:67,70)

(29) a. basag ‘broken’
b. ma-basag ‘become broken’
c. mag-basag ‘cause become broken’ (Foley and Van Valin 1984:67,70)

In both (28) and (29) it appears to be the case that a word naming a COS is derived from a word naming a result state that presumably presupposes an event (named by the derived COS verb) that gives rise to the state. It seems, then, that the derivational operation marked by *ma–* in (28b) takes as an input a meaning something like (30a), giving rise to a meaning something like (30b) via deletion of an existential binding operator, and re-lambda abstraction over the event variable, in violation of the MH.

(30) a. $\lambda x \lambda s \exists e[BECOME(e, s) \wedge \text{not-alive}(s) \wedge THEME(s, x)]$
b. $\lambda x \lambda s \lambda e[BECOME(e, s) \wedge \text{not-alive}(s) \wedge THEME(s, x)]$

Now, according to a detailed personal communication from Daniel Kaufman, it turns out that for the particular data points illustrated by Foley and Van Valin in (28) and (29), the situation is actually not as they suggest—phonological evidence demonstrates that *matay* in (28a) and *basag* in (29a) are actually themselves derived from a more basic root, and that it is from this basic root as well that the COS verbs in (28b) and (29b) are derived, not from the ostensibly result state denoting words in (28a) and (29a).[13] In the case of *matay* and *basag*, then, notwithstanding the discussion in Foley and Van Valin (1984), it is not the case that COS-denoting words are derived from result state denoting words. In these cases, the derivational relationships for these particular lexemes are simply more complex than Foley and Van Valin had appreciated.

Despite this complication with *matay* and *basag*, Kaufman (p.c.) shows that there are indeed tuples of state/COS-denoting words that appear, again superficially, to behave in the manner implicitly suggested by Foley and Van Valin (1984), i.e., where the COS-denoting words are clearly derived from a state-denoting word, which on initial appearances one might take to be result state denoting.[14] The data in (31) illustrate a potential case.

[13]The phonological evidence is in the placement of stress. According to Kaufman, the root form of *basag* has penultimate stress while the (derived) state-denoting form has final stress. This stress shift, he argues, marks a derivation from the bare root, itself nominal, to the state-denoting form. The situation is a bit more complicated with *matay*, owing to some fossilization, but the idea is the same—that the state-denoting form *matay* is derived from a root from which the COS verb is also derived, so that it is actually not the case that (28b) is derived from (28a). Instead, they are both derived from a common root.

[14]I say implicitly here, because Foley and Van Valin (1984) actually don't address the question of whether the state-denoting words from which the COS-denoting words are derived name result states or property concept states. Instead, that they name result states is simply suggested by the glosses they use to translate the state-denoting words into English. Foley and Van Valin's (1984) discussion of Tagalog verb morphology is not sensitive to the distinction discussed in this chapter between result states and property concept states. It is because of this, I believe, that one might read their discussion believing to have found a violation of the MH, with COS verbs derived from result state denoting words. See below for further discussion.

(31) a. wala
b. ma-wala
'to disappear'
c. wala-in
'to make disappear' (Kaufman, p.c.)

According to Kaufman, the COS-denoting words in (31b,c) are derived directly from the state-denoting word in (31a). The question, then, is whether the state-denoting word in (31a) names a property concept state or a result state, i.e., whether it is best glossed in English as 'to not exist' or 'disappeared'. The kinds of glosses given by Foley and Van Valin (1984) to the state-denoting words in (28a) and (29a) lead one to the conclusion that they name result states. Of course, for (28a) and (29a), as already discussed, these are not, contrary to the discussion in Foley and Van Valin (1984) the morphologically simple forms from which the COS-denoting words are derived anyway, so the question is moot in those cases. For the data in (31), however, the question does arise and according to Kaufman (p.c.), consistent with the predictions of the MH the form in (31a) names a property concept state and not a result state. According to Kaufman, (31a) has no implication that there was a prior event of disappearing giving rise to the state of non-existence denoted by the word. There *could* be such an event, he says, but it is not entailed. Instead, in order to have an entailment of a prior event giving rise to the state, a completely different form is used, a form based on the same root, but prefixed with what Kaufman says are both stative and perfective prefixes, as shown in (32).

(32) na-wala
STATE.PRF-not.be
'disappeared' (Kaufman, p.c.)

Thus, while (31a) is the form naming the property concept state of non-existence, the form in (32) is the one naming a result state based on the same root. Consistent with the predictions of the MH, then, the form naming the property concept state is morphologically simple, while the form naming the result state is derived. Contrary to initial appearances, then, based on the data and glosses in Foley and Van Valin (1984), it is not the case that words naming changes of state are derived from words naming result states in Tagalog. Instead, although the facts are somewhat more complicated, Tagalog behaves just as the other languages discussed above.

The same kind of situation may hold in the Dyalnuy 'mother-in-law' variety of Dyirbal documented by Dixon (1972, 1982:Chapter two). While in the everyday Guwal variety of Dyirbal there are completely separate lexemes naming what appear to be on the basis of the gloss a result state "broken" and a transitive COS verb "break", in Dyalnuy the lexemes naming these two notions share a morphological root and are derivationally related to one another, in a way such that the transitive COS verb is derived from the state-denoting adjective (Dixon 1982:51, fn. 57; 54). This is illustrated by the data in (33).

(33) "split/break" in the Guwal and Dyalnuy varieties of Dyirbal (Dixon 1972:313)

	Guwal	Dyalnuy	
transitive verb	rulbal	yilgil-mal	'(to) split'
adjective	yagi	yilgil	'broken, split'

According to Dixon, in the Dyalnuy variety the transitive/causative verb is derived from the adjective by a productive word-formation process (Dixon 1982:51, fn. 57; 54). If it is true, then, that *yilgil* actually has a result state meaning, then the word formation process that derives the transitive/causative verb from it would be, like the putative Tagalog counterpart discussed above, one that removes an existential operator from a lexical semantic representation, and re-lambda-abstracts over the event argument. The odds are good, however, that *yilgil*, like its Tagalog counterparts, does not have a purely result state meaning. Dixon (1982:313) observes that lexemes in Dyalnuy are highly polysemous, and cover a much wider range of meanings than do their Guwal counterparts. Although he doesn't comment on the situation with *yilgil*, he does note, for example, that "... at least fifty adjectives and verbs in Guwal have *mangay*, *mangaybil*, or *mangaymal* as their Dyalnuy correspondents. They cover 'stale', 'deaf or forgetful', 'lazy', 'tired', 'shaky', 'coarse (not finely ground)', 'cunning', 'cheeky', 'frightened', 'broken-hearted or offended', 'ashamed', 'stupid', 'grumble at', 'feel ill', etc. etc" (Dixon 1972:313). Thus, even if the Guwal *yagi* does have a result state meaning, if the polysemy claimed by Dixon to hold quite generally of lexemes in Dyalnuy holds for *yilgil*, then it most likely does not have a simple result state meaning, but a much more underspecified meaning, most likely with multiple senses. This, of course, would be nice to investigate further.

The conclusion for result states, then, is that it seems that words with this kind of denotation are derived from words naming the COS events entailed by the result state words to give rise to the result state. It does not seem to be the case, by contrast, that a COS verb can be derived from a word naming the state resulting from that event. This is precisely the derivational relationship predicted by the MH. More broadly, this discussion reinforces two ideas. First, derivational relationships are not always immediately apparent from superficial investigation. Secondly, as observed by Levin and Rappaport Hovav (1995), a great deal of care is required in making any claims about the semantics of a particular word based on the meaning of its English gloss. In the same way that that Levin and Rappaport Hovav (1995) observed that this led Rosen (1984) to erroneous conclusions in her crosslinguistic investigation of the semantic underpinnings of unaccusativity, the same strategy, as observed here, could lead to false counterevidence in evaluation of the MH. In particular, special care must be taken to determine whether a particular state denoting word names a property concept state or a result state, and it may not always be the case that English has a suitable word for glossing these.

3.5.2 Words naming property concept states are underived?

Turning now to words naming property concept states, the data discussed in the sections above suggest that consistent with the prediction of the MH in (19a), words naming property concept states are never derived from words naming changes into property concept states. The same holds for other languages I have not discussed above, such as Warlpiri (Hale and Keyser 1998:93), Spanish, English (Dixon 1982), Central Alaskan Yup'ik (Jacobson 1984, 1995), Cora (Vázquez Soto 2001), and other Polynesian languages like Maori (Bauer 1993). As previously discussed, a derivational operation that derived a property concept denoting word from a COS-denoting word would involve a derivational operation whose semantic effect would be the deletion of operators, minimally a BECOME operator if not also a CAUSE operator, in violation of the MH. It is noteworthy, then, that in data from genetically diverse languages such operations are not found. Indeed, the observation that words naming property concept states are morphologically simple seems such an obvious conclusion that it is hard to imagine that things could be any different. This intuition, however, has previously received no explanation. It follows as a direct consequence of the MH. Indeed, if the MH is correct, it could not be any other way.

In light of this fact, certain data from the endangered Misumalpan language Ulwa are noteworthy. In Ulwa, words naming property concept states appear to be derived from causative COS-denoting roots. This is illustrated by the table in (34).

(34) Ulwa states and changes of state (my fieldnotes; Green 1999; Hale and Salamanca 2002; Koontz-Garboden 2006b,c)

	property concept	non-causative COS	causative COS	
a.	sang-ka	sang-da–	sang–	green/blue
b.	yûh-ka	yûh-da–	yûh–	long, tall
c.	baras-ka	baras-da–	baras–	black
d.	bara-ka	bara-da–	bara–	dark
e.	sik-ka	sik-wa–	sik–	large
f.	warin-ka	warin-da–	warin–	bent

In Ulwa, words naming property concept states are morphologically derived from roots via a *–ka* suffix. The nature of the Ulwa verbal system, as discussed in Chapter 5 is such that it appears as though these roots name causative COS events. The conclusion that one is led to, then, is that Ulwa property concept words are derived from COS-denoting roots, in violation of the MH's prediction in (19a). In Chapters 5 and 6, I undertake a detailed investigation of words naming property concept states and changes of state in Ulwa to untangle what is going on in the language. In the end, I show that the derivation marked by *–ka* is, in fact, not one that derives a property concept state denoting word from a COS-denoting root, but instead one that does not effect a change in the meaning of the root. Its function is to derive nouns from bound roots. Demonstrating this, however, requires much more knowledge than can be discerned from the table in (34). The focus of Chapters 5 and 6 is to make the case that this is indeed the function of *–ka*, and that the Ulwa facts do not, by consequence, counterexemplify the MH.

3.6 Concluding remarks

In this chapter I have laid out several predictions regarding the derivational relationship between words naming states and words naming changes of state. I began by showing that there are two different types of states, whose consideration bears on the predictions of the MH. While result states entail that there was an event giving rise to the state, property concept states do not. Given this difference in lexical semantics, the MH makes clear, falsifiable predictions regarding the derivational relationship of words naming such states to words naming changes of state. These are summarized in (35).

(35) Two predicted asymmetries in word formation

a. Words naming changes of state can never be derived from words naming result states.

b. Words naming property concept states can never be derived from words naming changes of state.

These two types of derivational operation would be ones that would result in the deletion of lexical semantic operators, in violation of the MH. It is telling then, pending further discussion of Ulwa in Chapters 5 and 6, that such derivations do not seem to be found crosslinguistically. In the cases where languages appear to have such derivations, as I showed in the case of Tagalog in this chapter and as I show in the case of Ulwa in the chapters that follow, something else is going on, obscuring the derivational relationship in a way such that, despite initial appearances, it is not the case that the MH is violated. Instead, it is indeed the case that word formation operations are constrained by the MH, leading to asymmetries in direction of derivation between words with meanings that are built on one another—lexical semantic operators may be added by a word formation operation, but never removed.

Chapter 4

Ulwa: A brief introduction

4.1 Introduction

As discussed in the previous chapter, the Monotonicity Hypothesis leads to the prediction that words naming property concepts should never be derived from words naming changes of state.[1] Data from a number of languages support this general prediction. It seems, in fact, to be such a strong generalization that words naming property concepts are never derived from words naming changes into those states that counterexamples are indeed hard to find. This asymmetry in the derivational relationship between words naming property concepts and words naming changes into those states offers strong support for the MH, given the decompositional representations of property concept states and changes of state reviewed in Chapter 2.

One language that has, however, surfaced as an apparent counterexample to the prediction of the MH that words naming states are never derived from words naming changes of state is Ulwa, an endangered Misumalpan language spoken in the village of Karawala on Nicaragua's Atlantic coast. According to the description of COS verbs in Ulwa laid out by Hale and Salamanca (2002) and Hale and Keyser (2002), the relationship between words naming property concepts and words naming changes into those

[1]This chapter and the ones that follow would not have been possible without the initial work of Tom Green, in particular without the electronic version of the Ulwa dictionary which he graciously shared with me.

states is as in the table in (1).

(1) Ulwa (Hale and Keyser 2002:122-123)

prop. concept	non-causative COS	causative COS	gloss
sang-ka	sang-da	sang-pa	'green/blue'
yûh-ka	yûh-da	yûh-pa	'long, tall'
baras-ka	baras-da	baras-pa	'black, dark'

Based on the facts as presented in the work of Hale and his colleagues, it appears as though in Ulwa states, inchoatives, and causatives are all derived from some more abstract root by different suffixes marking each of these derivations. This kind of pattern is not immediate counterevidence for the MH; its consistency with the MH depends on both the nature of the meaning of the root and the nature of the derivations operating on the meaning of the root. In particular, if each of the suffixes derives a stem with altered meaning, one has to wonder what the meaning of the underlying root is and whether the derivations from it to states and changes of state are consistent with the MH.

Further investigation suggests that the situation in Ulwa is, in fact, even more interesting than initially suggested by Hale and colleagues (Hale and Salamanca 2002; Hale and Keyser 2002). I show in Chapter 5 based on additional data on the Ulwa verb class system that suffixes like *–pa–* in (1), contrary to claims by Hale and colleagues, are not derivational suffixes that alter the meaning of the root to which they suffix; they perform no meaning altering derivation on a root, instead deriving a verbal stem from a bound (apparently precategorial) root. This finding makes the relationship between states and changes of state in Ulwa appear like a proper counterexample to the MH. Instead of looking as if states and changes of state are all derived from a more abstract root as in (1), the finding that suffixes like *–pa–* do not mark a meaning altering derivation makes the system appear as one in which words naming property concepts and non-causative changes into those states are derived from causative COS denoting roots. This is illustrated in (2).

(2) Ulwa states and changes of state (my fieldnotes; Green 1999; Hale and Salamanca 2002; Koontz-Garboden 2006c, 2006d)

	property concept	non-causative COS	causative COS	
a.	sang-ka	sang-da–	sang–	'green/blue'
b.	yûh-ka	yûh-da–	yûh–	'long, tall'
c.	baras-ka	baras-da–	baras–	'black'
d.	bara-ka	bara-da–	bara–	'dark'
e.	sik-ka	sik-wa–	sik–	'large'
f.	warin-ka	warin-da–	warin–	'bent'

This finding is taken as the point of departure for a full-scale investigation of the *–ka* suffix in Chapter 6, where I ultimately show that the derivation marked by *–ka* is not one that alters the lexical semantics of the root to which it suffixes and not one that violates the MH. Instead, the *–ka* suffix has lexical category altering functions, deriving a noun from a property concept state denoting precategorial root. An additional zero-marked derivation is responsible for the fact that the COS denoting root is morphologically unmarked. Before getting to this point, however, I introduce background information on Ulwa and its grammar in this chapter, following this by the full-scale re-evaluation of the Ulwa verb class system in Chapter 5 which leads to the picture painted by the table in (2). Only then do I undertake the investigation of the Ulwa *–ka* suffix in Chapter 6.

I begin first by surveying previous work on Ulwa, approaches that have been taken to its study, and how my work fits into this broader context. I then go on to review certain salient aspects of the grammar of the language, following this by concluding remarks.

4.2 Previous work on Ulwa and sources of data

Although some linguistic work (largely word-lists) had been carried out on Ulwa around the early 1900s (see Green 1999:Chapter 1 for a review) it was Ken Hale, Tom Green, and their colleagues that began in the late 1980s to work on serious documentation of the language in collaboration with members of the Ulwa speaking community. To date, there have been several articles and chapters discussing the verbal morphology of the language (Hale and Salamanca 2002; Hale and Keyser 2002), verb chaining constructions in Ulwa and Misumalpan more generally (Hale 1991b, 1997), an overview paper considering the relationship of Ulwa to its sister language Mayangna (Benedicto and Hale 2000), as well as a sketch grammar and dictionary (Green 1999). This work was all carried out in the context of the Ulwa Language Project, a grassroots language documentation project founded by members of the Ulwa speaking community of Karawala concerned about the loss of their language.[2]

The research on Ulwa reported in this chapter draws on data from this previous work in addition to my own fieldwork. The bulk of this fieldwork was carried out over an eleven month period from August, 2004–July, 2005 during which time I was in residence in Karawala. An additional fieldtrip to Karawala was carried out in March, 2006 to collect additional data. Thus, in addition to the rich dictionary and sketch grammar of Green (1999) and the analyses of Hale and others, I also draw on my own work on the language, comprising well over one thousand pages of notes, many of which have been integrated with the electronic version of the Ulwa dictionary.

My approach to fieldwork on Ulwa, has been heavily influenced by the approaches taken by my predecessors in Karawala, Ken Hale and Tom Green. As discussed in Koontz-Garboden (2006a), the hallmarks of their approach to work on Ulwa as I see it have been: (a) participatory research, (b) focus on the lexicon, and (c) monolingual fieldwork.

The participatory approach and the focus on the lexicon, it seems to me, go hand in hand. Hale and Green trained native Ulwa speakers to document their own language by focusing on individual lexemes, creating their own example sentences for lexemes not yet appearing in the dictionary. These example sentences illustrate far more than just the individual lexemes they are meant to exemplify. Indeed, they are a rich source of naturally occurring example sentences that can be exploited for study of other aspects of the grammar of the language. I have found this approach to studying the language to be a fruitful one. Although I make occasional use of acceptability judgements in the discussion below, my main source of data on the language comes from sentences

[2]For a history of the Ulwa Language Project see Green and Hale (1998), Green (1999:chapter 1), Hale (1991a, 2001), and Koontz-Garboden (2006a) for more recent activities of the project.

constructed by the Ulwa speakers themselves in an effort to illustrate individual lexemes. This allows not only for the creation of a naturally occurring example, in a sense, but also allows the linguist to ask questions such as whether the sentence they created would still be acceptable Ulwa if particular aspects of it were altered. In general, when I cite acceptability judgements for sentences, it is acceptability judgements that have been collected in this manner.

The final imprint left by Hale and Green on the linguistic research setting in Karawala is a monolingual approach to fieldwork. Although my initial research with members of the Ulwa Language Project was carried out in Spanish, I was expected by the Ulwa speakers to learn Ulwa as quickly as possible in order to work with them in their own language, as did Hale and Green before me. Once this happened, not only was I able to work with Ulwa speakers who do not know any Spanish (which is important, since these are often some of the best speakers of the language), but the quality of the work even with speakers who do know Spanish improved markedly. Additionally, like Hale and Green before me, the monolingual approach made it possible for me to interact with the community and to collect naturally occurring examples of Ulwa of theoretical interest as I went about my business in Karawala.[3] Example sentences marked "naturally occurring" are ones collected in this way—i.e., they were overheard, not elicited even in the manner laid out above.

Thus, the Ulwa data in the discussion that follows come from several sources: (a) the Ulwa dictionary (Green 1999), (b) sentences constructed by Ulwa speakers upon request for an example sentence illustrating a particular lexeme, (c) changes made by me to these naturally occurring examples in order to elicit a judgement on a slightly altered sentence, (d) for very simple illustrations of a particular point to avoid unnecessary obfuscation of the main point, sentences or phrases constructed by me based on my knowledge of the language, and (e) naturally occurring examples overheard in the community.

[3]For additional discussion of the advantages of a monolingual approach to linguistic fieldwork, especially in cultural contexts not unlike that of Karawala, see Everett (2001).

4.3 Background on Ulwa grammar

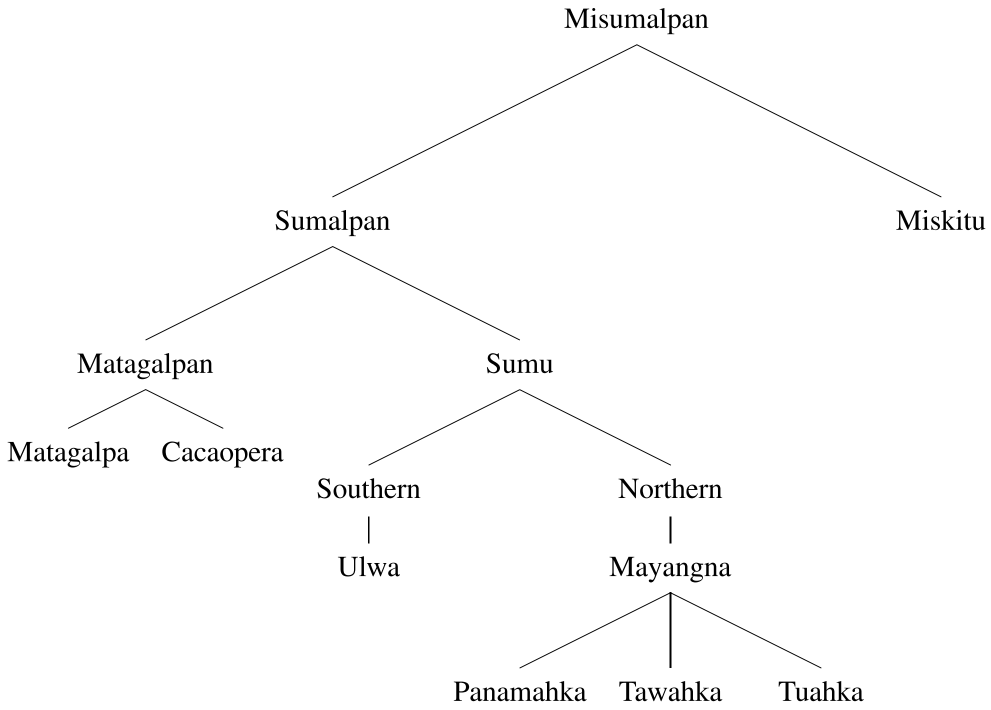
In the sections that follow, I briefly situate Ulwa in the broader context of Misumalpan more generally. I then go on to briefly lay out some of its grammatical characteristics that will be important in the discussion that follows.

4.3.1 Ulwa in the context of Misumalpan more broadly

Ulwa is spoken by approximately 350 adults (Green 1999:18) in the village of Karawala, on Nicaragua's Atlantic coast and is an uncontroversial member of the Misumalpan family, a family name formed by the concatenation of the the sub-family names of its members, Miskitu, Sumu, and Matagalpan. Ulwa belongs to the Sumu subfamily, which itself has two members, Northern Sumu, generally known by the name *Mayangna* and Southern Sumu, or Ulwa. Northern Sumu is considered to have three separate, but mutually comprehensible dialects, *Panamahka*, *Tawahka*, and *Tuahka* (Benedicto and Hale 2000). By contrast, Ulwa and these dialects are not mutually comprehensible.[4] The Sumu languages, in turn, are generally grouped together in a larger sub-family along with the now-extinct Matagalpan languages. It is only more distantly that these languages are presumed to be related to Miskitu (Campbell 1997:167; Benedicto and Hale 2000). These relationships are illustrated by the family tree in (3).

[4] For example, although I managed to become a reasonably fluent speaker of Ulwa in my time in the field, Mayangna is incomprehensible to me. Likewise, for a native Karawalan Ulwa speaker, unless they were raised by a Mayangna speaking parent, or for some other reason had access to Mayangna, they do not generally understand the language, nor is Ulwa accessible to Mayangna speakers who have not acquired it. Mayangna and Ulwa are not dialects of the same language.

(3) Misumalpan family tree (Benedicto and Hale 2000:93)



Beyond the languages illustrated in (3), it is sometimes claimed, not only by Greenberg (1987) but others as well, that the Misumalpan languages are related to the Chibchan languages, forming a larger family called *Macro-Chibchan*, in part based on the fact that uncontroversial Chibchan languages extend at least that far to the north, as with the moribund Chibchan language Rama (Craig 1990), also spoken on Nicaragua's Atlantic coast. Little systematic work has been carried out to substantiate this claim (though see Craig and Hale 1992). The idea is, nevertheless, not generally viewed as entirely implausible (Constenla Umaña 1991: 29; Campbell 1997: 326).

4.3.2 Verb chaining

According to Longacre (1985:238) crosslinguistically languages use two very different methods for putting clauses together into a single sentence. Indo-European languages like English have what Longacre calls a "co-ranking" system, whereby verbs of two equal morphosyntactic rank are conjoined by some particle, like *and* (Longacre

1985:238). To understand what exactly is meant by this, consider the Spanish data in (4).

(4) a. Kim pegó a Kelly.
Kim hit to Kelly
'Kim hit Kelly.'

b. Kelly se murió.
Kelly REFL died
'Kelly died.'

c. Kim pegó a Kelly y ella/el se murió.
Kim hit to Kelly and she/he REFL died
'Kim hit Kelly and s/he died.'

The verbs *pegó* 'hit' and *se murió* 'died' in (4) are both the heads of independent sentences in (4a) and (4b). When the two clauses are conjoined together into the same sentence in (4c) with the conjunction *y* 'and' their morphosyntactic shape does not change—a verb in an independent clause has the same morphosyntactic status whether in an independent sentence or whether conjoined together with another clause.

By contrast, there are languages that put clauses together in a very different fashion, in a way dubbed "chaining" by Longacre (1985:238). In such languages when clauses are put together, one of the verbs in the sentence is treated as the matrix verb, the others having a kind of morphosyntactic subordinate status, being parasitic morphosyntactically on the matrix verb for some of their morphosyntactic features like person, number, tense, etc. Ulwa, like Miskitu and Mayangna (Hale 1991b, 1997), is a "chaining" language, as illustrated by the data in (5).

(5) a. Kim laih Kelly kau bau-t-ida.
Kim TOP Kelly at hit-TA-3SING.PAST
'Kim hit Kelly.'

b. Kelly laih î-w-ida.
Kelly TOP die-WA-3SING.PAST
'Kelly died.'

c. Kim laih Kelly kau bau-t-ak î-w-ida.
Kim TOP Kelly at hit-TA-3SING.DS die-WA-3SING.PAST
'Kim hit Kelly$_i$ and s/he$_i$ died.'

d. Kim laih Kelly kau bau-t-i î-w-ida.
Kim TOP Kelly at hit-TA-SS die-WA-3SING.PAST
'Kim$_i$ hit Kelly and s/he$_i$ died.'

What the data in (5) reveal is that when a clause is an independent sentence with one verb and not coordinated with any other clause, the verb gets particular morphological marking, in particular being marked for person, number, and tense, as shown in (5a,b). By contrast, when the clause is coordinated with another clause, only one of the verbs is marked for tense, and depending on the nature of the coordination, only one may be marked for person and number. The sentence in (5c) is one in which the subject of the first clause is different from the subject in the second clause, as indicated by the morphology on the verb *bautak* 'hit'. The suffix *–ak* indicates that the subject of that verb is third person singular, and is different from the subject of the following clause. By contrast, in (5d), the subject of both verbs is the same, as indicated by the suffix *–i* on *bauti* 'hit'. In cases where the subject of one clause is the same of the subject of the next, not only the tense comes from the final verb, but the person and number as well.[5]

As discussed by Hale (1991b, 1997) and Green (1999), the verb chaining system gets co-opted for other purposes in Ulwa. First, as is common with verb chaining systems more generally (Longacre 1985), the system is used in Ulwa for the expression of causative relations, so that (5c), for example, means that Kim's hitting Kelly is what caused Kelly to die. That is, (5c), I believe,[6] would be odd in a situation in which Kim hit Kelly and Kelly died from an unrelated gunshot wound. Young and Givón (1990),

[5]For more formal discussion of these kinds of "chaining" systems of clause coordination in Misumalpan, see Hale (1991b, 1997). Green (1999:chapter 7) also has a useful overview of the Ulwa facts. For a more general discussion of what is going on formally in switch reference systems see Finer (1984) and Stirling (1993).

[6]I have not checked this with a native speaker; the claim about this particular data point is based on my understanding of how these constructions are used on the basis of learning how to use them. See Hale (1991b,1997) for similar discussion.

Craig and Hale (1992), and Hale (1991b,1997) discuss the facts of these causative constructions in Misumalpan and Chibchan more broadly, some of them quite typologically marked, in great detail, and although much more work is needed, I have nothing to add to that discussion here.

Additionally, as noted by Green (1999:110ff.), the verb chaining construction is also used in order to disambiguate grammatical relations in cases where they would otherwise be unclear. Such a use of the verb chaining construction is exemplified by the data in (6).

(6) Âka pan-ka âka lapnih rau-p-i pah-t-i abal-t-ida.
this tree-3SING this lightning RAUPI-PA-SS shoot-TA-SS destroy-TA-3SING.PAST
'A bolt of lightning destroyed this tree.' (Green 1999:111)

The verb *raupi* in (6) is a defective intransitive verb which exists only in the same-subject form and has no real semantic content so far as I (or Green 1999) have been able to tell. Instead, its function is purely morphosyntactic. Because its same-subject form indicates that its subject is the subject of the following clause, this verb form marks its subject as the subject of the following clause when this might be in doubt, as in clauses, for example, where both arguments of a transitive verb are third person singular, as is the case in (6).

In addition to what seems to be the purely subject marking function of *raupi* illustrated by the data in (6), there is another use of *raupi* revealed by recent fieldwork that has previously gone unnoticed and perhaps challenges the belief expressed above that it is completely semantically empty. The data in (7) illustrate the use of *raupi* as a marker of a natural force causer with a verb that otherwise takes only a single argument.

(7) a. Isamh-da-yang.
sneeze-DA-1SING.PRES
'I sneeze.'

b. *Nanghtak yâ isamh-d-ai.
cold 1SING.NON-NOM sneeze-DA-3SING.PRES
'The/a cold makes me sneeze.' (notes, 1043)

c. Nanghtak raupi isamh-da-yang.
cold RAUPI sneeze-DA-1SING.PRES
'The/a cold made me sneeze.' (notes, 1043)

d. *Nanghtak raupak isamh-da-yang.
cold RAUPI.3SING.DS sneeze.DA.1SING.PRES
'The/a cold makes me sneeze.' (no explicit rejection, but never heard)

The sentence in (7a) illustrates the fact that the verb *isamhdanaka* 'sneeze' is intransitive, taking a single argument. This is further illustrated by the sentence in (7b), which shows that the verb is unacceptable in a transitive frame where the sneezer is named by an accusative pronoun and the subject of the construction (as evidenced by third person verbal agreement) is a natural force such as a cold. In light of this observation and of the description of *raupi* laid out above, then, the data in (7c) are surprising—they show that if accompanied by *raupi*, *nanghtak* 'a cold' can indeed be specified as the causer of the sneezing event. Interestingly, however, verbal agreement is with the sneezer, not with the causer, as evidenced in (7c) by the fact that the verb is inflected for first person singular agreement, rather than third person singular agreement. Even more interesting is the fact that this use of *raupi* actually would seem to violate the generalization that the inflectional suffix *–i* is used in cases of same-subject verb chaining—the subject of *raupi*, *nanghtak* 'a cold', does not seem to be the subject of *isamhdayang* 'I sneeze', at least if subject/verb agreement is to be trusted.[7] The construction that would be expected

[7]This kind of mismatch between switch reference marking and verbal agreement in general is rather rare, since much discourse involves two third person singular participants. Even when one of them is plural, there are certain paradigm gaps in third person verbal morphology that make it unclear whether verbal agreement is with one or the other. The contrast surfaces most clearly, then, when there is a first or second person participant. These are rarer in discourse, but do, of course occur. Another naturally occurring example is given in (i) (with *raudi* in place of *raupi*, the two being interchangeable, as noted by Green 1999:111).

(i) Daih-ka raudi ama-ni-ki wal-ta-sing, yâ-ka dî-ka karak.
hot-ADJ RAUPI sleep-INF-1SING want-TA-1SING.NEG that thing-3SING with
'The heat makes it so that I do not want to sleep with that thing.' (speaker referring to a mosquito net; notes, 1102)

to be found for expression of the meaning expressed by (7c), on the basis of our general knowledge about switch reference marking in Misumalpan, is instead (7d), where *raupi*, rather than having same-subject marking, instead has different-subject marking. The form *raupak*, however, seems to be entirely unattested in this kind of use; although I have not tried to elicit it from any speaker of Ulwa, I have certainly never heard it. By contrast, however, if *raupi* is replaced by another verb, in particular the verb *ânaka* 'cause/give', generally used in the language for periphrastic causative constructions, it is indeed the case that different-subject switch reference marking is used, as illustrated by the data in (8).

(8) Nanghtak y-â-tak isamh-da-yang.
cold 1SING.NON-NOM-cause-3SING.DS sneeze-DA-1SING.PRES
'The/cold makes me sneeze.' (notes, 1043)

What seems to be the case, then, is that *raupi* has become lexicalized and has uses that go beyond the expected and widely attested use as a marker of subjecthood with other clauses in the same sentence. Its use seems to have extended to the marking of causation, at least when the cause is a natural force. Future work is needed to further untangle both the facts of *raupi* and its consequences for the analysis of switch reference in the language more broadly.

Moving beyond the facts of *raupi*, what I have shown in this section is simply that Ulwa has a chaining system of clause coordination with special marking appearing on coordinated verbs according to whether they share or do not share a subject with the following clause. This system gets extended in various ways, being used not only for causative constructions but also for disambiguation of grammatical relations.

4.3.3 Nominal possession

As discussed shortly below, and at length in Chapter 6, the nominal possessive paradigm is implicated in the morphological shape of words naming property concept states in Ulwa. In this section I give a very brief overview of possessive marking in the nominal domain.

In Ulwa, and Misumalpan more generally, nominal possession is marked on the head noun, as illustrated by the data in (9).

(9) Andrew wahai-**ka**
Andrew brother-3SING
'Andrew's brother'

The head noun agrees in both person and number with the possessed, as illustrated by the data in (10).

(10) a. yang wahai-**ki**
1SING brother-1SING
'My brother'
b. Manna balna tulh-**mana**
2PL PL machete-2PL
'Your (pl.) machetes'

The fact that the possessed agrees with the possessor in both person and number is further illustrated by the table in (11), which gives the full nominal possessive paradigm in the language.

(11) Nominal possessive paradigm (Green 1999:78)

1SING	–ki	1PL.EXCL	–ki-na
2SING	–ma	2PL	–ma-na
3SING	**–ka**	3PL	–ka-na
		1PL.INCL	–ni

As can be seen in (11), the marker of third person singular possession in the nominal domain is *–ka*, the same suffix that appears on words naming property concept states. This fact is discussed at length in Chapter 6.

4.3.4 Non-verbal predication

Unlike verbs, non-verbal predicates in Ulwa require additional morphosyntactic modification in order to be predicated of an argument. The basic morphosyntactic contrast, leaving aside contrasts in meaning, is illustrated by the minimal pair in (12), (12a) containing a verbal predicate and (12b) containing a non-verbal predicate based on the same root as the verb in (12a).

(12) a. Âkalah lau-wa-yang.
here sit-WA-1SING.PRES
'I'm sitting down here.'
b. Âkalah lau yang.
here sit 1SING
'I'm sitting here/I am (over) here.'

The basic observation is that while the person and number features are included in the verbal inflections, they are not for non-verbal predicates (though the phonological shape of person/number morphology is similar for some person/number combinations for both non-verbal and verbal predicates). The pattern in (12b), illustrated there with a predicate from the special set of posture predicates (called "statives" by Green 1999), is the same one used for nominal and property concept state predicates, as shown by the data in (13), (13a) for a nominal predicate and (13b) for a property concept state predicate.

(13) a. Tunak muih-ka as yang.
head person-3SING one 1SING
'I am a community leader (member of the council of elders).'
b. Babar-ka yang.
thin-ADJ 1SING
'I am thin.'

The constructions in (13), and all non-verbal predications like them, are interpreted as holding of the present. In order to situate them in either the past or future, additional copular material is required, as illustrated in (14a) for the past and (14b) for the future.

(14) a. Babar-ka yang dai.
thin-ADJ 1SING PAST
'I was thin.'

b. Babar-ka at-kuting.
thin-ADJ be-1SING.FUT
'I will be thin.'

The way in which tense marking is achieved with non-verbal predication differs, as can be seen in (14), according to tense. With the past tense, the defective auxiliary *dai* is used, which has only third person forms in the past as in (14a) and in the perfect, as further discussed in Green (1999:138). In the future, the copular verb *atnaka* 'be' is used, as illustrated in (14b). Unlike the defective *dai*, *atnaka* is a full-fledged verb and can take both person and number inflection. Because of this, when used in place of *dai* in the future (and some related tenses/moods like the conditional), the person/number copula *yang* is not used, person agreement being encoded directly in the inflectional morphology (see Green 1999:chapter 8 for additional discussion).

In tenses where the person/number copula (*yang* in (14a)) is used, the form of the copular element varies according to person and number, with the form for the third person, whether singular or plural, being null (pending discussion below on *ka*). The table in (15) gives the full paradigm for person/number, with some examples of third person non-verbal predicative constructions in (16).

(15) Person/number copula markers (Green 1999:136)

1sing	yang	1pl.excl	yangna
		1pl.incl	yak
2sing	man	2pl	manna
3sing	—	3pl	—

(16) a. Kusih-ki ya babar-ka (ka).
pig-1SING the thin-ADJ (SENT-KA)
'My pig is thin.'

b. Kusih-ki balna ya babar-ka (ka).
pig-1SING PL the thin-ADJ (SENT-KA)
'My pigs are thin.'

As illustrated by the examples in (16), there is no overt agreement in person or number when the non-verbal predicate is predicated of a third person argument, whether singular as in (16a), or plural as in (16b). The examples in (16) further illustrate the fact that with words naming property concept states the property concept state word is suffixed with a *–ka*, which I gloss as ADJ, since this marker shows up on words that are adjectives in other languages (see Chapter 6 for further discussion). Additionally, there is also another optional *ka*, whose presence has previously been understood as having complementizer-type functions (Green 1999:140). I have more to say about this *ka* in §4.3.5, showing that in many cases it has functions characteristic of evidentiality.

A final complication that should be pointed out is that with the special class of posture predicates (Green 1999:140), number agreement is encoded in the predicate itself, there being separate lexemes for singular and plural. This is illustrated by the data in (17), where *lau* 'sit' is used with a singular subject in (17a) and *bang* 'sit' is used with a plural subject in (17b).

(17) a. Baka-ki yal yâlah lau ka.
child-1SING girl there sit SENT-KA
'My female child is (sitting) over there.'

b. Baka-ki balna yâlah bang ka.
child-1SING PL there sit.PL SENT-KA
'My children are (sitting) over there.'

An additional observation worth mentioning is that by contrast with the words naming property concept states in (16), with posture predicates like the ones in (17), the sentential *ka* particle is obligatory.

4.3.5 The three morphemes *–ka*

In the previous discussion it will have become apparent that there are several morphemes with the phonological shape *ka* in Ulwa. Given that the ultimate goal of this discussion is to untangle the nature of the suffix appearing on property concept words in Ulwa, and given that this marker is one of those that has the phonological shape of *ka*, it is worth considering the nature of the other *ka* morphemes. Discussion of the property concept word marker *ka* and its relation to the nominal possessive marker (third singular) *–ka*, already introduced above in §4.3.3, is delayed until Chapter 6. In this section I detail facts related to what I have been calling sentential *ka*. This *ka* is unrelated, I believe, to the matters at hand, but in order to demonstrate this, I lay the facts of it out here. At the same time, this discussion serves the purpose of providing a first preliminary description of what the grammatical function of this element is.

As already discussed above in §4.3.4, in Ulwa both nouns and property concept state words can be used predicatively, with copular support. Copular support is also needed with "stative verbs," which are mostly posture predicates (sitting, standing, floating, hanging, etc.), but also some others like the modals *it* 'be possible' and *sip* 'be possible'. Each of these three types of predicate is illustrated in (18) in a first or second person context.

(18) a. Mining muih yak.
1PL.INCL human COP.1PL.INCL
'We are human.' (Green 1999:137)

b. Babar-ka yang.
thin-ADJ COP.1SING
'I am thin.'

c. Lau man.
sit COP.2SING
'You are sitting.'

The entire copular paradigm, given in (15), is repeated in (19).

(19) Marking of non-verbal predicates

	singular	plural
1st person	yang	yangna (exclusive)
		yak (inclusive)
2nd person	man	manna
3rd person	–	–

A salient feature of the paradigm in (19), and a feature that is of primary concern in this section, is the previously mentioned fact that the 3rd person inflection of the Ulwa copula is null. Despite this, 3rd person copular constructions do not show up completely bare, void of anything other than the predicate and its subject. Instead, an additional element, what Green (1999) calls *sentential ka*, appears. Some examples are given in (20).

(20) a. Wahai-ki ya lau **ka**.
male's.brother-1SING DEF sit SENT.KA
'My brother is sitting.'

b. Andrew ya as-ka-na suh-p-i sak **ka**.
Andrew DEF clothing-<3SING> wash-PA-SS stand SENT.KA
'Andrew is standing washing his clothes.'

c. Ami-ki ya auh-ka **ka**.
sister-1SING DEF fat-ADJ SENT.KA
'My sister is fat.'

Initially, it would appear that the sentential *ka* in sentences such as those in (20) is actually the 3rd person manifestation of the Ulwa copula. There are several arguments against this position, however.

First, sentential *ka* is sometimes used in non-copular-verb contexts. In these cases, it can appear alongside a verb that has a non-third person subject. Some examples are given in (21).

(21) a. Yang laih walta-sing **ka**, kal bau-dai.
I TOP want-1SING.NEG SENT.KA RECIP fight.3PL

‘I do not like it, their fighting with one another.’ (notes, 674; naturally occurring)

b. Yang laih wilih lipin-ka kas-sing (**ka**).
I TOP green.turtle fin-3SING eat-1SING.NEG SENT.KA
‘I don’t eat green turtle fins.’ (Green 1999:139)

c. Dî ing-ka ya bai kaupak tal-wai **ka**.
thing light-ADJ DEF far from see-1PL.INCL SENT.KA
‘Bright things can be seen from afar/We can see bright things from afar.’ (dict.)

Although the negative verbs in (21a,b) both have first person subjects, the matrix verb can appear alongside sentential *ka*.

In addition to the fact that sentential *ka* can appear in non-third person contexts with verbal predicates, though rare, it seems that even with non-verbal predicates, it may also be possible in non-third person contexts (contrary to claims in Green 1999:139)—the sentence in (22) is a naturally occurring example from the Ulwa dictionary.

(22) Mining it sa yak **ka**.
1PL.INCL can NEG COP.1PL.INCL SENT.KA
‘We can’t.’ (dict.)

The verb *it* ‘be possible’ belongs to the class of “stative verbs” in Ulwa that require copular support. In (22), though it appears with a first person inclusive subject, and with first person inclusive agreement, it still takes sentential *ka*. Like the data in (21), the data in (22) force the conclusion that *ka* serves some function other than that of a copular element.

An additional argument that sentential *ka* is not part of the copular paradigm comes from the fact that it cannot co-occur with question words, such as *pih*, while the first and second person copular elements can. The relevant data are given in (23).

(23) a. Lau **man** **pih**?
sit COP.2SING INTERR

'You're sitting?'

b. Andrew ya lau **pih**?
Andrew DEF sit INTERR
'Is Andrew here/sitting?'

c. *Andrew ya lau **ka pih**?

The sentence in (23a) shows that the second person copula can co-occur with the question marker *pih*, while (23b,c) show that this is not the case for sentential *ka*. This fact also suggests that sentential *ka* and the copular belong in different classes.

In addition to not co-occurring with the question marker *pih*, sentential *ka* also cannot appear next to an article, for example in an internally headed relative clause (IHRC) where the predicate of the IHRC might be expected to occur with sentential *ka*. This fact is illustrated by the data in (24).

(24) a. Yaka al-ka lau **ya** yâmak watah ka.
that man-3SING sit DEF farm has SENT.KA
'That man that's sitting there has a farm.'

b. Yaka al-ka lau **ka** yâmak watah ka.
that man-3SING sit SENT.KA farm has SENT.KA
'That man that's sitting there has a farm.'

c. *Yaka alka lau **ka ya** yâmak watah ka.

d. *Yaka alka lau **ya ka** yâmak watah ka.

Cf., second and third person copulas, which *can* occur with articles.

(25) a. Yâka tulh-ka watah **man ya** yai-ka pal-ka ka.
that machete-3SING have 2SING DEF sharp-ADJ very-ADJ SENT.KA
'That machete of yours if very sharp.' (notes, 756)

b. Âka kirit-ka watah **yang âka** walta-sa man?
this saw-3SING have 1SING this want-NEG 2SING
'Do you want this saw that I have?' (notes, 756)

These data lead to the conclusion that sentential *ka* is outside of the copular system of the language.[8]

Use of sentential *ka* is almost never required, so far as I can tell, whether used with a predicate adjective, noun, or full-fledged eventive verb.[9] This does not mean, however, that it fails to carry any meaning of its own. Nor is it the case that it can appear just anywhere. Indeed, as was discussed above, sentential *ka* cannot occur, among other places, in a sentence where the question word *pih* also appears. I believe there is a good reason for this—it seems that sentential *ka* occurs ("optionally") only in declarative sentences, where the speaker is asserting something. In fact, the data suggest that what sentential *ka* does is to indicate that the source of knowledge from which the assertion is derived is from direct personal experience/observation. Some examples illustrating this descriptive generalization follow.

A couple of boats arrive on a somewhat regular schedule in Karawala, delivering provisions, etc. for the town. One of the mainstay boats of Karawala life is called Doña Cándida (DC), named for the mestizo owner of the boat. DC's regular schedule is that she leaves the town of Bluefields on Friday mornings, arriving Karawala sometime on Saturday, and making it back to Bluefields on Monday evening. Despite this schedule, there are any number of factors that may cause her to arrive later, perhaps on Sunday, Monday, or later. Given this state of affairs, it is often the case that if someone is in Bluefields early in the week, say between Tuesday and Friday, they might go talk to DC herself to find out when she's leaving for Karawala (perhaps because they want to send something with her, etc.). This person that talked with DC, say on a Tuesday, might then take the Wednesday speedboat back to Karawala. Upon arriving in Karawala, people in town will want to hear news from this person, among other things, perhaps if the person spoke with DC regarding her plans for travel to Karawala. That said, consider now the two sentences in (26).

[8] This is the same conclusion reached by Green (1999), though without providing the arguments given here.

[9] As pointed out in footnote 10, there is a small set of predicates that do obligatorily take sentential *ka* in the present tense, predicates that Green (1999) calls "stative verbs". These are stance predicates, the predicate for 'have' and the predicate for 'be possible.' The name "verb" for members of this class may be a slight mischaracterization. Indeed, the fact that these predicates require copular support in predicational structures suggests that they are, in fact, non-verbal predicates.

(26) a. DC Saturday wâ-rang **ka**.
DC Saturday come-3SING.IRR SENT.KA
'DC will come Saturday.' (notes, 744)

b. DC Saturday wâ-rang.
DC Saturday come-3SING.IRR
'DC will come Saturday.' (notes, 744)

According to one of my consultants, (26a), with sentential *ka* could only be uttered by a person who has spoken directly with DC, e.g. when in Bluefields. The sentence in (26b), on the other hand, could be uttered by a random person in town who expects DC to come simply based on the fact that she generally (though not at all without fail) comes on Saturdays.

Similarly, most people in Karawala have no direct experience with snow, though I do. If we had, then, something like a workshop on snow, where I gave a lecture all about snow, and in particular how cold it is, in this workshop, I might utter something like (27).

(27) Snow ya dî rip-ka **ka**.
snow DEF thing cold-ADJ SENT.KA
'Snow is cold.' (notes, 744)

Though I can say (27), with sentential *ka*, according to one of my consultants, *he* could not say it, e.g. in reporting what he learned at the workshop back to his family members. Instead, he would have to say something like (28), with the quotative/reportative verb *atnaka*, appearing as *atdai*.

(28) Snow yaka dî rip-ka **at-dai**.
snow DEF thing cold-ADJ say-3PRES.PL
'They say that snow is cold.' (notes, 744)

The observation, again, is that sentential *ka* is used to mark an assertion for which the speaker has direct knowledge. If the speaker lacks such first-hand knowledge, then it cannot be used.

A final example involves some repairs at the Ulwa Language House. During the time the fieldwork reported on here was being carried out, there was an old frame of a desk there that needed a new surface. One of the members of the committee had the idea that we could use something like particle board to fix it up. My partner Melissa and I happened to have a random piece, so I took it over there, measured both it and the desk, and observed that it would be big enough to repair the desk. While taking a break with another consultant a couple of days after doing this, the consultant asked about the desk and the piece of particle board, in particular whether it was big enough to fit the desk. I responded with the sentence in (29), notably using sentential *ka*.

(29) Amang-ka **ka**.
enough-ADJ SENT.KA
'It is big enough.' (notes, 747)

Upon hearing this, she responded by asking if I had measured it, to which I responded that I had. We then went on to discuss the example in more detail. She told me that if I had measured the desk and board, then using (29), with sentential *ka* would be appropriate. She, on the other hand, since she had not measured the desk and board, could not respond with (29), even if it appeared to her that the particle board would be enough to get the job done; her response would have to be without sentential *ka*, or perhaps with another particle that hedges her response.

From what I can tell, sentential *ka* is not obligatory in cases of direct experience, but is used instead in cases where the speaker wants to make unambiguous the source of knowledge for his/her assertion.[10] My sense, then, is that declarative sentences without

[10]A possible exception to this statement is, again, with posture verbs, with which *ka* is obligatory, at least in matrix predicate sentences like (i).

(i) Kim laih lau *(ka).
Kim TOP sit SENT-KA
'Kim is here/there/sitting.'

This contrasts with the situation with words naming property concept predicates, for which sentential *ka* is optional in the same position (with the difference in meaning illustrated above), as shown in (ii).

sentential *ka* are underspecified for the speaker's source of knowledge in making the declaration, while a sentence *with* sentential *ka* has it unambiguously that the speaker has some direct source of knowledge for making the assertion.

To a first approximation, then, it would appear that sentential *ka* serves some kind of evidentiality marking function in the language. This would not be entirely surprising, given the fact that Ulwa does have at least one unambiguous marker of evidentiality, a verb form which can be used just in case the speaker's source of knowledge about the event named by the verb marked in this fashion is aural and not visual. This kind of verb form, which Green (1999:103) calls the audative, is illustrated by the data in (30).

(30) a. Wai kawa-**rî** sah?
who laugh-AUD IRREV
'Who on earth is that laughing?' (Green 1999:103)

b. Pauh-**tî** manah dai.
pound-AUD PLUR PAST.AUX
'One could hear them hammering.' (Green 1999:104)

Despite the existence of an unambiguous evidential in the language, it is not entirely clear that sentential *ka* is part of this system, as it appears to have other uses in the language which remain to be explored in detail, and which do not transparently have to do with evidentiality (e.g., its use with posture predicates). Some of these appear to be rather modal in nature, a category which is distinct but difficult to disentangle from evidentiality (Faller 2002:Chapter 3; Aikhenvald 2004). This is an exciting area in the grammar of Ulwa that requires much more research.

Although it cannot be said with absolute certainty exactly what the function of sentential *ka* is, the evidence discussed in this section, I believe, suggests that it can be

(ii) Kim laih babar-ka (ka).
Kim TOP thin-ADJ SENT-KA
'Kim is thin.'

It is unclear to me why there should be this difference; it is definitely something that should be pursued, in the context of further study of sentential *ka*, and more broadly, in the context of the grammar of evidentiality/modality in the language.

said with some degree of confidence that sentential *ka* has a function different from the nominal and property concept *ka* markers. While sentential *ka* seems to serve some kind of evidential/modal function, nominal and property concept *ka* serve a morphosyntactic function, as detailed in Chapter 6. In the remainder of the dissertation, then, I treat sentential *ka* as a marker entirely separate from nominal and property concept *ka*.

4.4 Conclusion

In this chapter, I laid out the motivation for further study of property concept words in Ulwa in the context of the Monotonicity Hypothesis. Briefly, in Ulwa, property concept words are morphologically complex, with the description of Ulwa verb classes in Chapter 5 leading to the conclusion that property concept words are derived from COS-denoting roots in this language, in violation of the Monotonicity Hypothesis. This chapter set the stage for further investigation of these facts in the chapters that follow by placing my study of the language in the context of previous study of the language and by laying out certain salient facts of the grammar of the language. This discussion is not only a prerequisite for understanding the discussion of the verb class system and the *–ka* suffix in the context of the MH in Chapters 5 and 6 but also serves to further the documentation and understanding of these particular aspects of this understudied and endangered Misumalpan language.

Chapter 5

Ulwa verb classes

5.1 Introduction

In Chapter 3, I embarked on examination of the prediction of the MH that words naming property concept states are never derived from words naming changes into those states.[1] This prediction was shown to hold for a wide variety of languages, and indeed, counterexamples to it seem extremely difficult to find. Preliminary discussion of data from Ulwa, however, raised questions as to the relationship of words naming property concept states to words naming states in that language.

Building on previous work on Ulwa verb class morphology by Hale and colleagues (Hale and Salamanca 2002; Hale and Keyser 2002), the investigation undertaken in this chapter shows that the relationship between words naming property concept states and changes of state appears to be as in (1).

[1] Koontz-Garboden (2006e) is a slightly revised version of this chapter.

(1) Ulwa (my fieldnotes; Green 1999; Hale and Salamanca 2002; Koontz-Garboden 2006c, 2006d)

	property concept	non-causative COS	causative COS	
a.	sang-ka	sang-da–	sang–	‘green/blue’
b.	yûh-ka	yûh-da–	yûh–	‘long, tall’
c.	baras-ka	baras-da–	baras–	‘black’
d.	bara-ka	bara-da–	bara–	‘dark’
e.	sik-ka	sik-wa–	sik–	‘large’
f.	warin-ka	warin-da–	warin–	‘bent’

That is, the functions of the Ulwa verb class morphology are shown in this chapter to be such that there is good reason to believe that roots in Ulwa are COS-denoting, with words naming property concept states derived from these by a derivation marked by the *–ka* suffix, in direct violation of the MH. Ultimately, I show that this *–ka* suffix does not alter the lexical semantic representation of the roots to which it suffixes, and that the Ulwa facts do not violate the MH. This can only be shown, however, once a thorough understanding of the Ulwa verb class system is achieved. This is the focus of this chapter.

I begin by reviewing the basics of the Ulwa verb class system laid out in previous work by Ken Hale and colleagues. Drawing on recently collected data from my own fieldwork, I then go on to develop an alternative analysis of the Ulwa verb class system, which, although better supported by the facts, actually makes Ulwa look even more typologically marked from the perspective of the MH than it originally did on Hale’s analysis. This leads to a detailed investigation of Ulwa property concept words in Chapter 6.

5.2 Overview of Ulwa verb classes

Verb class morphology is perhaps the best studied area of Ulwa grammar (Green 1999; Hale and Salamanca 2002; Hale and Keyser 2002; Juarros 2003; Koontz-Garboden 2006c,2006e) owing to the belief that the morphological verb classes have a non-trivial correlation with transitivity. The Ulwa verb class system, however, is by no means well-understood or even well described. In a series of papers in the 1990s culminating in the book with Samuel Keyser (Hale and Keyser 2002), Ken Hale worked toward developing a theory of verbal argument structure drawing on evidence from a wide range of languages. Among these languages was Ulwa, which by way of the discussion in Hale's work received the best description of its verbal morphology anywhere in the small literature on the language. In this section, I lay out the facts of the language as Hale saw them, following this by a brief description of the analysis he gave to these facts. In the sections following this, I draw on recently collected data which show that Hale's understanding of the Ulwa verb class system, while an excellent starting point, was incomplete in ways that have serious repercussions for any analysis of the Ulwa verb class system, including Hale's.

Ulwa verbs are divided into four major morphological classes, with the classes named according to the suffix that appears following the verbal root: *–da–, –pa–, –wa–,* and *–ta–*. Verbs in each of these classes are illustrated in (2).

(2) a. As-ki-na ya andih birh-**d**-ida.
shirt-<1SING> DEF already tear-DA-3SING.PAST
'My shirt has already torn.'

b. Arak-ki-bus bah-**w**-ida.
gun-<1SING> break-WA-3SING.PAST
'My gun broke.'

c. Alas yâ wis-**p**-ida.
3SING 1SING whip-PA-3SING.PAST
'S/he hit me.' (dict)

d. Kuh-ki ya kum-da-sa bahangh pûh-**t**-uting.
fire-1SING DEF burn-DA-NEG SO blow-TA-1SING.FUT
'Since my fire is not burning, I'm going to blow on it.' (dict)

The allure of the Ulwa verb class morphology to Hale was its role in the system of transitivity alternations in the language. As discussed by Hale and Salamanca (2002), verb roots in Ulwa often participate in transitivity alternations, having an intransitive variant in the *–da/wa–* classes and a transitive variant in the *–ta/pa–* classes, as illustrated by the data in (3) and (4).[2]

(3) a. As-ki-na ya andih birh-**d**-ida.
shirt-<1SING> DEF already tear-DA-3SING.PAST
'My shirt has already torn.'

b. Asna ya birh-**p**-i y-â-t-ah.
cloth DEF tear-PA-SS 1SING.NON-NOM-give-TA-2SING.IMPER
'Tear the cloth and give it to me.'

(4) a. Arak-ki-bus bah-**w**-ida.
gun-<1SING> break-WA-3SING.PAST
'My gun broke.'

b. Wahai-ki arak-ki-bus bah-**t**-ida.
brother-1SING gun-<1SING> break-TA-3SING.PAST
'My brother broke my gun.'

Although *–da–* alternates with *–pa–* in (3), and *–wa–* with *–ta–* in (4), as demonstrated by Hale and Salamanca (2002:43ff), for these four classes, all possible patterns of alternation exist. There are *–da–* intransitives with transitive *–ta–* counterparts and other *–da–* intransitives with transitive *–pa–* counterparts. Similarly, some *–wa–* verbs have transitive *–ta–* counterparts while other *–wa–* verbs have transitive *–pa–* counterparts. These combinations are illustrated by the data in (5)–(8).

(5) *–da–* intransitive with *–pa–* transitive (Hale and Salamanca 2002:41)

a. Kuring abuk-**d**-ida.
canoe capsize-DA-3SING.PAST
'The canoe capsized.'

[2] I have reglossed the examples from Hale and Salamanca (2002) to be consistent with my own glossing conventions.

b. Kuring abuk-**pa**-h!
canoe capsize-PA-2SING.IMPER
'Turn the canoe over!'

(6) *–da–* intransitive with *–ta–* transitive (Hale and Salamanca 2002:45)

a. Yang bikiska balna kaupak nû-**da**-ring.
1SING child PL from hide-DA-1SING.IRR
'I will hide (myself) from the children.'

b. Yang lih-ki-wan man kaupak nû-**ta**-ring.
1SING money-<1SING> 2SING from hide-TA-1SING.IRR
'I will hide my money from you.'

(7) *–wa–* intransitive with *–pa–* transitive

a. Balauh ya Kim yam-ka yam-ta-sa dai bahangh yam-ka
table DEF Kim good-ADJ make-TA-3SING.NEG PAST SO good-ADJ
sak-**wa**-sa.
stand-WA-3SING.NEG
'Because Kim did not construct the table well, it does not stand well.' (notes, 1020)

b. Yaka pan-ka ya yam-ka daya-p-i sak-**pa**-h.
that stick-3SING good-ADJ lean-PA-SS stand-PA-2SING.IMPER
'Stand that stick up at a good angle.' (dict)

(8) *–wa–* intransitive with *–ta–* transitive (Hale and Salamanca 2002:46)

a. Baka-ki itukwâna ala-**w**-ida.
child-1SING large grow-WA-3SING.PAST
'My child has grown large.'

b. Alas baka-ka yamk-ka ala-**t**-ang.
s/he child-3SING good-ADJ grow-TA-3SING.PRFCT
'She raised her child well.'

As implied by Hale and Salamanca (2002), an analysis of the Ulwa verb class system must account not only for alternating verbs, but also for the fact that some verbs fail to alternate. Indeed, as noted by Hale and Salamanca (2002:47) there are plenty of intransitive verbs in the *–da–* class that fail to have a transitive counterpart in the *–ta/pa–* classes.

(9) a. Ai-**d**-ikda.
cry-DA-1SING.PAST
'I cried.'
b. *Baka ya ai-**t**-ikda.
child the cry-TA-1SING.PAST
'*I cried the child.' (Hale and Salamanca 2002:48)

(10) a. Is-**da**-dai.
play-DA-3PL.PRES
'They are playing.'
b. *Sumaltingka ya bikiska balna is-**ta**-i.
teacher DEF child PL play-TA-3SING.PRES
'*The teacher is playing the children.' (Hale and Salamanca 2002:48)

Thus, the idea is that while many intransitive *–da–* verbs alternate, not all do.[3] Indeed, as Hale and Salamanca (2002) note, those with meanings akin to those of Perlmutter's (1978) "unergatives" tend to be those that do not alternate, e.g., verbs of "… sound production, bodily responses, and manner of motion" (Hale and Salamanca 2002:48).

Although more study remains to be done on the nature of these different types of alternations, the fact that the causative-inchoative alternation is accomplished with all these combinations and that there are non-alternating intransitives in the *–da–* class (if not also *–wa–*, a question Hale does not address) leads Hale and Salamanca to conclude that the major distinction to be made in the Ulwa verb class system is between *–da/wa–* and *–ta/pa–*, the former classes being intransitive and the latter tending to be transitive. This descriptive observation, which will be revised below on the basis of recent data, is

[3]In none of his articles does Hale discuss whether there are non-alternating *–wa–* verbs. So far as I have been able to tell, there are some (e.g., *nakawanaka* 'wound oneself'), though few. Why this should be merits investigation.

summarized by the table in (11).

(11) Hale and colleagues' understanding of transitivity and verbal morphological class in Ulwa

	intransitive	transitive
–da–	yes	no
–wa–	yes	no
–pa–	no	yes
–ta–	no	yes

The core descriptive idea running through Hale and colleagues' analyses of Ulwa is that *–da–* and *–wa–* spellout verbalizing functional heads, making intransitive verbs out of nominal and adjectival roots (whether the root projects a specifier or not), while *–pa–* and *–ta–* head transitivizing functional heads that transitivize the intransitive output of verbalization by *–da–* and *–wa–*.[4] Among the more central empirical claims of their analysis, then, is that *–ta/pa–* verbs are transitive, while *–da/wa–* verbs are intransitive, as predicted by their analysis of *–da/wa–* as verbalizers that have no impact on valence and *–ta/pa–* as transitivizers, making transitive an already intransitive construction. This analysis of the verbal morphology of Ulwa is summarized in (12).

(12) Hale and colleagues' analysis of Ulwa verb morphology

–da/wa–	verbalizers
–ta/pa–	transitivizers

Further research, on which I report below, suggests that while Hale and colleagues' prediction that *–da/wa–* verbs are intransitive is indeed correct, it is not the case that *–ta/pa–* verbs are always transitive, a finding which argues against its analysis as a marker of transitivity.[5] This finding, among others highlighted below, calls into question their

[4]Hale and colleagues don't ever make clear exactly how it is, on their analysis, that transitive *–pa–* and *–ta–* verbs don't include the *–da–* and *–wa–* morphology, since the input to transitivization is the output of verbalization, effected by *–da–* and *–wa–*. In fact, Juarros (2003) takes this as one of the main shortcomings of their analysis of Ulwa, namely, that it predicts cumulative morphology for causative *–ta/pa–* class verbs where there is none.

[5]Indeed, Hale and Salamanca (2002:49) seemed to recognize that there exist intransitive *–ta/pa–* verbs, highlighting this as an area in need of further study.

analysis of the *–ta–* and *–pa–* verb class markers as transitivizers of an intransitive stem. Likewise, although I believe that Hale and colleagues' prediction that *–da/wa–* verbs are always intransitive is indeed correct, I believe that their analysis of these suffixes simply as verbalizers of roots is incomplete. The evidence suggests that they do more than this, acting as markers of what Kemmer (1993), following many others, has called the *middle voice*. This proposed revised analysis, to be argued for in the remainder of this chapter, is highlighted in (13).

(13) Revised analysis of Ulwa verb morphology

–da/wa–	verbalizers that are also markers of the middle voice
–ta/pa–	verbalizers

The idea for *–ta/pa–*, like Hale and colleagues' analysis of *–da/wa–*, is simply that they verbalize a non-verbal, possibly precategorial root, altering in no way its lexical semantics. The lexical semantics of roots surface unaffected when suffixed by *–ta/pa–*. In contrast, *–da/wa–* actually effect changes in the lexical semantics of roots to which they suffix, as markers of the middle voice. My goal is not to give a comprehensive analysis of the middle voice, a task that goes far beyond the scope of this dissertation, but simply to make as clear as possible from a descriptive perspective what the middle voice is, in order to show that this is what *–da/wa–* mark. As I will show, one of the typical functions of the middle voice is anticausativization, both generally and in Ulwa in particular, a phenemonon that poses challenges to the MH. I defer discussion of this phenomenon to Chapter 8, focusing in this chapter on simply laying out the facts of Ulwa relevant for evaluation of the derived status of words naming property concept states in Chapter 6.

In the following sections, then, I first present the arguments for treating *–da/wa–* as markers of the middle voice. I then present arguments for treating *–ta/pa–* not as transitivizers, but instead as verbalizers, whose suffixation does nothing to alter the meaning of the root. This is followed by morphological evidence supporting this new analysis of the Ulwa verb class markers. Finally, I bring these facts back into the context of the larger theoretical issue, the MH, showing how the facts of Ulwa states and changes of state pose significant challenges to the hypothesis.

5.3 The middle voice and *–da/wa–*

In this section I detail evidence showing that *–da/wa–* have the distribution of what have been called markers of the middle voice (Haspelmath 1990; Klaiman 1991; Kemmer 1993; Thompson 1996). Many languages tend to have a morphological marker that appears in language after language in the same kind of linguistic context. What I show in this section is that the Ulwa *–da/wa–* markers appear in many of these contexts. I take this as an argument that whatever the right analysis of middle voice morphology is crosslinguistically, the Ulwa *–da/wa–* markers should be treated in this way. Thus, my goal is not to offer an analysis of middle morphology, but simply to show that whatever it is, *–da/wa–* fall under the same heading.

5.3.1 Event types

Kemmer (1993:21) observes that there is a cluster of event types that are frequently marked with middle morphology as intransitives and unmarked as transitives. Specifically, her crosslinguistic survey reveals that "[c]lasses in which the M[iddle] M[arked] verbs often … coexist alongside transitive unmarked forms are the body care, nontranslational motion, change in body posture, indirect middle, naturally reciprocal event, spontaneous event, and emotion middle types" (Kemmer 1993:21). In Ulwa, there is a large number of alternating verbs in the *–da/wa–* classes that alternate, principally naming events of what Kemmer would call "spontaneous actions or processes", which are generally various kinds of changes of state and position. Additionally, there is also a relatively large class of alternating *–da/wa–* verbs naming events of "change in body posture". These two broad classes of events are among the kinds of events that Kemmer observes tend to have middle marking as intransitives and are unmarked as transitives, providing a piece of evidence that *–da/wa–* have, at least in part, the distribution of Kemmer's middle voice markers. Lists of alternating verbs, along with whether or not they have a transitive alternate in *–ta/pa–*, which I claim below to be the morphologically unmarked form, are given in (14)–(16).[6]

[6]For cases where I do not know if there is a transitive alternate or not, I list ?? under the transitive column of the tables.

(14) COS verbs in the *–da–* class

verb	**gloss**	**class of trans. alternate**
abaldanaka	go bad	–ta–
abukdanaka	capsize	–pa–
alhdanaka	burst	–pa–
baradanaka	become dark	–pa–
barasdanaka	become black	–pa–
birhdanaka	tear, rip, shred	–pa–
birikdanaka	cover oneself	–pa–
bukdanaka	chip, crack	–pa–
dakdanaka	snap, sever completely	–ta–
didiudanaka	stretch/become stretched	–pa–
dulukdanaka	get soaked	–pa–
kalhdanaka	crush, break	??
karadanaka	melt/dissolve	–pa–
karhdanaka	become stuck	–pa–
kingdanaka	become clogged	–pa–
kubitdanaka	bend at joint	–pa–
kumdanaka	catch fire	??
kurudanaka	become unstitched	–pa–
lisdanaka	split/cleave	–pa–
luhusdanaka	foam/froth	–pa–
muhdanaka	wake up	–ta–
patdanaka	burst, rupture, pop	–ta–
pildanaka	chip/flake	–ta–
pitukdanaka	turn inside out	–ta–
puidanaka	cool/become lukewarm	–ta–
puradanaka	become wet	–ta–
pusingdanaka	swell	–ta–
raidanaka	become slicked with oily sheen on surface	–pa–
raudanaka	stand up/get up (from bed)	–ta–

rîdanaka	open (sail)	–pa–
rubukdanaka	become shorter	–pa–
sangdanaka	turn green	–pa–
sayakdanaka	become dislocated	–pa–
siritdanaka	become wrinkled	??
suihdanaka	break; snap off	–pa–
takdanaka	chip, flake off, peel	–pa–
tarakdanaka	tangle	–pa–
turudanaka	flake (skin)	–pa–
ulangdanaka	be or become mucky	??
uluhdanaka	loosen	–pa–
urundanaka	curl up in fetal position	??
warindanaka	become crooked	–pa–
wiridanaka	become twisted	–pa–
wiringdanaka	inflate, become inflated	–pa–
yamdanaka	become	–ta–
yûhdanaka	lengthen/become long	–pa–
yurahdanaka	open (mouth)	–pa–

(15) COS verbs in the *–wa–* class

verb	**gloss**	**class of trans. alternate**
alawanaka	to grow	–ta–
ituwanaka	grow in size	–pa–
mahwanaka	fill (stomach)	–ta–
nakawanaka	wound self (accidentally)	no alternate
purawanaka	become wet (on purpose)	–ta–
sikwanaka	become larger	??
singwanaka	heal/awaken	–pa–
bahwanaka	break (become non-functional)	–ta–
dakwanaka	rip, tear, break	–ta–
dâwanaka	burn	–ta–

diswanaka	go out, stall	–ta–
îwanaka	die, be sick	–ta–
lahwanaka	boil, cook	–ta–
sahwanaka	split, crack open, burst	–ta–

(16) Change of body posture verbs (all *–wa–*)

verb	**gloss**	**class of trans. alternate**
sakwanaka	stand up	–pa–
lauwanaka	sit down	–pa–
kutwanaka	lie down	–pa–
witwanaka	hang	–pa–
etc.		

The simple point of this section is that it is often the case crosslinguistically that there are intransitive/transitive verb pairs where the intransitive variant is morphologically marked and the transitive variant is not. Kemmer observes that this is particularly true for particular kinds of events, a fact she takes as evidence for the middle voice as a crosslinguistically real category, however it is analyzed. Ulwa *–da/wa–* have similar distribution, showing up on the intransitive variants of many verbs naming COS events, a fact I take as an argument for *–da/wa–* being markers of the middle voice.

5.3.2 Deponents

Kemmer (1993:22) notes that although they are rarely treated in formal analyses of middle marking, it seems to be universal that all languages with middle morphology have deponent middle intransitives, morphologically marked intransitive verbs that fail to have a non-middle, transitive counterpart. Well-described languages, she notes, sometimes have as many as a hundred or more such verbs, as she notes is the case for Latin according to Flobert (1975). Further, it is not the case that deponent middles fall into just any semantic class. Instead, Kemmer observes not only that all middle-marking languages have deponents, but that these deponents tend to fall into the same lexical semantic classes in language after language. These classes are listed in (17).

(17) Classes into which deponent middles fall (Kemmer 1993:16ff., 268)
grooming or body care (e.g., wash, get dressed, shave)
nontranslational motion (e.g., stretch one's body, turn, bow)
change in body posture (e.g., sit down, kneel down, lie down)
indirect (e.g., acquire, ask/request, take for oneself)
naturally reciprocal events (e.g., meet, embrace, wrestle)
translational motion (e.g., climb up, go/leave, walk/stroll, fly)
emotion (e.g., be angry, grieve/mourn)
emotive speech action (e.g., complain, lament)
other speech actions (e.g., confess, admit guilt, be boastful)
cognition middle (e.g., be cogitating, ponder, believe)
spontaneous events (e.g., grow, germinate/sprout, come to a stop, become)

As Hale and Salamanca (2002) observe for Ulwa, there are a number of non-alternating *–da–* verbs. Many of these, it turns out, fall into classes where it is not surprising, given Kemmer's crosslinguistic findings, to find deponent middles, i.e. classes like those in (17). Hale and Salamanca's non-alternating *–da–* verbs, divided into groups based on broad classification of event type, are given in (18)–(21).

(18) Speech actions
ahdanaka 'moan'; aidanaka 'cry'; baladanaka 'rumble, make vibrating sound'; bisakdanaka 'make smacking sound'; biisdanaka 'make a click or kissing sound'; tikahdanaka 'pontificate'; wapdanaka 'growl'

(19) Body actions
aamhdanaka 'yawn'; aaudanaka 'belch'; baarhdanaka 'snore'; bilamhdanaka 'blink eyes'; buihdanaka 'twitch, have muscle spasm'; isamhdanaka 'sneeze'; nanadanaka 'tremble'; uhdanaka 'cough'; yuputdanaka 'twitch, stir'

(20) Translational motion
isdanaka 'play'; pisitdanaka 'somersault, roll end over end'; pitukdanaka 'kick, flail, also turn inside out, also do somersaults, carwheels, backflips'; rikdanaka 'crawl [as of baby]'; sutdanaka 'jump'; tumhdanaka 'swim'; umitdanaka 'dive';

wamhdanaka 'travel'; waatdanaka 'walk'; yaradanaka 'stagger, togger, reel'

(21) Cognition/emotion
amatdanaka 'grieve, be sad'; audanaka 'be happy'; sayadanaka 'be lazy'; audanaka 'be happy'

The observations, then, are two. First, as middle markers generally do crosslinguistically, *–da/wa–* appear on certain verbs lacking unmarked counterparts. Secondly, the classes of events in which these deponent middle marked verbs fall are ones that are generally known crosslinguistically to favor deponent middle marking. These observations constitute another argument for the treatment of *–da/wa–* as middles.

5.3.3 Impersonal uses

An additional distributional similarity between markers of the middle voice, according to Kemmer (1993:178, 268), and *–da/wa–* concerns impersonal uses. Kemmer (1993:178, 268) observes that it is often the case that middle marked verbs have impersonal uses. It appears that this is true of *–da/wa–* in Ulwa. I take this matter up in §5.6.

5.3.4 Functions of *–da/wa–* qua middle voice markers

I conclude that in more ways than one *–da/wa–* have the distribution of middle voice markers—in the kinds of events named by verbs on which they appear, in that there are impersonal uses of verbs relying on this morphological device, as is seen in §5.6, and in the fact that they appear on certain kinds of intransitive verbs without unmarked transitive counterparts. The latter of these functions, often called an anticausativizing function, is among the more prominent. I postpone detailed analysis of anticausativization until Chapter 8. The important observation in the present context is merely that anticausativization, in general and as marked by *–da/wa–* in particular, is an operation that alters the lexical semantic structure of lexemes to which it is applied, taking a causative COS denoting lexeme as an input and returning a non-causative COS denoting lexeme as output. Thus, it has a particular lexical semantic context in which it can operate—applying only to particular kinds of meanings, loosely speaking (see Chapter 8 for more detail) causative ones to yield non-causative ones. In their guise as an anticausative, then, *–da/wa–* fundamentally alter the meaning of lexemes to which they are suffixed. As is shown in the sections that follow, in this way they differ markedly from *–ta/pa–* which do nothing to alter the lexical semantics of roots to which they suffix. Instead, their sole function is to derive a verbal stem from a bare root, leaving the lexical semantics of the root unaffected.

5.4 The *–ta/pa–* suffixes as verbalizers

In the sections that follow, I lay out the evidence that shows that contrary to claims made by Hale and colleagues, *–ta/pa–* do not effect any changes in the lexical semantics of roots. Instead, they simply turn a root into a verbal stem, allowing the root's meaning to surface unaltered. The arguments for this come from patterns of verbal alternations, morphosyntactic encoding of the arguments of these verbs, and from the kinds of events encoded by verbs in these classes.

5.4.1 Non-alternating *–ta/pa–* verbs

Although it is briefly acknowledged by Hale and Salamanca (2002:49) that there are non-alternating verbs in the *–ta/pa–* classes, this is not predicted by their analysis of *–ta/pa–* as transitivizers of intransitive verbs. Instead, as discussed above, their analysis predicts all *–ta/pa–* verbs to be transitive.

Among the most important empirical observations for the study of transitivity and Ulwa verb classes to emerge from recent work is the finding that, contrary to expectation on the Hale and Keyser analysis, there is a host of intransitive verbs in the *–ta/pa–* classes, a finding which argues against the Hale and Keyser treatment of *–ta–* and *–pa–* as transitivizers. Further, in addition to having intransitive uses, many of these, such as those in (22)–(24), fail to have transitive alternates.

(22) *batanaka* 'become a young man'

a. Baka-ki al ya andih bata-p-ai bahangh tukka tî-ka
child-1SING male DEF already man-PA-3SING.PRES SO work heavy-ADJ
balna yam-t-i yâ-t-ai.
PL do-TA-SS 1SING-give-3SING.PRES
'Since my son is fast becoming a man he does the heavy work for me.' (Green dict.)

b. *Yang (raupi) baka-ki al ya bata-p-uting.
1SING (SUBJ) child-1SING male DEF man-PA-1SING.FUT
'I will raise my son into a man.' (intended; notes, 474)

(23) *pânaka* 'grow'

a. Anu ya lau-t-ikda kau yam-ka pâ-t-ida.
coconut DEF plant-TA-1SING.PAST when good-ADJ grow-TA-3SING.PAST
'When I planted the coconut tree, it grew well.' (notes, 942)

b. *Anu pâ-t-ikda ya andih î-w-ida.
coconut grow-TA-1SING.PAST DEF already die-WA-3SING.PAST
'The coconut tree that I raised has already died.' (intended)

(24) *tipitnaka* 'congeal'

a. Turuh auh-ka balna tipit-t-ai.
cow fat-3SING PL congeal-TA-3SING
'The fat of the cow congeals.' (notes, 969)

b. *Turuh auh-ka ya tipit-t-uting.
cow fat-3SING DEF congeal-TA-3SING.FUT
'I'm going to congeal the fat of the cow.' (notes, 969)

There are other intransitive *–ta/pa–* verbs that do alternate, as illustrated by the data in (25) and (26).

(25) *puruhnaka* ‘sink, deepen’

a. Bâwas, tining karak yak wat-ya kau, mâ bû datak
diarreah vomit with 1PL.INCL catch-3SING.PRES when day two after
mikdi-ni ya andih puruh-t-ai.
eye-1PL.INCL DEF already deep-TA-3SING.PRES
‘After two days of diarrhea and vomiting our eyes are already sunken.’ (dict.)

b. Yang nuh-ki ya kanas puruh-ta-yang, pihmak ya kanas isau
1SING mortar-1SING DEF more deep-TA-1SING.PRES rice DEF more much
wat-rang yulka.
fit-3SING.IRR because
‘I’m deepening my mortar so it will hold more rice.’ (dict.)

(26) *auhnaka* ‘become fat’

a. Kasnaka dîka mah-ka kas-ring laih auh-ta-ring.
food thing-3SING much-ADJ eat-3SING.IRR if fat-TA-1SING.IRR
‘If I eat a lot I will become fat.’ (dict.)

b. Sû-ki-lu auh-t-ikda.
dog-<1SING> fat-TA-1SING.PAST
‘I fattened my dog up.’ (notes, 968)

Alternating verbs like the ones illustrated in (25) and (26) are different from other alternating pairs, like those in (3)–(4) and repeated in (27)–(28), in that there is no change in verb class associated with the change in valence.

(27) a. As-ki-na ya andih birh-d-ida.
shirt-<1SING> DEF already tear-DA-3SING.PAST
‘My shirt has already torn.’

b. Asna ya birh-p-i yâ-t-ah.
cloth DEF tear-PA-SS 1SING.NON-NOM-TA-2SING.IMPER
‘Tear the cloth and give it to me.’

(28) a. Arak-ki-bus bah-w-ida.
gun-<1SING> break-WA-3SING.PAST
'My gun broke.'

b. Wahai-ki arak-ki-bus bah-t-ida.
brother-1SING gun-<1SING> break-TA-3SING.PAST
'My brother broke my gun.'

Additional examples of *–ta/pa–* intransitives, some of which alternate and some of which do not, are given in (29)–(30).[7]

(29) Intransitive COS verbs in the *–ta–* class
auhnaka 'become fat'; buhnaka 'become dry (e.g. clothes)'; dutnaka 'spoil/rot'; lalahnaka 'ripen, rot'; lapusnaka 'be/become baggy/sag'; pakapnaka 'stiffen, become rigid'; pânaka 'grow'; paunaka 'turn red'; pînaka 'become blind, dry up (eyes)'; pulunaka 'flower, blossom'; pupuhnaka 'swell'; puruhnaka 'become sunken (cheeks, eyes)'; putnaka 'billow (smoke)'; ripnaka 'cool off'; bangnaka 'become full'; damnaka 'sweeten'; sapaknaka 'sour, ferment, spoil'; siunaka 'be fully developed, but not ripe'; tapalhnaka 'spoil, become bitter'; tipitnaka 'congeal, coagulate, harden'; tubaknaka 'become thick/overgrown (e.g. trees)'; wirunaka 'shrivel, dry out (green, unripe fruit)'; nanaknaka 'curdle'; pulingnaka 'blister'

(30) Intransitive COS verbs in the *–pa–* class
ingnaka 'become light/light up'; baknaka 'rot, perish, get/be drunk'; wanihnaka 'become pregnant again'; babarnaka 'become thin'; amatnaka 'swell (river)'; batanaka 'become a man'; rukuhnaka 'become bumpy/break out in hives'; tutuhnaka 'become bumpy/break out in hives'; lusuhnaka 'become flaky'; lamnaka 'calm (e.g. body of water)'; lamatnaka 'swell (water)'; dalaunaka 'become gooey'; rainaka 'form slick on water'; aisaunaka 'disappear'; buhutnaka 'become cloudy'; barahnaka 'burn partially/incompletely'; minisihnaka 'become

[7] Some of the verbs listed in (29) and (30) also have transitive uses. I have not yet been able to systematically check one by one which of the verbs have such uses.

dirty'; tînaka 'become rusty/get out of practice'; disnaka 'become silent, quiet down'; dasinaka 'become strong'; wasaknaka 'become tangled, become embroiled in a fight'; lilisnaka 'become tattered, ragged'; witnaka 'become used up'; tatasnaka 'get dirty'; ahaunaka 'loosen, become loose'; raunaka 'ripen, but not fully, just before softening'; bisinaka 'shrink by losing some'

The fact that so many *-ta/pa–* verbs are intransitive argues strongly against the analysis of *–ta/pa–* as transitivizers. Equally important is, however, that in addition to alternating transitive *–ta/pa–* verbs and non-alternating intransitive *–ta/pa–* verbs, there are also non-alternating transitive *–ta/pa–* verbs, i.e., transitive verbs in the *–ta/pa–* classes that fail to have an intransitive *–da/wa–* alternate. Some examples are given in (31).[8]

(31) Non-alternating transitive *–ta/pa–* verbs (baunaka,)

a. Kim raudi yal as kau mâdi **bau-t-ida**.
Kim RAUPI woman one at now hit-TA-3SING.PAST
'Kim just now hit a woman.' (notes, 1024)

b. Al ya yâ-ka-mak **tus-p-ai**.
man the farm-<3SING> clear-PA-3PRES.SING
'The man is clearing his farmland.' (dict)

c. Was isau lau-t-ida bahangh wassik ya **amat-p-ida**.
water much fall-TA-3SING.PAST so river DEF swell-PA-3SING.PAST
'Because it rained a lot, the river swelled.' (notes, 989)

d. Damai pukka yang **bak-p-ing** dai.
yesterday night 1SING get.drunk-PA-1SING.PRFCT PAST.AUX
'Last night I got drunk.' (notes, 1054)

e. Al baka-na ya bisi-ka kaupak mâmaka 15 balna kau andih **bata-p-ai**.
male small-PL DEF small-ADJ from year 15 PL to already become.young.man-PA-3SING.PRES

[8] The examples given in (31) are with verbs for which I have a relatively high degree of certainty that transitive uses of the *–ta/pa–* verb are unacceptable.

'Little boys, from a young age by the time they reach 15 years old they've already grown into little men.' (notes, 474)

f. Al-ki-muk kasnaka yak-t-ing dai katka alas
man-<1SING> food take.out-TA-1SING.PRFCT PAST.AUX but 3SING
wal-ta-sa atya kat muih-ka ya andih auh-ka-ka
want-TA-3SING.NEG QUOTE ? meat-3SING DEF already fat-3SING-ADJ
tipit-t-ida bahangh.
congeal-TA-3SING.PAST because
'I took out some food for my husband, but he said he didn't want it because the grease of the meat had already congealed.' (dict)

The patterns of transitivity found among the *–ta/pa–* verbs, then, are quite varied. These are summarized in (32).

(32) a. alternating *–ta/pa–* with intransitive variant in *–da/wa–* (e.g., *bahnaka*, *bahwanaka* 'break')
b. alternating *–ta/pa–* with intransitive variant in *–ta/pa–* (e.g., *auhnaka* 'become fat')
c. non-alternating *–ta/pa–* intransitive (e.g., *pânaka* 'sprout')
d. non-alternating *–ta/pa–* transitive (e.g., *baunaka* 'hit')

The kind of heterogeneity summarized in (32) is not consistent with *–ta/pa–* having a uniform outcome on the argument structure of roots to which they suffix. Instead, I believe this heterogeneity suggests that the variation is located in the lexical entries of each individual root and that *–ta/pa–* suffixes merely serve to turn these bound roots into verbal stems to which verbal inflectional morphology can be suffixed.

5.4.2 Impersonal verbs

It turns out that the heterogeneity in *–ta/pa–* verbs goes even further than what was illustrated in the last section. In particular, it is not the case that the intransitive verbs in *–ta/pa–* are uniform in terms of how they treat their single argument morphosyntactically.

Ulwa has two distinct classes of intransitive verbs: (a) intransitive verbs whose single argument looks as though it is a subject, and (b) intransitive verbs whose single argument looks as though it is *not* a subject.[9] The existence of these two separate classes has not been previously recognized in investigations of Ulwa verb morphosyntax (Hale and Keyser 1998; Green 1999; Hale and Salamanca 2002; Hale and Keyser 2002; Juarros 2003) (though it has indeed been briefly recognized in the description of Mayangna verb classes given by Norwood 1997:46). As is shown in the discussion that follows, the facts that they (a) exist and (b) fall into the morphological verb classes they do offers further evidence for the view presented here that *–ta/pa–* perform no uniform semantic function on roots. First, however, I lay out the facts, beginning with a description of verbs whose single argument behaves as though it is a subject, following this with discussion of verbs whose single argument behaves as though it is not a subject. For both classes, I examine behavior of the verbs on three diagnostics that distinguish the two classes: (a) pronominal case, (b) subject/verb agreement, and (c) switch reference marking in verb-chaining constructions.

Verbs whose single argument behaves as a subject

The first group of intransitive verbs includes those in which the single argument is treated, according to the three diagnostics under examination, as a subject. The first of these diagnostics is case in the pronominal system. Although Ulwa does not overtly mark case on nominals, there is a nominative/non-nominative distinction in first and second person pronouns. This is laid out by the table in (33).

[9]These verbs in Ulwa seem to have a profile similar to what have been called in some Australian languages “impersonal verbs” (Walsh 1987; Evans 2004), a term I adopt here for the Ulwa verbs under investigation.

(33) Ulwa pronouns

	nominative	non-nominative
1sing	**yang**	**yâ**
2sing	**man**	**mâ**
3sing	alas	alas
1pl.excl	**yangna**	**yâna**
1pl.incl	**mining**	**yak**
2pl	**manna**	**mâna**
3pl	alas balna	alas balna

For intransitive verbs in the class where the single argument is subject-like, when they take a first or second person pronominal as their argument, the pronominal is nominative, as shown by the data in (34).

(34) a. Yang bât-p-ikda.
1SING.NOM fart-PA-1SING.PAST
'I (nom) farted.'

b. Yang ala-w-ikda.
1SING.NOM grow-WA-1SING.PAST
'I (nom) grew up.'

It is also the case that verbs in this class agree in person and number with their argument, as is expected of subjects on the basis of their behavior with transitive verbs. This is illustrated by the data in (35).

(35) a. Yang tuh-p-ikda.
1SING.NOM spit-PA-1SING.PAST
'I spit.' (notes, 1135)

b. Man bât-p-idam.
2SING.NOM fart-PA-2SING.PAST
'You farted.'

c. Man wauh-di-dam.
2SING.NOM fall-DA-2SING.PRES
'You fell.'

The final diagnostic I examine for subjecthood of the single argument of this class of intransitives comes from switch reference. As discussed briefly in Chapter 4, in Ulwa verbs can be chained together in coordinate-like (sometimes serial verb-like) constructions with the first verb being marked for whether or not it has the same subject as the following verb. When intransitive verbs in the class under discussion are chained together with a verb that shares the same logical subject, the first verb shows same-subject morphological marking, as expected, rather than different-subject morphological marking. This state of affairs, illustrated by the data in (36)-(38) is what is expected if the argument of the intransitive is indeed a subject.

(36) a. Alas balna asal-d-i luk-di-dida.
s/he PL embarrass-DA-SS hide-DA-3PL.PAST
'They became embarrassed and hid.'

b. *Alas balna asal-da-dak luk-di-dida.
s/he PL embarrass-DA-3PL.DS hide-DA-3PL.PAST
'They became embarrassed and hid.' (notes, 1122)

(37) a. Wahai-ki kal dak-ti naka-w-ida.
brother-1SING self cut-ss wound-WA-3SING.PAST
'My brother cut and wounded himself.'

b. *Wahai-ki kal dak-tak naka-w-ida.
brother-1SING self cut-3SING.DS wound-WA-3SING.PAST
'My brother cut and wounded himself.' (notes, 1071)

(38) a. Was ya lau-ti lâ-t-ida.
rain DEF fall-ss pass-TA-3SING.PAST
'The rain fell and passed.'

b. *Was ya lau-tak lâ-t-ida.
rain DEF fall-3SING.DS pass-TA-3SING.PAST

'The rain fell and passed.' (notes, 1079)

In sum, then, there is a class of intransitive verbs whose single argument seems to behave as a subject according to three diagnostics: subject/verb agreement, pronominal case, and switch reference. Some of the verbs in this class are given in (39).

(39) Some intransitive verbs whose single argument behaves as subject
bâtnaka 'fart'; baknaka (optionally impersonal) 'become drunk'; minisihnaka 'get dirty'; tuhnaka 'spit'; asaldanaka 'become embarrassed'; alawanaka 'grow up'; nakawanaka 'wound oneself'; patdanaka 'explode'; papdanaka 'open'; lâwanaka 'pass'; îranaka 'run'; nanadanaka 'shake'; ilwanaka 'go up'

A point that will be returned to later is that there seem to be intransitive verbs of this type represented in all four morphological verb classes in the language, *–ta/pa–* and *–da/wa–*. Further, so far as I can tell, all *–da–* class verbs seem to be members of this class. Whether this is true of all *–wa–* verbs or not is not clear to me at the moment, though it is certainly clear for some of them (see data above). For *–ta–* and *–pa–* class intransitives, however, although there are some for which the single argument is treated as a subject, it is not the case that all verbs in these classes that take only one argument treat their single argument in this way. Indeed, there are a number of intransitive verbs in these classes that treat their single argument quite differently, as is seen in the section that follows.

Impersonal intransitive verbs

According to the three diagnostics outlined in the previous section, there is a class of intransitive verbs that behaves quite differently from the one previously illustrated.

First, when predicated of a first or second person argument, with impersonal verbs case is non-nominative rather than nominative, contrasting with the case assignment for the single argument of verbs in the previous class.[10] This is illustrated by the data in (40)

[10]Norwood (1997:46) claims that in the sister language Mayangna, the single argument of verbs in this class is dative. I leave as an open question whether it is dative or accusative. All that matters for the purposes of the discussion is that there are two classes of intransitive that treat their single argument

and (41), the (a) examples being ones in which a pronoun in nominative case appears with an impersonal verb, which is unacceptable, the (b) examples being ones in which the non-nominative version is used with an impersonal verb, as required by the grammar of the language.

(40) a. *yang suh-p-ing
1SING.NOM tire-PA-1SING.PRFCT
'I am tired.'
b. yâ suh-p-ang
1SING.NON-NOM tire-PA-3SING.PRFCT
'I am tired.'
c. yâna suh-p-ang
1SING.NON-NOM tire-PA-3SING.PRFCT
'We (excl) are tired.'

(41) a. *yang nana-p-ikda
1SING.NOM tremble-PA-1SING.PAST
'I trembled'
b. yâ nana-p-ida
1SING.NON-NOM tremble-PA-3SING.PAST
'I trembled' (e.g. due to fear, not from cold, which is a different verb)

The data in (40) and (41), not only illustrate facts about case marking with impersonal verbs, but also illustrate a contrast in subject/verb agreement when compared to the facts of agreement with non-impersonal verbs, as discussed in the previous section. Whereas a non-impersonal verb agrees with its single argument in person and number, as shown in (35), this is not the case for impersonal verbs, such as those in (40) and (41), where it is shown that the verb does not agree with its argument in either person, as in (40b) and (41b), or number, as in (40c).

It turns out that due to the nature of their meanings many impersonal verbs do not

in significantly different ways, one as a subject, one not as a subject. The question of what exactly the latter's case is is a somewhat tangential question.

occur with first or second person arguments. For these kinds of verbs, although the consequences for case cannot be observed (due to the lack of nominative/non-nominative contrast in the third person cells of the pronominal paradigm, as seen in (33)), consequences for subject/verb agreement are still evident. In many instances verbs in this class do not even have the possibility of having plural agreement. In some cases, the expected third plural conjugation is claimed not even to exist. This is shown by the data in (42) and (43).

(42) a. Anu-ki pan-ka balna ya pâ-t-ai
coconut-1SING tree-3SING PL DEF grow-TA-3SING.PRES
'My coconut trees are growing.' (notes, 1067)
b. *pâ-dai
grow-3PL.PRES
(judged to be non-existent, notes, 1067)

(43) a. Mikdiki bûpak pî-t-ang.
eye.1SING both blind-TA-3SING.PRFCT
'Both of my eyes have become blind.' (nat. occurring, 6/4/2005)
b. ?Mikdiki bûpak pî-na.
eye.1SING both blind-3PL.PRFCT
'Both of my eyes have become blind.'

Finally, with the impersonal verbs, even though a verb chaining construction may conceptually seem to have the same underlying subject, different subject morphology tends to be used, as shown by the data in (44)–(45).

(44) a. Yâ suh-pak tung yang.
1SING.NON-NOM tire-3SING.DS walk 1SING.COP
'I'm walking around all exhausted.'
b. ?Suh-pi tung yang.
tire.SS walk 1SING.COP
'I'm walking around all tired.'

(45) a. Wahai-ki nana-pak wauh-d-ida.
brother-1SING tremble-3SING.DS fall-DA-3SING.PAST
'My brother trembled and fell.' (notes, 1077)
b. ?Wahai-ki nana-pi wauh-d-ida.
brother-1SING tremble-SS fall-DA-3SING.PAST
'My brother trembled and fell.' (notes, 1077)

The fact that different-subject marking is used on the first verb in the verb chaining construction in sentences with impersonal verbs such as the ones in (44)–(45), suggests that the two verbs do not share the same subject, despite the fact that the referent of this argument serves conceptually as the subject of each of these clauses. This makes sense if the single argument has a different grammatical status for the impersonal verb than it does for the non-impersonal verb.[11]

These "impersonal" (intransitive) verbs, then, differ from their non-impersonal counterparts on the basis of three diagnostics—pronominal case, subject/verb agreement, and behavior in verb-chaining constructions. A list of verbs for which at least one of these characteristic behaviors in the three constructions is observed is given in (46).

(46) Some intransitive verbs displaying some or all of the impersonal verb properties
bahamnaka 'be hungover'; dalanaka 'be in pain'; piinaka 'be(come) blind'; makauhnaka 'be(come) tired' raunaka (become ripe, fruit); minisihnaka 'become dirty' (optionally impersonal); lilisnaka 'become tattered' (optionally impersonal); buhnaka 'become dry'; dutnaka 'spoil'; baknaka 'spoil, drunk'

[11] The naturally occurring sentence in (i) is one in which two impersonal verbs appear together in a verb chaining construction.

(i) Yâ rip-tak yâ isi-p-ida.
1SING.NON-NOM cold-3SING.DS 1SING.NON-NOM shudder-PA-3SING.PAST
'I got cold and shuddered.' (notes, 1023)

That fact that the first intransitive verb appears with different-subject switch reference marking, despite the fact that the referent of its single (non-subject) argument is the same as that of the second verb suggests that switch reference marking is indeed sensitive to something like subjecthood in Ulwa—though the two verbs share the argument, for neither of them is it the subject, and therefore they do not share a subject.

> (optionally impersonal; as impersonal, dead); siunaka 'ripe, fruit' (optionally impersonal); lalahnaka 'become ripe'; paanaka 'grow'; suhnaka 'tire'; walahnaka 'sweat'; baradanaka (end the day); dasinaka 'be(come) strong'; bulusnaka 'become black (as result of cooking)'; sangnaka 'clear, (water)'; ripnaka 'be cold'; isinaka 'shake'; nananaka 'tremble'; pakapnaka 'become stiff'; kipnaka 'flow quickly (water)'; lulungnaka 'become weak' ...

In contrast to the situation that was observed with the non-impersonal intransitive verbs, which show up in all four morphological classes, the vast majority of impersonal verbs seem to be in the *–ta/pa–* classes. Indeed, I am unaware of any clearcut examples of impersonal verbs that are *not* in the *–pa–* or *–ta–* classes. This shows that there is even more heterogeneity in the argument structure of *–ta/pa–* verbs. There is nothing about *–ta/pa–* that makes it predictable how an intransitive verb treats its single argument. Instead, this seems to be a property of the root itself. The observation, then, is that *–ta/pa–* verbs are so heterogeneous in terms of their argument structure that there is no single operation that *–ta/pa–* could be performing that would yield this outcome. Instead, these differences in the argument structure of *–ta/pa–* verbs, I believe, simply follow from the lexical specification of the roots themselves. What *–ta/pa–* do, then, is simply to turn these roots into verbal stems, leaving their lexical semantics and argument structure unchanged.

5.5 Lexical semantic asymmetries

In the preceding sections I laid out a range of evidence that suggests that while *–ta/pa–* do nothing to the lexical semantics of the root to which they suffix, *–da/wa–* do. Particularly, in their guise as middle voice markers, when suffixing to roots with COS meaning, *–da/wa–* seem to perform an anticausative-type function, a common function of markers of the middle voice. In the sections that follow, I show that this fundamental difference in the nature of the verbal suffixes has consequences for the kinds of events that are encoded by verbs of the different classes. The observation is that the kinds of meanings denoted by *–da/wa–* verbs are generally predictable, based on the knowledge that a common function of middle voice markers, like *–da/wa–*, is anticausativization. In contrast, the meanings of verbs in the *–ta/pa–* classes are generally unpredictable—many different kinds of meanings are found among verbs with these markers, consistent with the idea that *–ta/pa–* do nothing to alter the lexical semantics of the root. The evidence comes from two sources—first, the polysemy of roots when used as *–ta/pa–* as opposed to *–da/wa–* verbs, and second from the kinds of COS events named by verbs of the different classes. Both sources of evidence lend further support to the descriptive claim that while *–ta/pa–* do not alter the meaning of roots they suffix to, *–da/wa–* do.

5.5.1 Polysemy in *–ta/pa–* versus *–da/wa–*

It is often the case that a given root can form a verb in both the *–ta/pa–* and the *–da/wa–* classes. In fact, this is how the causative-inchoative alternation is often marked, as already discussed, with the root having a causative COS meaning when suffixed by *–ta/pa–* (47a) and non-causative COS meaning when suffixed by *–da/wa–* (47b).

(47) a. Wahai-ki arak-ki-bus bah-t-ida.
brother-1SING gun-<1SING> break-TA-3SING.PAST
'My brother broke my gun.'
b. Arak-ki-bus bah-w-ida.
gun-<1SING> break-WA-3SING.PAST
'My gun broke.'

In pairs like the one in (47), the root has the same basic sense, whether suffixed by *–ta/pa–* or *–da/wa*—–in both cases, a breaking event is described, one causative, one non-causative. Additionally, however, it is often the case that the *–ta/pa–* class verb has additional senses unavailable to the *–da/wa–* verb. For example, for the root *bah–*, there are a number of additional senses associated with it when used as a *–ta–* class verb that are unknown in its use as a *–wa–* class verb, as illustrated by the data in (48).

(48) a. Yang man karak kal bah-t-uting.
1SING 2SING with RECIP break-TA-1SING.FUT

‘I’m going to race with you.’ (dict)

b. Am ya ya-w-i bah-t-uting.
corn DEF go-WA-SS break-TA-1SING.FUT
‘I’m going to harvest the corn.’ (notes, 985)

c. Asna balna yaka yam-ka bah-t-i kustal kau pû-naka.
cloth PL that good-ADJ break-TA-SS bag in put-3SING.INF
‘Fold the clothes well and put them in the bag.’ (dict)

The observation is that while the root *bah–* when suffixed with *–ta–* can describe a range of events, from breaking events to racing, folding, and harvesting events, when suffixed with *–wa–* it can only describe a breaking event. That is, the senses associated with the root *bah–* in (48) surface only when it is suffixed by *–ta–*, never when it is suffixed by *–wa–*.

It is not only additional transitive senses, like those in (48), that are found in the *–ta/pa–* classes to the exclusion of the *–da/wa–* classes. For some roots, the *–ta/pa–* verb has additional intransitive senses generally not found for the *–da/wa–* verb. This is illustrated for the root *sang–* in (49) and (50).

(49) a. Joe malai-ki dâ-p-ak sang-p-ida, bakan-t-i
Joe cassava-1SING let-PA-3SING.DS green-PA-3SING.PAST, sell-TA-SS
yak-ta-sa dai bahangh.
take-out-TA-3SING.NEG COP.PAST because
‘Joe let my cassava turn green as a result of failing to take it out and sell it.’ (notes, 964)

b. Mâ daih-ka wat-da bahangh î-w-ang dai. Katka
sun hot-ADJ grab-3SING.PAST so die-WA-3SING.PRFCT COP.PAST but
madi laih buna sang-p-ida kut ka.
now TOP again green-PA-3SING.PAST lie SENT.KA
‘The hot sun got to it, so it died (the grass). But now, it is now in a state of having come back alive.’ (notes, 994)

c. Wassik ya sang-p-ida bahangh kut-naka yam-ka kut ka.
river DEF green-PA-3SING.PAST SO fish-3SING.INF good-ADJ lie SENT.KA
'The river cleared up, so it's good to go fishing.' (notes, 988)

d. Û-ki ya kah-t-i sang-p-ikda.
house-1SING DEF paint-TA-SS green-PA-1SING.PAST
'I painted my house green.'

(50) Muh-ma yâka sang-d-i tung man.
face-2SING that green-DA-SS walk 2SING
'Your face is turning green.' (notes, 966)

While the *–pa–* suffixed root can have a range of metaphorically extended senses on the core sense of the root *sang–* 'green', as shown in (49), the *–da–* suffixed root in (50) has only a sense having to do with a change into the color of green. This is consistent with my analysis of *–ta/pa–* as doing nothing to alter the semantics of the root. The idea is that the root *sang–* has many senses available to it, all of which can surface when it is suffixed with *–pa–*, whose sole function is to turn the root into a verbal stem. In contrast, *–da–*, as a marker of the middle voice, does alter the sense of the root, and its condition for application is met only by certain kinds of meanings that a root might have. In its guise as anticausative, *–da–* (and *–wa–* like it) can operate only on causative COS senses of roots, taking a root with causative COS meaning and yielding a non-causative COS meaning. For senses that are not causative, as with many of the senses of the root *sang–* illustrated in (49), the condition of application of *–da/wa–* as anticausativizers is simply not met, and thus *–da/wa–* simply do not surface with those kinds of senses. This state of affairs is illustrated graphically in (51).

(51) The various senses associated with the root *sang–*

sangnaka (*–pa–* class)

sang– → ‘turn green (cassava)’
→ ‘become clean (body of water)’
→ ‘(cause to) become alive/well’

sangdanaka (*–da–* class)

→ ‘cause to become green’ ⟶ ‘become green’

The idea illustrated by (51) is that roots can have many senses, all of which can surface as *–ta/pa–* verbs, since all *–ta/pa–* do is to turn a root into a verbal stem, doing nothing to the lexical semantics of the root. In contrast, *–da/wa–* have a lexical semantic function in their use as anticausatives, and can only operate on roots with causative COS senses.

5.5.2 Change of state event types in the classes

As already mentioned at the outset, intransitive verbs are found in all four morphological classes. Among the things left undiscussed, however, was the fact that at least in the domain of COS verbs, there is an asymmetry in the kinds of COS events encoded by verbs in the different classes. More specifically, the kinds of COS events found in the *–pa/ta–* classes are a superset of the kinds found in the *–da/wa–* classes. Drawing on the external/internal causation distinction (Smith 1970; Haspelmath 1993; Levin and Rappaport Hovav 1995), I show that while there are both internally and externally caused verbs in the *–ta/pa–* classes, there are only externally caused verbs in the *–da/wa–* classes. Like the facts discussed in the previous section, this asymmetry points to a difference in the lexical semantic nature of the verb class markers. While *–ta/pa–* allow the meaning of a COS root to surface without doing anything to it, *–da/wa–* do not. Instead, *–da/wa–* perform an anticausative operation on roots with externally caused COS meaning. Exactly how this is accomplished formally is discussed in Chapter 8. Here, I simply lay out the facts that point to an asymmetry in the kinds of senses that surface with the two classes by way of offering further support for the descriptive claims about Ulwa verb class markers that have been the focus of this chapter.

I begin by laying out the distinction between internal and external causation. This is followed by discussion and argumentation showing that there are both internally and externally caused COS verbs in *–ta/pa–*, while there are only externally caused verbs in *–da/wa–*.

Internal versus external causation

Drawing on earlier work by Smith (1970) and Haspelmath (1993), Levin and Rappaport Hovav (1995:Chapter 3) propose a broad contrast between two types of eventualities that are lexicalized by verbs, those which are *internally caused* and those which are *externally caused*, the idea being that events contrast in the degree to which the participant in the caused event is viewed as also being the causer (causation "internal" to the participant in the caused event) or not (causation "external" to the participant in the caused event). In the words of Levin and Rappaport Hovav, with internally caused verbs (i.e., verbs denoting an event that is internally caused) "… some property inherent to the argument of the verb is 'responsible' for bringing about the eventuality" (Levin and Rappaport Hovav 1995:91). This contrasts with the situation for externally caused eventualities, which Levin and Rappaport Hovav describe as eventualities that "… by their very nature imply the existence of an 'external cause' with immediate control over bringing about the eventuality … an agent, an instrument, a natural force, or a circumstance." Levin and Rappaport Hovav (1995:90) illustrate this contrast via examination of the verbs *shake* and *shudder*, which at first blush appear to be synonymous, but turn out to have subtle differences in the direction suggested by the internal/external cause distinction.

(52) a. Kim shuddered at the thought of going there.
b. The house shook under the force of the earthquake.

(53) a. #The thought of going there shuddered Kim.
b. The force of the earthquake shook the house.

Levin and Rappaport Hovav's observations (which they attribute to Anthony Kroch) are first, that while *shudder* fails to participate in the causative alternation, as shown by the data in (53a), *shake* does alternate, (53b). This fact they attribute to *shudder* being internally caused and *shake* being externally caused. As evidence for this, they examine the kinds of things that can *shudder* and *shake*, observing that "... the set of things that shudder [is] to a large extent a subset of the set of things that shake ..." and "things that shudder usually can be thought of as having a 'self-controlled' body; they include people, animals, and perhaps by forced extension, the earth, engines, machinery, and vehicles. In contrast, leaves, teacups, and furniture, none of which can be said to have a 'self-controlled' body, can only shake" (Levin and Rappaport Hovav 1995:100). This distinction between internally caused and externally caused eventualities, then, is linked to the causative-inchoative alternation in that it is only those eventualities which can be caused by an entity external to the argument of the caused event that can participate in the causative-inchoative alternation. As observed by Levin and Rappaport Hovav, *shake* names such an event, while *shudder* does not.

The distinction between internally and externally caused eventualities is murky, and when used as an explanation for participation in the causative-inchoative alternation, can verge on circularity.[12] Nevertheless, despite these difficulties, I believe that there is something to the distinction, a conclusion suggested by converging evidence from the corpus-based and psycholinguistic studies of Wright (2001,2002) and McKoon and Macfarland (2000, 2002).[13] More importantly in the present context, I believe that Ulwa verb class morphology is sensitive to this distinction. The observation is that while there are both externally caused and internally caused events named by *–pa/ta–* verbs, only externally caused events are named by *–da/wa–* verbs. Externally caused events, when named by a *–pa/ta–* verb, are transitive, and when named by a *–da/wa–* verb are intransitive, consistent with the ideas (a) that externally caused eventualities are lexicalized

[12]Despite these concerns, I do believe that it may be possible ultimately to formalize the distinction between internally and externally caused eventualities by drawing on the tools of formal semantics. The work of Piñón (2001a) and Chierchia (2004) is particularly relevant here, and I believe could form the basis for a more formal approach and ultimately a better understanding of the internal/external cause distinction. This work, however, lies beyond the scope of this dissertation.

[13]These studies, though generally supporting the Levin and Rappaport Hovav (1995) contrast between internal and external causation show that the situation is more complicated, in particular with respect to the causative-inchoative alternation. In particular, they show that internally caused COS verbs, contra Levin and Rappaport Hovav (1995), can indeed participate in the causative-inchoative alternation. Nevertheless, it is only in a highly restricted set of circumstances, a finding which entails only minor modification to the analysis of Levin and Rappaport Hovav (1995).

as two participant eventualities and (b) that *–da/wa–* perform an anticausativizing function. The internally caused senses surfacing as *–ta/pa–* verbs, for their part, are senses that must surface as *–ta/pa–* verbs, given that *–da/wa–* anticausativize causative COS senses and that internally caused events are single participant events, which therefore cannot be anticausativized. The evidence for these claims comes from two sources. First, I discuss the kinds of COS events found in the two classes, showing that the kinds of events named by verbs of the two classes is consistent with this distinction. I then show that this has consequences for the causative-inchoative alternation.

Different kinds of events

Consistent with Levin and Rappaport Hovav's characterization of the properties of the single argument of internally versus externally caused verbs, it seems that the single argument of *–ta/pa–* COS intransitives does play a role in bringing the eventuality to fruition. This stands in contrast to the properties of the single argument of *–da/wa–* verbs. In this section, I consider facts supporting this position.

First, simply consider the kinds of events named by intransitive *–ta/pa–* versus *–da/wa–* COS verbs. Lists of such verbs in each of the morphological classes are given in (54)–(57).

(54) Intransitive COS verbs in the *–ta–* class (some also have a transitive sense)
auhnaka 'become fat'; buhnaka 'become dry (e.g. clothes)'; dutnaka 'spoil/rot'; lalahnaka 'ripen, rot'; lapusnaka 'be/become baggy/sag'; pakapnaka 'stiffen, become rigid'; pânaka 'grow'; paunaka 'turn red'; pînaka 'become blind, dry up (eyes)'; pulunaka 'flower, blossom'; pupuhnaka 'swell'; puruhnaka 'become sunken (cheeks, eyes)'; putnaka 'billow (smoke)'; ripnaka 'cool off'; bangnaka 'become full'; damnaka 'sweeten'; sapaknaka 'sour, ferment, spoil'; siunaka 'be fully developed, but not ripe'; tapalhnaka 'spoil, become bitter'; tipitnaka 'congeal, coagulate, harden'; tubaknaka 'become thick/overgrown (e.g. trees)'; wirunaka 'shrivel, dry out (green, unripe fruit)'; nanaknaka 'curdle'; puling-naka 'blister'

(55) Intransitive COS verbs in the *–pa–* class (some also have a transitive sense) ingnaka 'become light/light up'; baknaka 'rot, perish, get/be drunk'; wanihnaka 'become pregnant again'; babarnaka 'become thin'; amatnaka 'swell (river)'; batanaka 'become a man'; rukuhnaka 'become bumpy/break out in hives'; tutuhnaka 'become bumpy/break out in hives'; lusuhnaka 'become flaky'; lamnaka 'calm (e.g. body of water)'; lamatnaka 'swell (water)'; dalaunaka 'become gooey'; rainaka 'form slick on water'; aisaunaka 'disappear'; buhutnaka 'become cloudy'; barahnaka 'burn partially/incompletely'; minisihnaka 'become dirty'; tînaka 'become rusty/get out of practice'; disnaka 'become silent, quiet down'; dasinaka 'become strong'; wasaknaka 'become tangled, become embroiled in a fight'; lilisnaka 'become tattered, ragged'; witnaka 'become used up'; tatasnaka 'get dirty'; ahaunaka 'loosen, become loose'; raunaka 'ripen, but not fully, just before softening'; bisinaka 'shrink by losing some'

(56) COS verbs in the *–da–* class (all *–da–* verbs are intransitive) abaldanaka 'go bad'; abukdanaka 'capsize'; alhdanaka 'burst'; babardanaka 'become thin'; baradanaka 'become dark'; barasdanaka 'become black'; birhdanaka 'tear, rip, shred'; birikdanaka 'cover oneself'; bukdanaka 'chip, crack'; dakdanaka 'snap, sever completely'; didiudanaka 'stretch/become stretched'; dulukdanaka 'get soaked'; kalhdanaka 'crush, break'; karadanaka 'melt/dissolve'; karhdanaka 'become stuck'; kingdanaka 'become clogged'; kubitdanaka 'bend at joint'; kumdanaka 'catch fire'; kurudanaka 'become unstitched'; lamatdanaka 'dent, become dented, collapse'; lisdanaka 'split/cleave'; luhusdanaka 'foam/froth'; muhdanaka 'wake up'; patdanaka 'burst, rupture, pop'; pildanaka 'chip/flake'; pitukdanaka 'turn inside out'; puidanaka 'cool/become lukewarm'; puradanaka 'become wet'; pusingdanaka 'swell'; raidanaka 'become slicked with oily sheen on surface'; raudanaka 'stand up/get up (from bed)'; rîdanaka 'open (sail)'; rubukdanaka 'become shorter'; sangdanaka 'turn green'; sayakdanaka 'become dislocated'; siritdanaka 'become wrinkled'; subitdanaka 'come loose'; suihdanaka 'break; snap off'; takdanaka 'chip, flake off, peel'; tarakdanaka 'tangle'; turudanaka 'flake (skin)'; ulangdanaka 'be or become mucky'; uluhdanaka 'loosen'; urundanaka 'curl up in fetal position'; warindanaka 'become crooked';

wiridanaka 'become twisted'; wiringdanaka 'inflate'; yamdanaka 'become'; yûhdanaka 'lengthen/become long'; yurahdanaka 'open mouth'

(57) COS verbs in the *–wa–* class (all *–wa–* verbs are intransitive)
alawanaka 'grow'; ituwanaka 'grow in size'; mahwanaka 'fill (stomach)'; purawanaka 'become wet (on purpose)'; sikwanaka 'become larger'; singwanaka 'heal/awaken'; bahwanaka 'break'; nakawanaka 'wound self'; dakwanaka 'rip, tear, break'; dâwanaka 'burn'; diswanaka 'go out, stall'; îwanaka 'die, be sick'; lahwanaka 'boil, cook'; sahwanaka 'split, crack open, burst'

Intransitive COS events in the *–ta/pa–* classes, speaking on a very general level, seem to be events which in some sense are brought about by their single argument. These are events such as spoiling, rotting, blossoming, fermenting, swelling (water), calming (water), ripening (fruit), becoming dry (clothes), becoming nearly ripe (fruit), congealing (fat), curdling (milk). In contrast, those in the *–da/wa–* class seem more to involve some sort of external cause, events such as breaking, tearing, cracking, cooking, loosening, getting soaked, etc.

More convincing than simply looking at these glosses, however, is evidence coming from "doublets." It turns out that there are certain roots that have COS intransitives in both the *–ta/pa–* and the *–da/wa–* classes. Whenever this happens, the COS verb in the *–ta/pa–* class seems to have more of an internally caused type meaning contrasting with the more externally caused type meaning of the *–da/wa–* doublet. The first example comes from the root *sah–*, which forms a verb not only in the *–ta–* class, but in the *–wa–* class as well. This is illustrated by the data in (58), with an example in which the root surfaces as an intransitive *–ta–* verb in (58a) and as an intransitive *–wa–* verb in (58b).

(58) a. Kat-ki-taramah suma-ka aslah watah dai ya sah-t-ida.
chicken-1sing egg-3sing one have past def split-ta-3sing.past
'The one egg that my chicken had hatched.' (i.e., a chick emerged from it; notes, 988)

b. Kuring-ki tunak sah-w-ang ya sau pau-ka
canoe-1sing head crack-wa-3sing.prfct def earth red-adj

kah-ta-yang.
paint-TA-1SING.PRES
'I am caulking the crack in the prow of my canoe.' (Green 1999:242)

The contexts of use of the *–ta–* verb in (58a) with a chick hatching and the *–wa–* verb in (58b) with a crack in a canoe in (58b) are not accidental. As it turns out, different senses are available to the root depending on the morphological class in which it is used. This is illustrated by the data in (59).

(59) Kat-ki-taramah suma-ka aslah watah dai ya sah-w-ida.
chicken-1SING egg-3SING one have PAST DEF split-TA-3SING.PAST
a. 'The one egg that my chicken had cracked.' (i.e., something happened to it, and it cracked prior to the time it was supposed to, thereby preventing a chick from hatching; notes, 988)
b. # 'The one egg that my chicken had hatched.' (i.e., a chick emerged from it; notes, 988)

In the example in (59), there is crucially an inference that a chick did not emerge from the egg alive; instead, the egg got cracked somehow, *preventing* it from hatching, i.e. killing the chick. In terms of the internal/external cause distinction under discussion, for the *hatch* sense of *sah–*, which surfaces in the *–ta–* class, it seems fair to say that the single argument of the verb itself causes the eventuality to come about; there is no real sense in which there is a cause external to a chick that is responsible for it hatching. In contrast with the single argument of its *–wa–* counterpart, however, as the data in (59) clearly show, it is a completely different matter—there is by necessity a cause external to the chick responsible for causing the cracking of the egg, and ultimately for the death of the chick. This root, then, when used as an intransitive verb in the *–ta–* class has an internally caused sense, while it has an externally caused sense when used as a *–wa–* class intransitive.

Not to be overlooked in this discussion is the fact that there are transitive uses of the root *sah–* as well, as illustrated by the data in (60).

(60) Yang pan as ahai-t-ikda ya yan sah-t-uting.
1SING log one bring-TA-1SING.PAST the tomorrow split-TA-1SING.FUT
'Tomorrow I am going to split this log that I brought.' (dict.)

The example in (60) illustrates a canonical externally caused verbal sense—in it, there is a cause (an agent) external to the log, causing it to become cracked. As there are no transitive senses in *–wa–* or *–da–*, this transitive use is necessarily in the *–ta–* or the *–pa–* classes, in this case the former. Thus, for the root *sah–* in the *–ta–* class, there are both externally caused (transitive) and internally caused (intransitive) senses. This contrasts with the situation for the *–wa–* class, for which there is only an externally caused sense, corresponding to the transitive, externally caused sense of the *–ta–* verb highlighted in (60).

Another doublet example supporting the claim that *–da/wa–* intransitive COS verbs are externally caused while *–ta/pa–* intransitive COS verbs are internally caused parallels Levin and Rappaport Hovav's (1995) *shake/shudder* example. The root *isi–* broadly means something like 'shake'. When used as a *–da–* class verb, as in (61a), it has a meaning consistent with external causation. When used in the *–pa–* class, however, it means something like 'shake', though it is used only in the case of the earth shaking, as in an earthquake, something which doesn't obviously have a cause external to the earth itself. This latter sense is illustrated by the data in (61b).

(61) a. Balauh ya Andrew yam-ka yam-ta-sa dai bahangh
table DEF Andrew good-ADJ make-TA-3SING.NEG PAST.AUX SO
yam-ka sak-wa-sa. Isi-d-ai.
good-ADJ stand-WA-3SING.NEG. Shake-DA-3SING.PRES
'The table does not stand well, because Andrew did not make it well. It shakes.' (notes, 1020).

b. Asang isi-p-ai.
earth/village shake-PA-3SING.PRES
'The earth/village shakes.' (notes, 1046)

There is not any obvious external event that causes an earthquake, though a table might shake as a result e.g. of just walking around a rickety house. This difference between the *–pa–* and *–da–* class variants surfaced naturally in the naturally occurring example in (62).

(62) Asang isi-p-ai kau asang isi-d-ai.
earth/village shake-PA-3SING.PRES when earth/village shake-DA-3SING.PRES
'When the earth shakes (quakes), the village shakes.' (notes, 1020, nat. occurring)

The verb used to describe the shaking of the earth is in the *–pa–* class, while the one used to describe what happens to to village when the earth shakes is in the *–da–* class. In the example in (62), the earthquake is the external cause of the shaking of the village, the former being an internally caused event, the latter externally caused. As in the example discussed above with the *–ta–* class *sahnaka*, which has uses both as an externally caused transitive and as an internally caused intransitive, the same is true for *–pa–* class *isinaka*, as shown by the internally caused intransitive uses in (61) and (62) alongside the externally caused transitive use in (63).

(63) Andrew w-î balauh ya wâ-t-i isi-p-ida.
Andrew come-SS table the grab-TA-SS shake-PA-3SING.PAST
'Andrew came, grabbed, and shook the table.' (notes, 1020)

As with the *sah–* doublet, what is found for *isi–* is that the root has a transitive externally caused sense in *–ta/pa–*, an intransitive internally caused sense in *–ta/pa–*, as well as an intransitive externally caused sense in *–da/wa–*.

A final example illustrating the same phenomenon comes from doublets with the root *birh–*, which as a *–pa–* class verb denotes a stinking event, while as a *–da–* class verb it denotes a tearing event, as illustrated by the sentences in (64).

(64) a. Dî î-w-ang birh-p-ai ya, ai pan wal-t-i
thing die-WA-3SING.PRFCT rank-PA-3SING.PRES DEF what INTERR find-TA-SS

tal-nauh.
look-2PL.IMPER
'Go find out what the dead thing that reeks is.' (notes, 984)

b. Asna ya andih birh-d-ida.
cloth/shirt DEF already tear-DA-3SING.PAST
'The cloth/shirt is already torn.' (notes, 985)

While something dead naturally progresses to a state of stench on its own, we do not typically conceive of cloth/shirts as progressing on their own to a state of torness. When they are torn, we typically envision this happening as a result of some external cause. Now, it is possible, of course, to conceive of clothing becoming torn and ragged simply as a result of becoming old, part of the natural progression of any entity. Interestingly, however, this kind of eventuality in Ulwa is described with a verb different from the *–da–* class *birhdanaka* in (64). Instead, such an eventuality is described using the *–pa–* class verb *lilisnaka*, a verb with a different root, as shown in (65). This fact further supports the claim that internally caused COS events are in the *–ta/pa–* classes, not the *–da/wa–* ones.

(65) Kahlu balna bû ya lilis-p-ida.
shirt PL two the shred-PA-3SING.PAST
'The two shirts have turned to rags.' (notes, 1058)

Finally, as with the other examples reviewed above, the *–ta/pa–* variant has not only an intransitive internally caused sense, but also a transitive externally caused sense, which itself corresponds to the intransitive externally caused sense which shows up in *–da/wa–*. A transitive externally caused use of the *–pa–* class verb *birhnaka* is given in (66).

(66) Lîma dam-ka ya sipitnak karak alh-p-i û-ka-tak ya birh-p-i
lime sweet-ADJ the fingernail with poke-PA-SS skin-<3SING> the tear-PA-SS
yak-naka.
take.off-3SING.INF
'We have to poke the skin of the sweet lime with our fingernail in order to rip

and take off its skin.' (dict.)

The overall conclusion, then, is that *–da/wa–* intransitive COS verbs are externally caused, while *–ta/pa–* verbs have available to them both internally caused intransitive and externally caused transitive senses. As I show in the section that follows, data from the causative-inchoative alternation support this conclusion.

The causative-inchoative alternation

The clearest morphosyntactic diagnostic suggested by Levin and Rappaport Hovav (1995) for determining whether a predicate is internally or externally caused is participation in the causative-inchoative alternation, the prediction being, as discussed above, that only externally caused verbs alternate. In Ulwa, this diagnostic reveals a distinction between COS verbs in the *–ta/pa–* classes and those in the *–da/wa–* classes—while intransitive verbs in the former class sometimes alternate, those in the latter class almost always do. Further, even when intransitive verbs in the *–ta/pa–* classes alternate, they do so in a morphological manner very different from the manner in which the *–da/wa–* verbs do, failing to show any difference in morphological class between causative and inchoative, both variants appearing in *–ta/pa–*. These facts, alongside the lexical semantic facts discussed in the previous section, further support the descriptive conclusion that only externally caused COS senses are found among the *–da/wa–* verbs while both internally and externally caused senses are found among the *–ta/pa–* verbs.

Consider first COS verbs in the *–da/wa–* classes, such as those given in (67).

(67) a. Asna ya andih birh-d-ida.
cloth DEF already tear-DA-3SING.PAST
'The shirt/cloth already tore.'

b. Tulh-ki balna ya bah-wa-dida.
machete-1SING PL DEF break-WA-3PAST.PL
'My machetes broke.' (notes, 1059)

As discussed above, verbs in these classes are always intransitive. More importantly, it turns out that COS verbs in these classes always have transitive counterparts in the

–ta/pa– classes. This is illustrated by the data in (68), transitive counterparts of the *–da/wa–* verbs in (67).

(68) a. As-ki-na ya wakal raupi birh-p-ida.
cloth-<1SING> DEF thorn RAUPI tear-PA-3SING.PAST
'The thorn ripped my shirt.' (notes, mar06-15)

b. Arak-ki-bus bah-t-ikda.
gun-<1SING> break-TA-1SING.PAST
'I broke my gun.' (dict.)

These data illustrate the fact that COS verbs in the *–da/wa–* classes have transitive counterparts in the *–ta/pa–* classes. At the same time, there are very few non-alternating COS verbs in the *–da/wa–* classes. This is illustrated by the lists already given in (14)–(16), which show for *–da/wa–* COS verbs in the Ulwa dictionary, whether there is a transitive counterpart, and if so, in which class.[14] What the lists show is that COS verbs in the *–da/wa–* classes almost always have transitive/causative counterparts, which are always in the *–ta/pa–* classes. This kind of consistent causative-inchoative alternation, illustrated by the examples in (67) and (68), is a hallmark of external causation, according to Levin and Rappaport Hovav (1995) and those their work is based on.

In contrast, there is a relatively large class of intransitive *–ta/pa–* verbs (a) many of which do not alternate and (b) even if they do alternate, do not do so across morphological verb classes, having both transitive and intransitive counterparts in the same morphological verb class. The first of these observed possibilities, non-alternation, was already illustrated by the data in (31) and is further illustrated by the data in (69)–(73).

(69) *batanaka* 'become a young man'

a. Baka-ki al ya andih bata-p-ai bahangh tukka tî-ka
child-1SING male DEF already man-p-3SING.PRES SO work heavy-ADJ
balna yam-t-i yâ-tai.
PL do-t- 1SING-give-3SING.PRES

[14]It is not always the case that the transitive counterpart is found in the Ulwa dictionary; some of the examples I have collected and they do not yet appear in the Ulwa dictionary.

'Since my son is fast becoming a man he does the heavy work for me.' (Green dict.)

b. *Yang (raupi) baka-ki al ya bata-p-uting.
1SING (SUBJ) child-1SING male DEF man-p-1SING.FUT
'I will raise my son into a man.' (intended; notes, 474)

(70) *pânaka* 'grow'

a. Anu ya lau-t-ikda kau yam-ka pâ-t-ida.
coconut DEF plant-t-1SING.PAST when good-ADJ grow-t-3SING.PAST
'When I planted the coconut tree, it grew well.' (notes, 942)

b. *Anu pâ-t-ikda ya andih î-w-ida.
coconut grow-t-1SING.PAST DEF already die-w-3SING.PAST
'The coconut tree that I raised has already died.' (intended)

(71) *babarnaka* 'become thin'

a. Sûlu as watah yang katka babar-p-ida bahangh
dog INDEF have 1SING but thin-PA-3SING.PAST so
wal-ta-sing.
want-TA-1SING.NEG
'I have a dog that has become thin, so I no longer want him/her.' (notes, 449)

b. *Yang raupi sû-ki-lu babar-p-ikda, kanas auhka dai bahangh.
1SING RAUPI dog-1SING thin-PA-1SING.PAST more fat-ADJ PAST.COP SO
'I thinned my dog up because he was so fat.' (notes, 968)

(72) *tubaknaka* 'become overgrown (trees, shrubs)'

a. Û dipih-ka, was lau-t-ai kau sirih-ka tubak-t-ai.
house lawn water fall-TA-3SING.PRES when fast-ADJ thick-TA-3SING.PRES
'When it rains, the lawn quickly becomes overgrown.' (notes, 970)

b. *Û-ki dipih-ka tubak-t-uting.
house-1SING lawn-3SING thick-TA-1SING.FUT
'I am going to overgrow my lawn.' (notes, 970)

(73) *tipitnaka* 'congeal'

a. Turuh auh-ka balna tipit-t-ai.
cow fat-3SING PL congeal-TA-3SING
'The fat of the cow congeals.' (notes, 969)

b. *Turuh auh-ka ya tipit-t-uting.
cow fat-3SING DEF congeal-TA-3SING.FUT
'I'm going to congeal the fat of the cow.' (notes, 969)

In contrast, there are other intransitive COS verbs in the *–ta/pa–* classes that do participate in the causative-inchoative, as shown in (74) and (75).

(74) *puruhnaka* 'sink, deepen'

a. Bâwas, tining karak yak wat-ya kau, mâ bû datak
diarreah vomit with 1PL.INCL catch-3SING when day two after
mikdi-ni ya andih puruh-t-ai.
eye.1PL.INCL DEF already deep-TA-3SING.PRES
'After two days of diarrhea and vomiting our eyes are already sunken.' (dict.)

b. Yang nuh-ki ya kanas puruh-ta-yang, pihmak ya kanas isau
1SING mortar-1SING DEF more deep-TA-1SING.PRES rice DEF more much
wat-rang yulka.
fit-3SING.IRR because
'I'm deepening my mortar so it will hold more rice.' (dict.)

(75) *auhnaka* 'become fat'

a. Kasnaka dî-ka mah-ka kas-ring laih auh-ta-ring.
food thing-3SING much-ADJ eat-3SING.IRR if fat-TA-1SING.IRR
'If I eat a lot I will become fat.' (dict.)

b. Sû-ki-lu auh-t-ikda.
dog-1SING fat-TA-1SING.PAST
'I fattened my dog up.' (notes, 968)

In contrast to the situation with the alternating verbs in (67)–(68), where the intransitive and transitive variants fall into different morphological classes, however, with the alternations in (74) and (75), there is no change in morphological class associated with the transitivity alternation. Instead, both intransitive and transitive are in the *–ta/pa–* classes.

Summarizing, *–ta/pa–* intransitive COS verbs are less likely to participate in the causative-inchoative alternation than their *–da/wa–* counterparts. If they do, however, the causative alternate is always in the same morphological class as the inchoative alternate, in contrast to the situation with the *–da/wa–* inchoatives. This behavior is consistent with *–da/wa–* COS verbs being externally caused and intransitive COS verbs in *–ta/pa–* being internally caused. Transitive verbs in the *–ta/pa–* class, which alternate with the *–da/wa–* intransitive COS verbs, also display characteristics of externally caused COS verbs. The overall behavior, then, is consistent with *–ta/pa–* having no lexical semantic impact on the root. The *–da/wa–* suffixes for their part, perform an anticausativizing operation on COS-denoting roots they suffix to, an operation that can be performed only on externally caused COS senses, as discussed by Levin and Rappaport Hovav (1995:Chapter 3) and in Chapter 8. In the next section, I go on to show that the proposed description of the functions of *–ta/pa–* and *–da/wa–* help explain some otherwise curious and previously unexplained facts about their morphological behavior.

5.6 Morphological asymmetries

In this section I discuss two asymmetries in the morphological behavior of *–ta/pa–* and *–da/wa–* class verbs and suggest that these asymmetries are not unexpected in light of the morphosyntactic and lexical semantic properties of *–ta/pa–* and *–da/wa–* verbs discussed above.

5.6.1 Asymmetry 1: The morphology of infinitives

The first contrast in the morphological behavior of *–ta/pa–* verbs as compared to *–da/wa–* verbs is that while the *–ta/pa–* affixes are absent in the infinitival forms of verbs of those classes (76), *–da/wa–* are present in the infinitival forms of these verbs (77).

(76) *–ta/pa–* infinitival paradigms

a. *–pa–* class *sangnaka* 'cause to become green'

1sing	sang-ni-ki	1pl.excl	sang-ni-kina
		1pl.incl	sang-ni-ni
2sing	sang-na-ma	2pl	sang-na-mana
3sing	sang-na-ka	3pl	sang-na-kana

b. *–ta–* class *sahnaka* 'split'

1sing	sah-ni-ki	1pl.excl	sah-ni-kina
		1pl.incl	sah-ni-ni
2sing	sah-na-ma	2pl	sah-na-mana
3sing	sah-na-ka	3pl	sah-na-kana

(77) *–da/wa–* infinitival paradigms

a. *–da–* class *sangdanaka* 'become green'

1sing	sang-**da**-ni-ki	1pl.excl	sang-**da**-ni-kina
		1pl.incl	sang-**da**-ni-ni
2sing	sang-**da**-na-ma	2pl	sang-**da**-na-mana
3sing	sang-**da**-na-ka	3pl	sang-**da**-na-kana

b. *–wa–* class *sahwanaka* 'crack'

1sing	sah-**wa**-ni-ki	1pl.excl	sah-**wa**-ni-kina
		1pl.incl	sah-**wa**-ni-ni
2sing	sah-**wa**-na-ma	2pl	sah-**wa**-na-mana
3sing	sah-**wa**-na-ka	3pl	sah-**wa**-na-kana

I believe this asymmetry follows rather straightforwardly from the lexical semantic differences between *–ta/pa–* and *–da/wa–* highlighted above. First, the infinitival forms of Ulwa verbs are *nominal*, as pointed out by Green (1999:Chapter 7). The *–na* (or *–ni* under certain phonological conditions) is a noun-deriving suffix, while the *–ki*, *–ma*, etc. are part of the nominal possessive morphology of the language, as can be seen in (78).

(78) Nominal possessive paradigm (Green 1999:78)

1SING	–ki	1PL.EXCL	–ki-na
2SING	–ma	2PL	–ma-na
3SING	–ka	3PL	–ka-na
		1PL.INCL	–ni

Since *–ta/pa–* merely alter the lexical category of a root without effecting changes in its lexical semantics, there is no need for their presence in the infinitival form of verbs, assuming that *–na* can derive a noun directly from the root. In contrast, with the *–da/wa–* infinitival forms, the suffixes have to appear, since they effect a change in the lexical semantics. Without these suffixes, the meaning of the root would not be altered and the sense derived via suffixation of *–da/wa–* would not be created. Because of this, *–da/wa–* have to be present, despite the fact that the derived form is actually not a verb at all. In this way, then, the morphological behavior of the verb class suffixes in the infinitival forms of verbs is not at all mysterious; it follows from their lexical semantics.

5.6.2 Asymmetry 2: Finite paradigms

A second asymmetry in the morphological behavior of *–ta/pa–* as compared to *–da/wa–* concerns their appearance throughout finite verb paradigms. While the *–da/wa–* suffixes appear throughout the paradigms in finite forms, *–ta/pa–* suffixes are systematically missing from the first person plural inclusive and from the third person plural forms. This is illustrated by the present tense paradigms of verbs of each of these classes, *–da/wa–* verbs in (79) and *–ta/pa–* verbs in (80).

(79) *–da/wa–* finite paradigms (illustrated by present tense)

a. *–da–* class *sangdanaka*

1sing	sang-**da**-yang	1pl.excl	sang-**da**-yangna
		1pl.incl	yak sang-**da**-i
2sing	sang-**da**-yam	2pl	sang-**da**-yamna
3sing	sang-**da**-i	3pl	sang-**da**-dai

b. *–wa–* class *sahwanaka*

1sing	sah-**wa**-yang	1pl.excl	sah-**wa**-yangna
		1pl.incl	yak sah-**wa**-i
2sing	sah-**wa**-yam	2pl	sah-**wa**-yamna
3sing	sah-**wa**-i	3pl	sah-**wa**-dai

(80) *–ta/pa–* finite paradigms (exemplified by the present tense)

a. *–pa–* class *sangnaka*

1sing	sang-**pa**-yang	1pl.excl	sang-**pa**-yangna
		1pl.incl	sang-wa-i
2sing	sang-**pa**-yam	2pl	sang-**pa**-yamna
3sing	sang-**pa**-i	3pl	sang-da-i

b. *–ta–* class *sahnaka*

1sing	sah-**ta**-yang	1pl.excl	sah-**ta**-yangna
		1pl.incl	sah-wa-i
2sing	sah-**ta**-yam	2pl	sah-**ta**-yamna
3sing	sah-**ta**-i	3pl	sah-da-i

Now, it is not simply the case that where *–ta/pa–* verbs are missing their verb class marker that they have *no* marker. Instead, in the first person inclusive, in place of either *–ta–* or *–pa–*, there is instead, systematically, *–wa–*. Similarly, in the third person plural cell, where *–ta–* is missing from otherwise *–ta–* verbs and *–pa–* is missing from otherwise *–pa–* verbs, instead *–da–* is found. Were it the case that these forms were simply missing a verb class marker, or even if the verb class marker were of some random phonological shape, there might be nothing else to say. Instead, however, it seems extremely unlikely that it is accidental that there do exist *–da–* and *–wa–* suffixes and that these suffixes appear where we otherwise would expect *–ta/pa–*.

The evidence discussed above suggested that *–da–* and *–wa–* are markers of the middle voice. Though I have primarily been concerned with the anticausativization function of middle voice morphology, according to Kemmer (1993:178), the middle voice is also commonly used for impersonal constructions. This, it turns out, is also a common function of the first person inclusive in Ulwa (cf. Benedicto and Hale 2000), as illustrated by the examples in (81).

(81) a. Dî ing-ka ya bai kaupak tal-wai ka.
thing light-ADJ def far from see-1PL.INCL SENT-KA
'Bright things can be seen from afar.' or 'One sees bright things from afar.' (dict.)

b. Dî muih-ka sau kau wauh-d-ang ya yam-ka
thing meat-3SING dirt on fall-DA-3SING.PRFCT DEF good-ADJ
suh-wa-sa lah-wa-i kau akas-ka ka.
clean-WA-1PL.INCL boil-WA-1PL.INCL when gritty-ADJ SENT-KA
'When meat has fallen on the ground and we do not wash it well before cooking, it is gritty.' or 'When meat has fallen on the ground and one has not washed it well before one cooks it, it is gritty.' (dict.)

While more research is required, what seems to be going on is that the presence of the *–wa–* in what has hitherto been called the first person inclusive form has something to do with the middle voice, possibly with impersonal uses of the verb.

As for the 3pl form of *–ta/pa–* verbs, the situation is not yet entirely clear though it is perhaps worth noting that the 3pl form of *–ta/pa–* verbs is the same as the 3sing of *–da–* verbs based on the same root. That is, the suffix to the root of 3pl *–ta/pa–* forms includes a *–da–* suffix. Given, though, that *–da–*, like *–wa–*, seems to have a middle voice type distribution and the fact that crosslinguistically 3pl forms often have impersonal-like uses, perhaps some link can be made between the fact that 3pl have *–da–* and the other middle voice functions of *–da–*.

5.7 Consequences for the Monotonicity Hypothesis

In this chapter, I have taken up the primarily descriptive task of laying out the facts of Ulwa verb class morphology, as a preliminary to understanding the relationship of words naming states to words naming changes of state in this language. What the facts show is that so far as COS verbs are concerned, the *–da/wa–* markers perform an anti-causativizing function, while *–ta/pa–* have no impact on the lexical semantics of roots to which they suffix. Instead, they allow the meaning of the root to surface unaffected.

In this way, it appears as though we have access to the meaning of Ulwa roots by way of examination of the meanings of *–ta/pa–* verbs, since *–ta/pa–* have no impact on their meanings. This observation has significant implications for the understanding of how words naming property concept states and words naming COS events are related to one another in this language. As a consequence, the relationship between states and changes of state in Ulwa appears to be as in (1), repeated in (82).

(82) Ulwa states and changes of state

	adj. state (noun)	non-causative COS	causative COS	
a.	sang-ka	sang-da–	sang–	green/blue
b.	yûh-ka	yûh-da–	yûh–	long, tall
c.	baras-ka	baras-da–	baras–	black
d.	bara-ka	bara-da–	bara–	dark
e.	warin-ka	warin-da–	warin–	bent
f.	sik-ka	sik-wa–	sik–	large
g.	pura-ka	pura-wa–	pura–	wet

On the basis of the finding that the meaning of the bare root seems to surface in the *–ta/pa–* verb classes, it appears that so far as the relationship between states and changes of state are concerned, the root denotes a causative COS event. From this, in turn, are derived a stem denoting a non-causative COS event, via an anticausativization operation marked by *–da/wa–*, and the property concept state denoting word, via an operation marked by *–ka*.

Both of these derivations, on initial appearances, seem to be ones that remove decompositional operators, on the basis of our understanding of the meaning of states and changes of state, in direct violation of the MH. Anticausativization is a more general problem known in languages beyond Ulwa, e.g. Romance, which I take up in Part III. The derived property concept words, however, are much more typologically curious; I know of no other languages in which words naming property concept states even appear on the surface to be derived from words naming changes into those states.

More precisely, it appears that the meaning of the root *sang–* in (82a) is as in (83), i.e., a four-part relation between ordinary individuals, stative eventualities, and events such that there is an event in which an ordinary individual y is a participant that causes a change into a state of greenness in another ordinary individual x.

(83) $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, green, x)]]$

What the suffix *–ka* appears to do, then, is to mark a derivation of a word naming the property concept state from the causative COS denoting root. The result of this derivation would be as in (84).

(84) $\lambda x \lambda s[green(s, x)]$

If this is the right description of the facts, then the the putative derivation marked by *–ka* would be one that deletes both the CAUSE and the BECOME operators from the lexical semantic representation of the root, in direct violation of the MH. In light of this, in the next chapter, I undertake a detailed investigation of the *–ka* suffix and the derivation it marks.

Chapter 6

Derived property concept words in Ulwa

In the preceding chapter I laid out the system of Ulwa verb class morphology which is intimately involved in the relationship between words naming states and changes of state in the language. The results of the discussion revealed that bare roots appear to name causative COS events, with words naming property concept states derived from these, in apparent violation of the Monotonicity Hypothesis. Further investigation of Ulwa property concept words shows that it is not actually the case that they need always appear suffixed with *–ka*—the roots on which adjectives (and COS verbs) are built can appear without *–ka*, though still with a property concept meaning, as illustrated by the data in (1).

(1) a. sang-ka
'green/blue'
b. sang
'green/blue'

This suggests, I argue, that these roots, contrary to initial appearances, do indeed have a stative meaning. This finding, however, raises the question of what the nature of the derivation marked by *–ka* is. Based largely on distributional differences between the property concept words with and without *–ka*, I argue that *–ka* derives a syntactic word from a bound root. The bound root, for its part, is neither entirely bound nor entirely free; instead, it can be used freely in a small set of syntactic environments. The *–ka* derived words, however, are shown to have a larger syntactic distribution—the syntactic word that *–ka* derives is of lexical category noun. This finding explains not only some of the peculiar morphosyntactic facts of Ulwa property concept words, but also makes sense in the context of property concept words across the Misumalpan languages more broadly.

Upon laying out the facts showing that *–ka* is simply a marker of a derivational operation deriving syntactically free nominal words from bound roots, I return to the question of the relationship between words naming states and changes of state. Although the data on *–ka* suggest that the meaning of roots upon which property concept words are derived is stative, the results of the previous chapter suggest that these roots have a causative COS meaning. I address this apparent paradox, drawing on additional data showing that (a) some roots are polysemous, having synchronically unrelated state and COS senses and (b) roots that are not polysemous have either a property concept state meaning or a COS meaning. For the roots that fall into the latter category, I show, consistent with the MH, that roots lexicalized with COS meaning do not have *–ka* suffixed property concept word derivatives. It is only the other set of roots, those lexicalized with property concept state meanings, that form words naming property concept states. The facts, then, although complicated, are shown to be entirely consistent with the MH.

6.1 Ulwa property concept words in more detail

6.1.1 Ulwa *–ka* derives free syntactic words from roots

Among the most important pieces of evidence supporting the claim that *–ka* does not alter the lexical semantics of roots is the fact that it actually need not be present for a property concept state meaning to arise with many roots.[1] This fact is illustrated by the data in (2), where the property concept word appears in bold.

[1] Green (1999:134) makes this observation for a small set of property concept words noting the need for additional work on the topic.

(2) a. Bikiska muih-kana yam-ka kau wâ-ti ihil-tayam kau **kangh**
child body-3PL good-ADJ when grab-ss lift-2SING.PRES when heavy
balna ka.
PL SENT-KA
'When a child's body is healthy when you grab him/her and lift him/her up they are heavy.' (notes, 151)

b. Muih-ma ya **yam** lau man.
body-2SING DEF good sit 2SING
'You're looking good.' (lit: You are sitting with your body well.) (nat occ.)

c. Pan as as balna ya **warin** bik lau lau ka.
tree one one PL DEF crooked also sit sit SENT-KA
'There are also some trees that are crooked.' (lit: Some trees also sit crookedly) (notes, 488)

d. Wassik bik **tari** lau ka.
river also curvy sit SENT-KA
'There are also rivers that are curvy.' (lit: Rivers too, sit curvily.) (notes, 454)

e. Kuring **mukul** balna ya tulu-dai dî yabasik-ka.
canoe cylindrical PL DEF roll.over-3SING thing dangerous-ADJ
'When cylindrical canoes roll over, it is a dangerous thing.' (notes, 348)

In the examples in (2), the bolded words have property concept state denotations, despite the fact that they appear without the *–ka* suffix. The *–ka* suffix, then, is not responsible for deriving property concept state meaning from a causative COS denoting root. Instead, it performs an altogether different function.

The first clue as to its true function comes from the fact that a bare root cannot always replace a *–ka* suffixed property concept word. Indeed, in many, perhaps the majority of cases, words naming property concept states are suffixed by *–ka*. This is so for two reasons. First, *–ka* suffixed property concept words can appear in nearly all of the places where the bare root occurs. For example, all of the sentences in (2) with bolded bare property concept denoting roots would have also been acceptable with the *–ka* suffixed version instead. Secondly, however, bare roots cannot be used everywhere that the –*ka* suffixed versions can be used. Indeed, suffixation of –*ka* gives the property concept denoting word a broader syntactic distribution. For example, the sentences in (3) with bold-face –*ka* suffixed property concept words are ones in which, given the syntactic context in which the property concept word is used, the bare roots are generally not found.

(3) a. Kataramah luk-naka wâlik kau **kangh-ka** ka.
chicken lay-3SING.INF only when heavy-ADJ SENT-KA
'When a chicken is about lay an egg, it is heavy.' (notes, 151)

b. Tâpas **adah-ka** ya wât-da-naka **yam-ka** ka.
path short-ADJ DEF walk-INTRANS-3SING.INF good-ADJ SENT-KA
'A short path is good to walk.' (dict.)

c. Muih yâka babar-ka kau **yûh-ka**.
person that thin-ADJ when tall-ADJ
'People who are thin are tall.' (notes, 153)

In the majority of cases I have examined, where a bare root form is used, it is followed by a word that is at least bimoraic in phonological weight (CVCV, CVC, CVV, etc.). This is true for the bolded roots in (2), while it is not true for the bolded –*ka* suffixed words in (3). The bare root seems to have some kind of clitic-like status and requires a word of a minimal phonological shape to host it. That Ulwa should have a constraint like this seems unsurprising in light of the language's well-known sensitivity to phonological weight in its prosodic structure, as evidenced by the facts of stress, infixation, and minimal word constraints (McCarthy and Prince 1998; Green 1999). Turning back to the –*ka* suffix, then, what it does is to turn the root into a free syntactic word with an unrestricted syntactic distribution. This contrasts with the situation for the bare root, which seems not to be a full-fledged free syntactic word, as evidenced by the fact that it requires a word of at least a particular phonological shape following it; it seems that it is, in a sense, parasitic on the syntactic wordhood of the word that follows it.

6.1.2 Suffixed property concept words are nouns

In the previous section, it was shown that what *–ka* does is not to alter the lexical semantic representation of roots it suffixes to but to turn a root into a full-fledged free syntactic word with a particular syntactic distribution. The question addressed in this section is what exactly the syntactic distribution of the *–ka* suffixed words is. In particular, I show that they are nouns, and that Ulwa, in fact, does not have a class of adjectives. This finding explains several otherwise mysterious facts about the grammar of the language, and also helps to shed light on some issues in the comparative morphosyntax of the Misumalpan languages more broadly. More importantly in the context of examination of the MH, by showing what it is precisely that *–ka* does, I make more convincing the claim that it is not marking a derivation that removes operators from the lexical semantic representation of roots, a derivation that would violate the MH.

Possession

The first piece of evidence pointing to the nominal status of *–ka* suffixed property concept words is that they can be possessed like any other noun in the language. Nominal possession in Ulwa is marked on the head of the DP, as illustrated in (4), with the full possessive paradigm given in (5). As exemplified in (4b) for the possessor of *wahai-ki* 'my brother', the possessor (*yang* 'I/me') can be dropped, in a manner Hale and Salamanca (2002) view as reminiscent of pro-drop, a feature which Ulwa also has.

(4) a. Andrew wahai-**ka**
Andrew brother-3SING
'Andrew's brother'

b. (Yang) wahai-ki tulh-**ka**
(1SING) brother-1SING machete-3SING
'My brother's machete'

c. Yang ninih-ki ya suba alh-dang lau-lau ya alas
1SING grandfather-1SING DEF pot perforate-3SING.PRFCT sit-sit DEF 3SING

yam-t-ai dadang.
fix-TA-3SING.PRES AUX.PRFCT
'My grandfather used to fix pots with holes in them.' (dict.)

(5) Ulwa nominal possessive paradigm (Green 1999:78)

1SING	–ki	1PL.EXCL	–ki-na
2SING	–ma	2PL	–ma-na
3SING	**–ka**	3PL	–ka-na
		1PL.INCL	–ni

The important point in the context of the syntactic category of *–ka* suffixed property concept words is that these can also be possessed in a manner identical to other nouns in the language, as illustrated by the data in (6).

(6) a. **Bilam sikamh-ka-ka** raupi y-â-tak kang
fish stinky-3SING-ADJ RAUPI 1SING.NON-NOM-cause-3SING.DS APPL
lâ-wa-yang Bob ya bilam watah ka.
cross-WA-1SING.PRES Bob DEF fish have SENT-KA
'The stinkiness of the fish makes me aware that Bob has fish.' (mar06, 56)

b. **Dut-ki-ki** luk-t-ah.
bad-1SING-ADJ lose-TA-2SING.IMP
'Forget the badness that I did.' or "'My bad", forget it.' (mar06, 123)

c. Pâpangh-ni **dasi-ka-ka** kau baka-ki ya andih ala-t-i
father-1INCL.PL strong-3SING-ADJ with child-1SING DEF already raise-TA-SS
bata-ka yak-t-ikda.
youth-ADJ extract-TA-1SING.PAST
'With the strength of god, I have already raised my child into a youth.' (notes, 474)

In (6a), *sikamh-ka*, a property concept word best glossed as 'stinky', is suffixed with an additional *–ka* suffix, this one being a marker of possession. The presence of this suffix, in turn, licenses the presence of a possessor immediately to its left (in its specifier on most theories). If *sikamh-ka* is a noun, then it makes sense that it can be possessed like any other noun. If it is not a noun, it would have to undergo some sort of zero-derivation from whatever category it is to become a noun to then take the nominal possessive marking. I see no reason to assume zero derivation in this case; instead, especially in light of further evidence below, it seems most reasonable simply to assume that *sikamh-ka* is itself already a noun, the first *–ka* turning the root *sikamh* into a free syntactic word of syntactic category noun. That it is a noun, then, makes it eligible to take possessive inflectional morphology from the nominal domain, like any other noun. The same argument can be made for *dut-ki-ki* ‘my bad’ in (6b), *dasi-ka-ka* in (6c), and other possessed property concept words like them.[2]

Property concept words in argument position

Another strong argument for the nominal status of *–ka* suffixed property concept words is that they can be used in argument positions with a non-elliptical interpretation, as illustrated by the data in (7). Although some researchers are skeptical of the idea that property concept words ever have true nominal behavior (e.g., Beck 2002), even they tend to accept this diagnostic as an argument for nominal status.

(7) a. Yâmak wisam tus-na kau suk-dak lâ-w-ang kau
farm recent chop-INF when ligh-3SING.DS pass-WA-3SING.PERF when
yâkau tuk-wa-yam kau **tatas-ka** mâ
from.there work-WA-2SING.PRES when dirty-ADJ 2SING.NON-NOM
wat-ya.
grab-3SING.PRES
‘When you chop a new farm (in the bush) and burn it, after it’s done burning when you work, you get all dirty.’ [literal: … dirtiness grabs you] (notes, 417)

b. Uba **tarat-ka** raupi bikis-ka balna it il-wa-da-sa. Maybe
much tall-ADJ RAUPI child-3SING PL possible climb-WA-3PL-NEG. maybe

[2]The example in (6b) exemplifies a phonological process in Ulwa whereby the first *–ka* becomes *–ki* in the presence of the first singular possessive marker *–ki*, a kind of vowel harmony. See Green (1999:40ff.) for further discussion.

muih almuk il-wa-naka.
person old-masc climb-WA-3SING.INF
'The great degree of tallness makes it [=the palm tree] such that it is not possible for children to climb it. Perhaps an older man could climb it.' (mar06, 123)

The property concept word *tatas-ka* 'dirty' in (7a) is used in subject position. In contrast to languages like Quechua in which specious arguments for the nominal status of property concept words have been made on the basis of sentences where a property concept word with a meaning such as 'dirty' appears in an argument position with an elliptical interpretation like 'the dirty man/woman' (Beck 2002:145ff.), in (7a) *tatas-ka* refers to the abstract property of dirtiness, and is therefore clearly not the modifier of a noun that is syntactically present, but simply phonologically elided. The same can be said for *tarat-ka* 'tall', which is also used in subject position in (7b) with a non-elliptical interpretation, referring to the abstract property of tallness.

Absence of constructions associated with adjectives

In addition to the arguments above, there are several constructions that are systematically absent from Ulwa that might be expected, or at least would be more likely to be present in the language if it had a class of adjectives. If *–ka* suffixed property concept words belong to a syntactic category other than adjective, however, as the evidence independently suggests, then this finding helps to explain why the language might not have these constructions.

First, Ulwa has no special comparative morphology or construction that singles out property concept words to the exclusion of words of other syntactic categories. This contrasts with languages like English, for example, where the suffixes *–er* and *–est* are commonly taken to suffix only to adjectives (though perhaps not to all adjectives). In Ulwa, however, there is no such affix or particle. Instead, there is a word *kanas* 'more' used in comparative constructions with property concept words, as illustrated by the sentences in (8), for both a normal comparative (8a) and for a superlative, as in (8b), for which Ulwa speakers simply say that something has more of the property in question than anything else in the set of things being compared.

(8) a. Alas laih kanas auh-ka ka yang karak.
s/he TOP more fat-ADJ SENT-KA 1SING with
'S/he is fatter than I am.'

b. Alas laih kanas auh-ka ka muih wâk karak.
s/he TOP more fat-ADJ SENT-KA person other with
'S/he is fatter than anyone else.'

The word *kanas* 'more', however, can modify not only property concept denoting words, but other nouns (9a), verbs (9b), and even larger syntactic constituents like VPs (9c).

(9) a. Yang kanas kas-na kas-naka wal-ta-yang.
1SING more eat-NOMZ eat-3SING.INF want-TA-1SING.PRES
'I want to eat more food.' (dict)

b. Ninih-ki ya mâmâka lâ-wa-i luih kau kanas
grandfather-1SING DEF year cross-WA-3SING.PRES all when more
rubuk-da-i ka.
short-DA-3SING.PRES SENT-KA
'My grandfather gets shorter with every passing year.' (dict)

c. Kal bau-naka wâ-ya ya kanas yâ
RECIP hit-3SING.INF come-3SING.PRES DEF more 1SING.NON-NOM
kapah-ta-i.
problem-TA-3SING.PRES
'The war that is coming troubles me a lot.' (dict)

The generalization for *kanas* 'more' seems simply to be that it can modify any gradable predicate, which includes many property concept words as well as some nouns and verbs. There is no other comparative construction in the language, unlike in English, for example, that singles out a set of property concept words as a privileged set of gradable predicates for special morphosyntactic treatment in the comparative constructions. If the language did have a special class of adjectives, however, it might be expected that it would have special morphosyntactic devices of this kind.

Resultative secondary predication, illustrated by the English construction in (10), is another construction that has been claimed to be possible only for adjectives (Baker 2003).

(10) Kim hammered the metal flat.

Ulwa property concept words are not used in resultative secondary predication constructions, by which I mean one does not hear sentences like (11a) in naturally occurring Ulwa, nor are they generally accepted in elicitation. Instead, the pervasive verb chaining constructions (Hale 1991a; Hale 1997) are used to achieve the same effect, as illustrated in (11b).

(11) a. ?Andrew zinc dak as kau laban-ka tul-p-ida.
Andrew zinc piece one at flat-ADJ pound-PA-3SING.PAST
'Andrew pounded the metal flat.'
b. Andrew zinc dak as kau tul-p-i laban-p-ida.
Andrew zinc piece one at pound-PA-SS flat-PA-3SING.PAST
'Andrew pounded the metal flat.' (notes, 248)

Since resultative constructions are not universal even in languages with adjectives, the absence of such a construction in Ulwa cannot be taken as a strong argument that the language lacks adjectives. On the other hand, resultative constructions are unknown with secondary predicates of syntactic category other than adjective (Baker 2003), so that if Ulwa did have resultatives, it would be hard to argue that it did not also have a class of adjectives. The fact that it lacks resultatives, then, is a piece of circumstantial evidence in favor of the claim that the language lacks a class of adjectives, and that *–ka* suffixed property concept words instead belong to a different syntactic category.

Perhaps the sine qua non of adjective diagnostics is attributive modification of nouns, as illustrated for English in (12a).

(12) a. A big person
b. *An imbecile man

c. *A break vase

Many discussions of syntactic categoryhood consider the ability to attributively modify nouns to be one of the major characteristics of adjectives that distinguishes them from both nouns (12b) and verbs (12c) (Croft 1990; Bhat 1994; Wetzer 1996; Beck 2002; Baker 2003). If *–ka* suffixed property concept words are nouns, then it might reasonably be expected that they would not be able to attributively modify nouns. Now, it turns out that Ulwa does have what might naively be considered to be attributive modification of nouns with property concept words, as illustrated in (13).

(13) Al babar-ka ya tal-ikda.
man thin-ADJ DEF see-1SING.PAST
'I saw the thin man.'

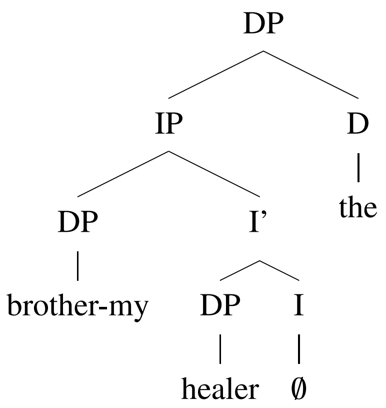
In the case of Ulwa, however, nouns and verbs can appear in exactly this same configuration, as illustrated by (14a,b) respectively.

(14) a. Al wauh-d-ida ya tal-ikda.
man fall-DA-3SING.PAST DEF see-1SING.PAST
'I saw the man who fell down.'

b. Wahai-ki watyu ya damai muih as î-wa-na
brother-1SING healer DEF yesterday person INDEF sick-WA-NOMZ
wâ-t-ak umh-p-ida.
catch-TA-3SING.DS help-PA-3SING.PAST
'Yesterday, my brother who is a healer helped a person who had caught a sickness.' (mar06, 36)

Rather than considering the sentences in (14) to have attributive modification of nouns by a verb (14a) and a noun (14b), in violation of the widespread belief that only adjectives attributively modify nouns, constructions like these in the related language Miskitu have been analyzed as internally headed relative clauses (Alpher and Hale n.d.; Green 1992). In this way, the subject DP in (14b), has a syntactic structure something like (15), with a null copula in the third person, just as in matrix nominal and property concept word predication (on which, see the discussion in Chapter 4).

(15)



As Green (1992) points out for Miskitu, there is no reason also not to believe that what look like attributive modification constructions in sentences with property concept words like (13) are not also internally headed relative clauses with the property concept word as the main predicate of the internally headed relative clause, having a structure essentially identical to that in (15), with the property concept word serving as the predicate of the internally headed relative clause. As he points out (Green 1992), the grammar of Miskitu, and Ulwa like it, independently generates such structures, and there is no evidence that would suggest that there is a separate attributive construction independent of internally headed relative clause formation. The absence of such evidence alongside other evidence (a) that Ulwa lacks adjectives and (b) that property concept words suffixed with *–ka* are nouns, suggests that the language does indeed lack attributive modification. Minimally, at least, there is no evidence that the language has it.

Comparative evidence

A final argument for the nominal status of property concept words in Ulwa comes from comparative evidence from Mayangna, Ulwa's closest relative in the small Misumalpan family. A point I have yet to touch on is the fact that the suffix *–ka* that appears on property concept words in Ulwa is phonologically of identical shape to the third person singular possessive suffix in the nominal possessive morphology paradigm, as shown in

(5), and repeated in (16).

(16) Ulwa nominal possessive paradigm (Green 1999:78)

1SING	–ki	1PL.EXCL	–ki-na
2SING	–ma	2PL	–ma-na
3SING	**–ka**	3PL	–ka-na
		1PL.INCL	–ni

It turns out that in Mayangna, it is also the case that there is a suffix appearing on property concept words and that it too has the same phonological shape as the third person singular possessive marker. Interestingly, however, the phonological shape of these markers in Ulwa and Mayangna is completely different—while in Ulwa it is *–ka*, in Mayangna it is *–ni*. This is laid out by the table in (17).

(17) Nominal and property concept word marking in Sumu subfamily of Misumalpan (Norwood 1997; Benedicto and Hale 2000 on Mayangna)

	3sing poss	PC words
Ulwa	–ka	–ka
Mayangna	–ni	–ni

The fact that both languages have a marker on property concept words that is the same as the third person singular possessive marker, but with different phonological shape in the two languages, seems unlikely to be an accident. Although more research is required to understand more fully why this should be the case, the observation that property concept words are nouns in at least the Sumu sub-branch of Misumalpan, if not in Misumalpan more generally, seems a reasonable starting point for a future explanation, especially in light of the fact that the possessive is a nominal category.

6.1.3 Summary

In the preceding sections, I laid out data supporting the claim that Ulwa property concept words have stative senses in the absence of *–ka*. This was shown on the basis of the fact that bare roots can be used as clitic-like property concept denoting elements without being derived into full-fledged syntactic words via *–ka* in a restricted set of syntactic/phonological environments. What the derivational operation marked by *–ka* does, then, is not to derive a state from a COS-denoting root. Instead, its primary function is to derive a free nominal syntactic word from a bound root. I then went on to show on the basis of a number of morphosyntactic diagnostics and observations that property concept words in *–ka* are not adjectives, as they often are in many Indo-European languages, but instead are nouns. Ulwa, for its part, actually seems to lack entirely a class of adjectives; derived property concept words and other nouns fall into a single syntactic class. This observation, in turn, was shown to have larger consequences for the language's morphosyntactic structure. Most importantly in the context of the MH is the fact that *–ka*, contrary to initial appearances, does not seem to mark a derivation that alters the lexical semantics of the roots from which property concept words are derived. Instead, it serves a more purely morphosyntactic function, altering the syntactic category of the roots it suffixes to. In the sections that follow, I consider the consequences of this finding for the nature of the derivational relationship of words naming states and changes of state in Ulwa, in particular with respect to the extent to which the facts of Ulwa conform to the MH.

6.2 The MH and the meaning of roots

Returning to the question of the MH, the finding that a property concept state denotation can arise in the absence of *–ka* has clear implications, but ones which are not immediately clear in light of the analysis of the verb class system laid out in Chapter 5. In that chapter, I showed that the *–ta/pa–* verb class markers do not seem to have any direct impact on the lexical semantics of roots from which they derive verbal stems. In the present chapter, however, I also showed that *–ka* is much like *–ta/pa–* in that it effects a change in syntactic category, but does not alter the lexical semantics of roots to which it suffixes. These observations lead to a somewhat contradictory view of the semantics of roots. In the previous chapter, the evidence suggested that the roots upon which change into property concept state verbs were built had a causative COS meaning. In this chapter, however, I have laid out evidence showing that the suffix *–ka* appearing on property concept words does not alter the lexical semantics of roots, suggesting that the roots upon which property concept words are constructed have simple state meanings. We are left, then, with the seemingly paradoxical view of states and changes of state in (18), where it appears that the bare root at once has a property concept state denotation and a causative COS denotation, given the findings that neither *–ka* nor *–ta/pa–* alter the lexical semantics of roots.

(18) Ulwa states and changes of state in light of findings of Chapters 5 and 6

	adj. state (noun)	non-causative COS	causative COS	
a.	sang–	sang-da–	sang–	green/blue
b.	yûh–	yûh-da–	yûh–	long, tall
c.	baras–	baras-da–	baras–	black
d.	bara–	bara-da–	bara–	dark
e.	sik–	sik-wa–	sik–	large
f.	warin–	warin-da–	warin–	bent

Determining whether or not the derivational relationship of states and changes of state in Ulwa is consistent with the MH depends on identifying the meaning of the root. Does it name a causative change into a state, as the evidence suggested in the previous chapter, or does it name a property concept state as suggested in this chapter? Or, is the root polysemous, having both kinds of meanings lexically specified? Evidence I lay out in the sections that follow suggests that all three of these possibilities hold, but in ways thoroughly consistent with the MH.

I start by reviewing the evidence showing that at least some roots are polysemous. I then turn to the more complicated cases involving derivation of the COS senses from the state-denoting root, and non-derivation of property concept words from COS-denoting roots.

6.2.1 Polysemy

Independent of the question of the MH and the relationship of states to changes of state, it is clear from other kinds of verbal meanings that Ulwa roots are often polysemous.

Consider, for example, the root *wauh–*, which has a relatively wide range of unrelated senses listed in the Ulwa dictionary (Green 1999), as illustrated in (19).

(19) *wauh–*

wauh	noun	'owl'
wauh	noun	'cabbage palm'
wauh-da-naka	intrans. verb	'fall'
wauh-naka (*–pa–* class)	intrans. verb	'waft, float (of odor)'
	trans. verb	'grind with mill'
	trans. verb	'slap'
	trans. verb	'suffer from'
	intrans. verb	'blow (wind)'
	trans. verb	'peddle, sell'

While some of the senses of the root *wauh–* listed above may arguably be synchronically related, e.g. 'blow (wind)' and 'waft, float (of odor)', many clearly are not. For example, it is hard to imagine what the synchronic relationship between an event of selling and a cabbage palm might be. I do not deny that there may be some distant diachronic relationship between these senses. This is, however, a tangential matter in the context of the MH, which makes predictions only about synchronically productive derivational relationships. At least some of these senses, then, will simply have to be lexically listed, so that the root *wauh–* has multiple senses.

The same is true for at least some roots from which words naming states and changes of state are derived. That is, the evidence suggests that both the state sense and the COS sense must be lexically listed as synchronically separate (if diachronically related) senses of the root. The evidence for this comes from the fact that the senses available to *–ka* suffixed property concept words and to COS verbs based on the same root are sometimes disjoint, so that the meaning of the COS verb does not embed the meaning of the property concept word. This is true, for example, for the root *sah–*. As a verb, this root has two kinds of COS senses, as discussed in Chapter 5, an internally caused sense having to do with the hatching of an egg as in (20) and an externally caused sense having to do with cracking events, as illustrated by the transitive *–ta–* verb in (21a) and the intransitive *–wa–* verb in (21b).

(20) Kat-ki-taramah suma-ka aslah watah dai ya **sah**-t-ida.
chicken-1SING egg-3SING one have PAST DEF split-TA-3SING.PAST
'The one egg that my chicken had hatched.' (i.e., a chick emerged from it; notes, 988)

(21) a. Yang pan as ahai-t-ikda ya yan **sah**-t-uting.
1SING log one bring-TA-1SING.PAST the tomorrow split-TA-1SING.FUT
'Tomorrow I am going to split this log that I brought.' (dict.)

b. Kuring-ki tunak **sah**-w-ang ya sau pau-ka
canoe-1SING head crack-WA-3SING.PERF DEF earth red-ADJ
kah-ta-yang.
paint-TA-1SING.PRES
'I am caulking the crack in the prow of my canoe.' (Green 1999:242)

From the root *sah–* not only can verbs be derived, but also *–ka* suffixed property concept words, with several different senses. As illustrated by the data in (22), *sahka* names a state of being forked (22a), the property of disobedience (22b), and naughtiness (22c).

(22) a. Pan **sah**-ka as wal-t-i ya-w-ah.
stick forked-ADJ INDEF look-TA-SS go-WA-2SING.IMP
'Go look for a forked stick.'

b. Baka **sah**-ka ya wal-ta-sing.
child disobedient-ADJ DEF want-TA-1SING.NEG
'I do not want a disobedient child.' (notes, 988)

c. Yal amangisauh balna ya dî **sah**-ka balna ka.
woman prostitute PL DEF thing naughty-ADJ PL SENT.KA
'Prostitutes are very naughty.' (Green 1999:241)

The observation is that the set of senses available to *sah–* when used as a *–ka* suffixed property concept word is disjoint from the set of senses available to *sah–* when used as a verb. While *sahka* has the property concept state senses 'forked, disobedient, naughty', the *–ta–* class verb *sahnaka* and its *–wa–* class counterpart *sahwanaka*, which have COS senses, cannot have the senses '(cause to) become forked, disobedient, naughty.' Similarly, while *sahnaka* has the COS senses 'be born/hatch, to split/crack', *sahka* has no property concept state sense to which these COS senses are (synchronically) related. The senses of *sah–* when used as a *–ka* suffixed property concept word and as a verb are disjoint, as illustrated graphically in (23).

(23) The various senses of *sah–* as a verb and as a *–ka* suffixed property concept word

sahnaka
'be born; hatch (e.g. chickens)'
sah(wa)naka
'split, crack'

sah–

sah-ka
'forked (e.g. stick)'
'disobedient (e.g. children)'
'naughty, disgusting'

The observation, then, is that the property concept state senses and the COS senses of the root *sah–*, while they are almost certainly diachronically related to one another, have no synchronic relationship. Instead, they must be listed as separate senses of the root. The root, then, has both property concept state senses and COS senses, which are not synchronically related to one other.

Uncovering evidence of the kind uncovered for *sah–* that unambiguously argues for a polysemous root requires extremely detailed lexical semantic field research of a kind that requires sustained presence for lengthy periods of time in the field and perhaps is more likely to arise in the context of a participatory documentation project of the kind that has been going on in Karawala since the late 1980s. It is not the kind of thing that one can simply look for; data like the ones discussed above, I believe, to a large degree can only arise organically during the course of other work. It is, thus, not clear presently how many such roots like *sah–* there are with separate lexical entries for property concept state and COS senses. So far as the MH is concerned, however this state of affairs is consistent with it, though vacuously. Since there simply is no derivational relationship between states and changes of state, it is vacuously true that derivational operations only add decompositional operators.

If all roots were like *sah–*, there would be little more to say—the Ulwa situation would have been found consistent with the MH, perhaps in a surprising way, but still consistent, since in such a case, there simply would be no synchronically productive word formation operations relating words naming states to words naming changes of state. There is reason to believe, however, that the situation observed with the root *sah–* may well not be the norm. The key criterion used above for reaching the conclusion that separate senses of the root *sah–* must be posited was the observation that the property concept state and COS senses were not semantically derivable one from the other; regardless of the posited direction of derivation, the meaning of the COS senses of *sah–* is not statable in terms of the meaning of the property concept state senses. For many other roots, however, this is simply not the case—the COS senses *are* statable in terms of the property concept state senses, or at least a subset of them, in a way such that to posit a polysemous root would be to miss a generalization. In cases like these, I believe it makes more sense to assume that there is indeed a derivational relationship between the state and COS senses. If, however, one believed to the contrary that the best analysis were to posit a polysemous root with state and COS senses in the lexicon, this would of course be entirely consistent with the MH. I simply do not believe, however, that this is the best analysis in the context of the facts of the language, or in the context of my own prejudices about the nature of the lexicon. This, then, raises the questions (a) whether the meaning of the root is that of a property concept state or a COS and (b) in light of the answer to (a) whether the derivational operation deriving the other sense from the meaning of the root is consistent with the MH. These are questions I address in the section that follows.

6.2.2 Evidence for a derivational relationship

As hinted at in the previous section, it is not the case that all roots upon which property concept words and COS verbs are built lack a semantic relationship with one another. Indeed, there are many roots from which property concept words and COS verbs are derived that have the meaning of the former embedded in the meaning of the latter. Abstractly speaking, the observation is that the denotation of the property concept word forms part of the denotation of the COS verb, as in (24) for a random nameless state ϕ.

(24)
a. $\lambda x \lambda s[\phi(s, x)]$
b. $\lambda x \lambda s \lambda e[BECOME(e, s, \phi, x)]]$
c. $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, \phi, x)]]$

This kind of relationship holds for the meanings of property concept words and COS verbs of many roots in Ulwa, with the property concept words and COS verbs derived from a small number of these listed in (25).

(25) Property concept (PC) words and associated change into property concept state verbs (with third person singular infinitival morphology *–naka*)

PC word	**gloss**	**COS verb**	**gloss**
auh-ka	fat	auh-naka (*–ta–*)	(cause) become fat
babar-ka	thin	babar-naka (*–pa–*)	become thin
sik-ka	big	sik-(wa)naka (*–wa/pa–*)	(cause) become big
bisi-ka	small	bisi-naka (*–pa–*)	shrink
adah-ka	short	adah-naka (*–pa–*)	(cause) become short
puruh-ka	sunken, deep	puruh-naka (*–ta–*)	(cause) become sunken
tubak-ka	thick/dense	tubak-naka (*–ta–*)	become dense
siu-ka	grown/mature	siu-naka (*–ta–*)	become mature
dut-ka	bad	dut-naka (*–ta–*)	spoil
pau-ka	red	pau-naka (*–ta–*)	(cause) become red
pih-ka	white	pih-naka (*–ta–*)	(cause) become white
baras-ka	black	baras-naka (*–pa–*)	(cause) become black
puput-ka	brown	puput-naka (*–ta–*)	(cause) become brown
lalah-ka	yellow	lalah-naka (*–ta–*)	(cause) become yellow

As pointed out above, it could be the case that roots like the ones from which the words in (25) are derived are simply polysemous, having both state and COS meanings, and no problem would be caused for the MH. Common in studies of the lexicon, however, is the assumption Reinhart (1996) calls Lexicon Uniformity, my own interpretation of which I give in (26).

(26) Lexicon Uniformity (cf. Reinhart 1996:2)
For two forms α and β, if one is formally derivable from the other and the meaning of one makes reference to the meaning of the other, then only one of them is lexically listed.

By the criteria in (26) for lexical listedness, roots like the ones upon which words like those in (25) are built would have only one sense listed, while ones like *sah–* would have both listed. Following this criterion, and also assuming the worst case scenario whereby only one is listed (since polysemy does not violate the MH), I assume in the sections that follow that for roots like the ones in (25), only either the state or the COS sense is lexically listed. In the sections that follow, I lay out several empirical arguments supporting the position that for roots like the ones in (25), it is the stative sense that is listed, while another set of roots have only COS senses listed.

6.2.3 Some roots name property concept states, some name changes of state

Assuming that there is a derivational relationship between property concept state senses and COS senses, in the context of the MH the question is what is the nature of the derivation? Does this derivation add operators like CAUSE and BECOME to derive COS meanings from property concept state meanings, or does it delete operators like CAUSE and BECOME in order to derive property concept state meanings from COS meanings? More concretely, for property concept state and causative change of property concept state meanings like (27a,b), is the meaning of the root (27a) with (27b) derived from it, or vice versa?

(27) a. $\lambda x \lambda s[\phi(s, x)]$
b. $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, \phi, x)]]$

There does, in fact, turn out to be evidence, some already reviewed, that reveals the nature of the meaning of the root. This evidence comes from two sources: (a) the denotation of unsuffixed roots used as bare clitics and (b) the contrast in COS verbs with associated property concepts based on the same root. Both sources of evidence point to the conclusion that the roots upon which property concept words and change into property concept state verbs are built have property concept state rather than change into property concept state denotations. Other roots, however, from which only COS verbs can be derived, have COS denotations, consistent with the MH, since if a root has a COS meaning, the MH precludes any derivation that would delete operators, yielding a property concept state meaning. I discuss these two classes of roots in turn.

The denotation of unsuffixed roots used as bare clitics

Already discussed above in previous sections was the fact that the roots upon which many *–ka* derived property concept words are based can be used as bare unsuffixed clitic-like elements. This fact was illustrated by data like those in (2), repeated in (28).

(28) a. Bikiska muih-kana yam-ka kau wâ-ti ihil-ta-yam kau
child body-3PL good-ADJ when grab-ss lift-TA-2SING.PRES when
kangh balna ka.
heavy PL SENT-KA
'When a child's body is healthy when you grab him/her and lift him/her up they are heavy.'

b. Muih-ma ya **yam** lau man.
body-2SING DEF good sit man
'You're looking good.' (lit: You are sitting with your body well.)

c. Pan as as balna ya **warin** bik lau lau ka.
tree one one PL DEF crooked also sit sit SENT-KA
'There are also some trees that are crooked.' (lit: Some trees also sit crookedly)

d. Wassik bik **tari** lau ka.
river also curvy sit SENT-KA
'There are also rivers that are curvy.' (lit: Rivers too, sit curvily.)

e. Kuring **mukul** **balna** ya tulu-dai dî yabasik-ka.
canoe cylindrical PL DEF roll.over-3SING thing dangerous-ADJ
'When cylindrical canoes roll over, it is a dangerous thing.'

When the roots upon which *–ka* derived property concept words and change into property concept state verbs are built are used as bare clitic-like elements as in the examples in (28), these words have a property concept state denotation, not a change into property concept state denotation. The sentence in (28c), for example, entails that the tree is crooked, perhaps because it grew that way. There is no entailment that the tree has undergone a change into a state of crookedness—it may well always have been that way (cf. the discussion of Tagalog in §3.5.1). That the bare root uses denote property concept states rather than changes into property concept states is also made particularly clear by (28d), in which the only possible understanding for a 'curvy river' is one in which the river has always been that way—it has not undergone a change into a state of curviness. The same is true for the other examples in (28).

That the bare roots can be used without suffixation and with property concept state denotations argues strongly that the roots themselves have a property concept state meaning and not a causative change into property concept state meaning. That is, the denotation of roots like *kangh–* in (28a) is as in (29a), not as in (29b). The meaning in (29b) instead must be derived by some kind of zero derivation, which I discuss further in §6.3.

(29) a. $\lambda x \lambda s[heavy(s, x)]$
b. $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, heavy, x)]]$

Change into property concept state verbs versus *break*-type verbs

Another argument for the stativity of the roots from which *–ka* suffixed property concept words and change into property concept state verbs are derived, comes from a contrast in the behavior of the roots from which other COS verbs are derived. This contrast motivates a distinction in the lexicalization of these roots—while some roots have a COS denotation, the roots from which change into property concept state verbs are derived have a stative denotation. That is, the contrast in behavior motivates a distinction in the lexical semantics of roots, so that while some have a lexical entry like (30a), others have a lexical entry like (30b) (Koontz-Garboden 2006c), where ϕ names a random state.

(30) a. $\lambda x \lambda s[\phi(s, x)]$
b. $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, \phi, x)]]$

As I show in Koontz-Garboden (2006c), Ulwa COS verbs based on property concept states behave in morphosyntactically and semantically different ways from COS verbs in Levin's (1993) *break* and cooking type COS verb classes. One of the differences highlighted is that the roots upon which change into property concept state verbs are built also form *–ka* suffixed property concept state denoting words. This is illustrated by the table in (25), repeated in (31), which lists a sampling of pairs of *–ka* suffixed property concept words alongside verbs naming changes into those states.

(31) Property concept (PC) words and associated change into property concept state verbs

PC word	**gloss**	**COS verb**	**gloss**
auh-ka	fat	auh-naka (*–ta–*)	(cause) become fat
babar-ka	thin	babar-naka (*–pa–*)	become thin
sik-ka	big	sik-(wa)naka (*–wa/pa–*)	(cause) become big
bisi-ka	small	bisi-naka (*–pa–*)	shrink
adah-ka	short	adah-naka (*–pa–*)	(cause) become short
puruh-ka	sunken, deep	puruh-naka (*–ta–*)	(cause) become sunken
tubak-ka	thick/dense	tubak-naka (*–ta–*)	become dense
siu-ka	grown/mature	siu-naka (*–ta–*)	become mature
dut-ka	bad	dut-naka (*–ta–*)	spoil
pau-ka	red	pau-naka (*–ta–*)	(cause) become red
pih-ka	white	pih-naka (*–ta–*)	(cause) become white
baras-ka	black	baras-naka (*–pa*)	(cause) become black
puput-ka	brown	puput-naka (*–ta–*)	(cause) become brown
lalah-ka	yellow	lalah-naka (*–ta–*)	(cause) become yellow

The data in the table in (31) show that in Ulwa, there is a class of roots from which can be derived both *–ka* suffixed words naming property concept states and verbs naming changes into those property concept states. Additionally, as discussed in previous sections, for such roots there also generally exist property concept state denoting uses of the bare unsuffixed root, when the right syntactic/phonological conditions are met.

Contrasting with the situation for the kinds of roots illustrated in (31) is the situation for roots upon which *break* and cooking type COS verbs are constructed. Some verbs falling into these classes are listed in (32) (the intransitive variant being the infinitive form of the verb with the *–wa/da–* suffix, the transitive variant being the infinitive form of the verb without the *–wa/da–*).

(32) Some *break* verbs
bah(wa)naka 'break'; pil(da)naka 'chip'; sah(wa)naka 'crack'; dak(wa)naka 'rip/snap'; sah(wa)naka 'split'; birh(da)naka 'tear, rip, shred'; suih(da)naka 'break, snap off'; turu(da)naka 'flake (skin)'; tak(da)naka 'chip, flake off, peel'; lis(da)naka 'split/cleave'; buk(da)naka 'chip/crack (e.g. lips)'; kalh(da)naka 'crush/break'

(33) Cooking verbs
lah(wa)naka 'boil'; dâ(wa)naka 'burn/bake'

As discussed in Koontz-Garboden (2006c), among the ways in which the *break* and cooking type COS verbs contrast with the change into property concept state verbs is that *–ka* suffixed property concept state words based on the same roots as *break*-type and cooking verbs such as those in (32) and (33) are generally not attested. For example, although there is a verb *lahwanaka* 'boil', there is no associated adjective **lahka* with a stative meaning synchronically related to the COS verb based on the same root. This is similarly the case for *sah(wa)naka* for which there is no related **sahka*, *bah(wa)naka* which lacks a word **bahka* with a related sense, *dâ(wa)naka* and **dâka*, *birh(da)naka* and **birhka*, etc.[3]

The difference in behavior between the roots in (25) and the *break* and cooking type roots in (32) and (33) has consequences for the larger question being addressed, namely the meaning of the roots upon which *–ka* suffixed property concept words are constructed—do these roots have a state meaning, with the change into property concept sense derived or a change into property concept state sense with the state sense derived via a derivational operation that removes operators, contra the MH? The evidence suggests, I believe, that the roots in (25) have a property concept state denotation, as in (34) for the root *pau–* from which *pauka* 'red' and *paunaka* 'redden' are derived.

(34) $\lambda x \lambda s[red(s, x)]$

[3]This is not to say that some of these *–ka* words do not exist at all—some do, but as illustrated by the data in (22) for *sahka*, for example, the meaning of these words is not synchronically related to the meaning of the verbs based on the same root. This contrasts with the situation for verbs based on property concept denoting roots.

The *break* and cooking type roots, by comparison, have a causative COS denotation, as illustrated for the root *birh–* from which *birh(da)naka* 'rip, tear, shred' is derived, but for which there is no related state-denoting word **birhka*.

(35) $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, \textit{not–whole}, x)]]$

Assuming that the meaning of roots from which COS verbs are derived contrast in the way illustrated in (34) and (35), then there is an obvious explanation for the difference in their ability to form *–ka* suffixed words naming property concepts. The roots in (25) form them because they have a property concept state denotation to begin with. The *break* and cooking type roots do not form them because formation of words with such meaning would involve the deletion of operators, in violation of the MH.

Consider, on the other hand, how the difference in behavior between these two classes of roots might be explained if it were instead assumed that the roots in (25) had a COS denotation, like the *break* and cooking type roots, with the *–ka* suffixed property concept words derived via a derivation that deletes operators, in violation of the MH. The lexical rule, however it is to be formalized (not a trivial matter for rules that violate the MH, as discussed in Chapter 2), would effect the change in (36).

(36) $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, \phi, x)]] \longrightarrow \lambda x \lambda s[\phi(s, x)]$

On this analysis, roots have a causative COS denotation and the property concept denotation arises from a derivation that removes operators. A serious problem arises with an analysis like this, however, that does not arise with an analysis with contrasting meaning for the roots that COS verbs are derived from. Specifically, on an analysis like (36) there is no explanation for why the roots in (25) can form *–ka* suffixed property concept words, in violation of the MH, while the *break* and cooking type roots in (35) and (36) cannot. Since all of the roots have causative COS lexical entries on such an analysis, they will all meet the structural description of the lexical rule deriving property concept states from changes of state. The question that arises on such an analysis, then, is why it is that only a subset of the roots have property concept words derived from them, while others do not.

On the alternative analysis that I have proposed that is instead consistent with the MH, there is a contrast in the lexical meaning of the roots on which the *break* verbs and the property concept verbs are built. This analysis, by contrast, explains why it is that these roots display contrasting behavior in their ability to form property concept denoting words. The contrast follows from the MH. For roots with a property concept state meaning, they can always be augmented to a COS meaning, since the MH allows this. For roots with a causative COS meaning, however, they cannot be stripped of their CAUSE and BECOME, because this violates the MH. The facts discussed in this section then, like those discussed in the previous section, point strongly to the conclusion that the roots upon which *–ka* suffixed property concept words are formed are state-denoting, not COS-denoting. The roots that *break* and cooking type verbs are derived from, in contrast, are COS denoting. The MH, in turn, constrains the possible meanings these roots can have, given their basic lexicalization.

6.3 The derivation of causative COS verbs

In the preceding discussion, I laid out evidence showing that the meaning of roots upon which *–ka* suffixed property concept words are derived is that of a state, not a COS. What remains to be seen is how a causative COS denoting verb is derived from this state-denoting root. Without going into great detail, I offer some preliminary thoughts in this section.

First, recall the functions that *–da/wa–* and *–ta/pa–* were observed in Chapter 5 to have in the context of the Ulwa system of verbal morphology. While *–da/wa–* were shown to have functions of anticausativization in the context of their broader function as markers of the middle voice, *–ta/pa–* were shown to have no consistent impact on the LCS of roots to which they suffix, simply deriving a verbal stem from a root. What then is the role of *–ta/pa–* in the derivation of COS meaning from these roots?

This question might be restated as follows: given the stative meanings of the roots upon which property concept words are based and the fact that *–ta/pa–* derive verbs from precategorial roots, what would the meaning of the *–ta/pa–* derived stem be expected to be, if deriving a verbal stem from a property concept state denoting root? Given the fact that these roots already form state-denoting words (as both bare roots and *–ka* suffixed words), both blocking (Kiparsky 1982) and the principle of contrast (Clark 1993) would have it that the *–ta/pa–* derived verb should have a meaning other than the stative meaning. Thus, although the root may have a stative meaning, a stative denotation of the *–ta/pa–* derived verb will be blocked by the existence of the other state-denoting words (the bare root and the *–ka* suffixed words). The question remains, then, assuming that *–ta/pa–* suffixation to property concept denoting roots is well formed (as it is), then what kind of meaning will the result of suffixation have if it cannot have a property concept state meaning? One possibility would be to augment the meaning of the root by addition of decompositional operators, consistent with the MH. This appears to be what happens; COS meaning with property concept denoting roots is generated indirectly as a result of blocking. Because there are already words naming property concept states, the derivation of a verb based on such roots cannot also be state-denoting. As a result, consistent with the MH, operators are added to the lexical semantic representation to derive a new meaning, a COS meaning.

In this way, then, I reconcile the apparently contradictory observations that the roots upon which property concept state denoting words are built are state-denoting and that *–ta/pa–* do not alter the meanings of roots. Both of these propositions are true; the way in which COS meaning is generated in *–ta/pa–* stems built on property concept denoting roots is indirect, arising as a result of interaction with blocking.

6.4 Summary and concluding remarks

This chapter continued the discussion of states and changes of state in Ulwa in the context of the Monotonicity Hypothesis, further examining the extent to which the derived property concept words in the language violate the MH, a conclusion suggested by the discussion of Ulwa verb classes in Chapter 5, which suggested that property concept words in Ulwa are derived from causative COS denoting roots. I showed, contrary to initial appearances, that the derivational operation deriving morphologically complex property concept words from bare roots in Ulwa is not an operation that impacts the lexical semantics of the root. Instead, this derivation effects a change in lexical category, deriving a property concept denoting noun from a bound root, a conclusion supporting by a number of facts about the morphosyntax of the language. The finding that the derivational operation deriving property concept words from roots does not alter the lexical semantics of the root led to a paradox in light of the findings of Chapter 5 that the suffixes deriving causative COS verbs from roots also do not alter the lexical semantics of the root. Both findings lead to the conclusion that the denotation of roots is at once that of a property concept state and that of a causative COS. I then showed that in fact, there are indeed some roots that are polysemous, having both kinds of denotations. Another class of roots, for their part, is lexicalized with property concept state meaning. Yet another class is lexicalized with causative COS denotations. It is only from those roots that are lexicalized with property concept state denotations that property concept words can be derived. Roots with causative COS denotations, like those from which *break* and cooking type verbs are derived, do not allow the derivation of property concept state words. This is exactly what the MH predicts, since the derivation of a property concept state from a causative COS would involve the deletion of operators.

This chapter concludes, then, the investigation of Ulwa as a potential counterexample to the otherwise robust prediction of the MH that words naming property concept states are never derived from words naming changes into those states. Though initially appearing as a counterexample to this prediction, especially in light of the facts of the Ulwa verb class system laid out in Chapter 5, further investigation has shown the Ulwa facts to actually conform with the predictions of the MH. More broadly, with the Ulwa facts observed to actually be in compliance with the strong prediction of the MH, at least barring the appearance of further potential counterexamples, it appears safe to conclude that this strong prediction of the MH is indeed borne out—words naming property concept states are not derived from words naming changes into those states. This fact follows if the MH holds as a strong constraint on the semantics of word formation.

In the next part, Part III, I address another potential counterexample to the MH—anticausativization, a phenomenon observed not only in Ulwa, but in the Romance and other language families. It too, I show, rather than providing counterevidence to the MH, actually provides evidence in support of the hypothesis.

Part III

Changes of state

Chapter 7

Causatives, inchoatives, and the MH

7.1 The prediction and the facts

In Chapter 2 I laid out several predictions of the Monotonicity Hypothesis concerning the derivational relationships among words naming states and words naming changes into those states. The predictions, first given in Chapter 2, are repeated in (1).

(1) Predictions of the MH about the derivational relationship of states and changes of state

a. Words naming states are never derived from words naming non-causative or causative COS events.
b. Words naming non-causative COS events could be derived from words naming states.
c. Words naming non-causative COS events are never derived from words naming causative COS events.
d. Words naming causative COS events could be derived from words naming states or from words naming non-causative COS events.

My focus has been the investigation of the strongest predictions of the MH in this empirical domain, namely (1a) and (1c). In Chapter 3 I clarified certain aspects of the relevant notion of stativity for the prediction in (1a) and went on to survey data from a number of languages in order to evaluate the prediction. With one exception, Ulwa, the data seemed to bear out the prediction. In Chapters 4, 5, and 6, I then went on to investigate the facts of Ulwa in detail, showing that despite initial appearances, words naming states are not derived from words naming changes of state. In this way, then, the crosslinguistic and language particular facts have been shown to strongly support the prediction of the MH in (1a).

In this chapter and in the one that follows, I turn to the second strong prediction of the MH in the domain of states and changes of state, the prediction in (1c) that words naming non-causative changes of state are not derived from words naming causative changes of state. That is, the prediction is that if there is a derivational relationship between words with denotations like those in (2a,b), then it can only be in the direction of (2b) being derived from (2a), not vice versa.

(2) a. $\lambda x \lambda s \lambda e[BECOME(e, s, \phi, x)]$
b. $\lambda x \lambda y \lambda s \lambda e[\exists e'[CAUSE(e', y, e) \wedge BECOME(e, s, \phi, x)]]$

The reasoning behind this prediction is simple—the MH states that derivational operations can add, but cannot remove decompositional operators. While the derivation of a word with causative COS meaning like (2b) from a word with non-causative COS meaning like (2a) can be accomplished via the addition of a CAUSE operator, a derivation in the reverse direction could be accomplished only by deletion of such an operator, in violation of the MH.

It turns out that for many pairs of verbs in many languages, there is a derivational operation deriving words naming causative COS events from words naming non-causative COS events, a derivational operation consistent with the predictions of the MH. This is illustrated by the data from Quechua in (3), Tongan in (4), and Pima in (5).

(3) Quechua

a. **hatun-ya**-y
big-INCH-INF
'become big' (Cusihuaman 1976:195)

b. Wasi-ta **hatun-ya-chi**-rqa-n.
house-ACC big-INCH-CAUS-PAST-3P
'(S)he made the house big.' (Martina Faller, p.c.)

(4) Tongan (Koontz-Garboden 2005)

a. Hili pe 'uluaki fo'i'akau´, kuo **lahi** ia.
after only first medicine, INCH big him
'After only one pill, he became big.'

b. Na'e **faka-lahi** e he puleanga 'a e hala.
PAST faka-wide ERG the government ABS the road
'The government widened the road.'

(5) Pima (Smith 2005)

a. Hoogi 'a-t **moika**.
leather AUX-PRF soften
'The leather became soft.'

b. Hoogi 'a-ñ **moika-jid**.
leather AUX-1s soften-TRANS
'I'm softening the leather.'

This direction of derivation, causativization, is exactly the kind of word-formation operation predicted by the MH, since it results in the addition of a decompositional operator to the lexical semantic representation of the derived lexeme as compared to that of the lexeme from which it is derived.

For other pairs of verbs, however, in many (and often in the same) languages, the reverse direction of derivation is observed (Nedjalkov 1969; Croft 1990; Haspelmath 1993; Nichols *et al.* 2004), i.e., the anticausative direction of derivation predicted by the MH not to exist. This is illustrated for Quechua in (6), Spanish in (7), O'odham in (8), and Italian in (9).

(6) Quechua (Martina Faller, p.c.)

a. tela **qhasu-ku**-n.
cloth tear-REFL.-3P
'The shirt tore/got torn.'

b. tela-ta **qhasu**-sha-n.
cloth-ACC tear-PROG-3P
'She/he tore the shirt./She tears/is tearing the cloth.'

(7) Spanish

a. El vaso **se** **quebr-ó**.
DEF cup REFL break-3SING.PAST
'The cup broke.'

b. Juan **quebr-ó** el vaso.
Juan break-3SING.PAST DEF cup
'Juan broke the cup.'

(8) O'odham (Hale and Keyser 1998:97)

a. Ñ-nowï 'at **'e-mul**.
1s-arm AUX3 REFL-break.PRF
'My arm broke.'

b. Kawyu 'at **mul** g ñ-nowï.
horse AUX3 break.PRF ART 1s-arm
'The hose broke my arm.'

(9) Italian (Centineo 1995:54)

a. La finestra **si** è **aperta**.
the window REFL is opened
'The window opened.'

b. Maria ha **aperto** la finestra.
Maria has opened the window
'Maria opened the window.'

What all of the alternations in (6)–(9) have in common is that the verb naming a non-causative change into a state appears to be derived from a verb naming a causative change into a state. The data in (9) show that for opening events in Italian (and Romance more generally, e.g., (7)), while the word naming the causative COS is morphologically simple (9b), the word naming the non-causative COS in (9a) is derived from the latter with the clitic *si*, used elsewhere in the language as a reflexive pronominal clitic. Given the standard lexical semantic representations of non-causative and causative changes of state in (2), this is a derivational operation that appears to remove a CAUSE operator from the lexical semantic representation of the lexeme it operates on. Were this an idiosyncratic type of derivation unique to a single language, it might be easy to ignore. Anticausativization, however, is well attested crosslinguistically, being particularly common for causative-inchoative pairs naming particular kinds of eventualities. In fact, Haspelmath (1993:104) shows that for breaking, closing, and splitting events, the majority of the languages he surveys actually have the anticausative direction of derivation in relating words naming causative variants of these events to words naming non-causative variants of these events. This kind of relationship between words naming causative and non-causative changes of state, then, for at least certain kinds of events, is far from marginal, and poses a serious challenge to the MH, since it would appear that the function of the derivation is to delete the CAUSE operator from the lexical semantic representation of the causative verb to derive the lexical semantic representation of the inchoative, a kind of derivation entirely inconsistent with the MH.

In fact, what I show in Chapter 8, on the basis of my own analysis and several previous detailed discussions of the phenomenon, is that the representation given in (2a) while perhaps an accurate lexical semantic representation for some intransitive COS verbs, is not an accurate representation for intransitive COS verbs derived from their transitive/causative counterparts via an anticausativization operation. Instead, there are a number of empirical arguments pointing to the conclusion that derived inchoatives actually do have a CAUSE operator as part of their denotation. Anticausativization, rather than removing a CAUSE operator, instead is responsible for performing a different kind of operation on the semantic representation of the lexeme it operates on. Although there are several ways of approaching the issue that are consistent with the MH, I argue that when the full range of relevant facts is considered independent of the MH, they point overwhelmingly to an analysis of anticausativization as a kind of reflexivization operation. Building on Chierchia (2004), I develop the formal details of just such an analysis in Chapter 8, showing how it accounts for the full range of facts of anticausativization that no other analysis comes close to capturing. On empirical grounds alone, I show that anticausativization as reflexivization is by far the best analysis of anticausativization. Independent of these empirical considerations, it also happens that this analysis is entirely consistent with the MH, as it involves no deletion of decompositional operators. The conclusion, then, is that far from being counterevidence to the MH, the facts of anticausativization, perhaps a misnomer for the phenomenon in the end, actually offer strong support for the hypothesis.

Before turning to the proposed analysis of anticausativization as reflexivization in Chapter 8, I first lay out in this chapter some of the most basic facts of the phenomenon that I believe any serious analysis must be able to account for. I then go on to discuss previous analyses of anticausativization in light of these benchmarks and the MH.

7.2 Benchmarks for an analysis of anticausativization

7.2.1 Anticausative and passive

Before delving into detailed discussion of the anticausative and its implications for the MH, in this section I make clear what the anticausative is in the first place, at least, that is, when compared to the passive. At the same time, the facts discussed in this section are ones that any analysis of anticausativization comes up against and must have some explanation for.

The question of what exactly the anticausative operation is actually turns out to be a somewhat vexed question that I believe has been underappreciated in much of the literature. The problem is that functions that are descriptively known as anticausative, passive, and reflexive often receive identical morphosyntactic encoding on the verb in language after language. This fact is illustrated by the table from Haspelmath (1990:36) in (10), which shows syncretisms across these, and other, functions in a number of genetically diverse languages.[1]

(10) Other uses of anticausativizing morphology (Haspelmath 1990:36)

	reflexive	anticausative	passive	potential passive	fientive
Tigre	x	x	x		
Motu	(x)	x	x		
O'odham	x	x	x		
Mod. Greek	x	x	x	x	
Kanuri	x	x	x	x	
Margi	x	x	x	x	
Uigur		x	x	?x	?(x)
Udmurt	x	x	x		
Nimboran		x	x		x
Danish (*–s*)		x	x	x	
Latin (*r*)	x	x	x		(x)
Latin (*esse*)	x	x	x		
Mwera (*–k*)		x		x	x

Both passive and anticausative are valence changing operations that are responsible for making the internal argument of a transitive verb into the external argument of a derived intransitive verb. How, then, are they distinguished from one another? Some have expressed skepticism that there are any solid morphosyntactic diagnostics that can distinguish the two (Keenan 1985:254). I am more optimistic—although it is tricky, and the number of diagnostics does not appear to be overwhelming, there do seem to be morphosyntactic and semantic diagnostics that can distinguish passive from anticausative. I illustrate this on the basis of data from Spanish, a language which shows the kind of syncretism that has led to the kind of skepticism expressed by people like Keenan.

Before proceeding, I must first point out that Spanish, among the languages I will draw upon most in the discussion of anticausativization in this chapter, has two kinds of

[1]Haspelmath's "potential passives" are passives in which "... the subject is capable of undergoing an action" (Haspelmath 1990:33), for example the contrast between 'to lift' and 'to be liftable.' The "fientive" "... derives a process of becoming from stative expressions, especially adjectives" (Haspelmath 1990:34). See Haspelmath (1990:33-34) for further discussion of these various classes.

passive construction corresponding to the morphologically unmarked causative verb in (11a)—one with an auxiliary (11b) and one without (12).

(11) a. El capitán hundió el barco.
the captain sank the ship
'The captain sank the ship.'
b. El barco fue hundido.
the boat was sunk
'The boat was sunk.'

(12) El barco se hundió.
the ship REFL sank
a. 'The ship was sunk.'
b. 'The ship sank.'
c. 'The ship sank itself.'

Although the passive with auxiliary in (11b) has only a passive interpretation, the *se* passive in (12) has multiple interpretations. As illustrated by the three glosses, (12) can have not only a passive interpretation (12a), but also an interpretation as an inchoative (12b), and even as a reflexive, if the boat is anthropomorphized (12c). Not all verbs and not all morphosyntactic environments are consistent with all of these interpretations, however. It is from this fact that we can conclude that these interpretations are distinct from one another, that the passive with *se* verbs and the anticausative with *se* verbs are distinct (if related) functions of the *se* derived verb.

Perhaps the clearest, and only solid non-semantic, morphosyntactic diagnostic that can distinguish passives from anticausatives is the ability to be modified by a reflexive adjunct (cf. Siewierska 1984:79; Chierchia 2004:43), as illustrated in (13) for Spanish by the reflexive adjunct *por sí solo* 'by it/him/herself'.

(13) a. *El barco fue hundido *por sí solo*.
the boat was sunk by self only
'*The boat was sunk by itself.'

b. El barco se hundió *por sí solo*.
the boat REFL sank by self only
'The boat sank by itself.' (Mendikoetxea 1999b:1594)

The observation is that passives with an auxiliary cannot cooccur with the adjunct *por sí solo* 'by itself', while *se* marked intransitive verbs can. The conclusion, then is that the function of the *se* marked verb in such a context, as in e.g., (13b), must be something other than passive. And indeed, a sentence like (13b), while it can have an inchoative interpretation, it cannot have a passive interpretation.

Using this diagnostic, it can be shown that there are a number of verbs in Spanish that disallow anticausativization, as is almost always the case for this operation crosslinguistically, as observed e.g., by Marantz (1984:182). Despite the fact that they allow intransitive *se* marked verbs, these uses are passive, not anticausative, since the *se* marked verbs of this kind are judged unacceptable with the adjunct *por sí solo* 'by itself'. This is illustrated by the data in (14).

(14) a. El año pasado se construyó un puente sobre el río Guadalix.
the year past REFL constructed a bridge top the river Guadalix.
'Last year a bridge was constructed over the Guadalix River.'

b. #El puente se construyó (por sí solo).
the bridge REFL constructed by self only
'*The bridge constructed by itself.' (Mendikoetxea 1999a:1655)

According to Mendikoetxea (1999a:1655), the pattern illustrated in (14) holds for many other verbs in Spanish, among them *comprar* 'buy', *vender* 'sell', *lavar* 'wash', *pintar* 'paint', *limpiar* 'clean', *comer* 'eat'.[2] Similarly Mendikoetxea (1999b:1592) reports that although causative verbs typically allow anticausativization, causative verbs that are lexically specified to have an agentive causer do not allow anticausativization, as shown by the unacceptability of the *se* marked intransitives in (15b) and (16b) which

[2]Although she doesn't say so, I believe that (14b) could have a reflexive interpretation, if indeed bridges were such that they could build themselves. It is an accident of the real world that things are not this way.

appear in the context of *por sí solo* 'by itself', forcing the anticausative interpretation (rather than the passive interpretation, available for such verbs, as shown in fn. 3).

(15) a. Los terroristas asesinaron al senador.
the terrorists assassinated the senator
'The terrorists assassinated the senator.' (Mendikoetxea 1999b:1592)
b. *El senador se asesinó (por sí solo).
the senator REFL assassinated by self only
'* The senator assassinated by herself.' (Mendikoetxea 1999b:1592)
c. El senador fue asesinado.
the senator was assassinated
'The senator was assassinated.'

(16) a. El panadero cortó el pan.
the baker cut the bread
'The baker cut the bread.' (Mendikoetxea 1999b:1592)
b. *El pan se cortó (por sí solo).
the bread REFL cut by self only
'*The bread cut by itself.' (Mendikoetxea 1999b:1592)
c. El pan fue cortado.
the bread was cut
'The bread was cut.'

The sentences in (15b) and (16b) are unacceptable when continued by *por sí solo* 'by itself', though they can have reflexive interpretations (Mendikoetxea 1999b:1591).[3] This

[3] Although Mendikoetxea (1999) doesn't mention it, the sentences in (15b) and (16b) seem also to be acceptable with passive interpretations as well, as evidenced by the naturally occurring examples in (i).

(i) a. ... he llegado a visitar pueblos donde no se asesinó a ningún derechista ...
have come to visit villages where no REFL assassinated to none right-winger
'... I have managed to visit villages in which not one right winger was assassinated.' (Google)
b. ... no fue una gran noticia como cuando se cortó la luz en Nueva York ...
no was a big news as when REFL cut the power in New York
'... it wasn't big news like it was when the power was cut in New York ...' (Google)

shows that anticausativization, for reasons I explain in §8.3.1, is not sanctioned with such verbs.

Aside from the morphosyntactic *por sí solo* 'by itself' diagnostic, there is also a semantic diagnostic.[4] This is the fact that anticausatives have non-agent inferences, while passives do not. This contrast is illustrated by the data in (17)–(19) below, which show that at least in part as a result of this semantic contrast, passives can have agentive modifiers (17)–(18), while anticausatives cannot (19) (Roeper 1987).

(17) Se hundió el barco intencionadamente / para cobrar el seguro.
REFL sank the boat intentionally / to collect the insurance
'The boat was sunk intentionally / to collect the insurance.' (Mendikoetxea 1999b:1587)

(18) a. La puerta fue abierta intencionadamente.
the door was opened intentionally
'The door was opened intentionally.'

b. La puerta fue abierta para airear la habitación.
the door was opened to air the room
'The door was opened to air out the room.' (Mendikoetxea 1999b:1592)

(19) a. *La puerta se abrió intencionadamente por sí sola.
the door REFL opened intentionally by self only
'?The door intentionally opened by itself.'

b. *La puerta se abrió por sí sola para airear la habitación.
the door REFL opened by self only to air the room
'?The door opened by itself to air out the room.' (Mendikoetxea 1999b: 1592)

Passives, whether with a reflexive clitic as in (17) or the auxiliary construction as in (18) can take agent oriented adverbial modifiers. In this way, they contrast with

The important point in the present context, however, is that they disallow continuation by *por sí mismo*, a fact which argues for their disallowing anticausativization.

[4] It has been claimed by some that this is the only diagnostic that can distinguish passives from anticausatives (Keenan 1985:254).

anticausatives, which cannot, as illustrated by the data in (19). That the *se* marked intransitives in (19) are used as anticausatives rather than passives is guaranteed by their appearance with the *por sí solo* 'by itself' modifier. Thus, while *se* marked verbs in their guise as passives can have agent inferences, as in (17), *se* marked verbs in their guise as anticausatives cannot, as shown in (19).

What I have shown in this section is that even in languages in which anticausative and passive are morphologically encoded in an identical manner, which happens in the overwhelming majority of languages that have these operations (see the table in (10)), they are still distinct. Contrasts like these between anticausative (and inchoatives more generally, whether derived or not) and passive have been some of the main focal points in research on anticausativization and passivization over the last twenty years (Roeper 1987; Grimshaw 1990; Levin and Rappaport Hovav 1995; Chierchia 2004). As such, any analysis of anticausativization must include an explanation of how anticausative and passive differ such that empirical contrasts like those observed above are expected.

7.2.2 Morphology

On the morphological side, the most obvious empirical fact about anticausativization is that *the word naming the non-causative COS event is morphologically marked vis à vis the word naming the causative COS event*, suggesting that the former is derived from the latter. Indeed, this fact is enshrined in the very name of the phenomenon—*anticausativization*. If one looked at just a single language, one might reach the conclusion that this markedness asymmetry were simply accidental. One might conclude, for example, that it was simply the case that both causative *and* inchoative were marked, but just that the causative was marked by a zero morpheme. In such a case, then, both would be derived from a more abstract root (see §2.5.2 and §7.3.3 for further discussion). The studies of Nedjalkov and Silnitsky (1973), Croft (1990), and Haspelmath (1993), however, argue against such a position, at least in the general case. These studies show that for verbs naming particular kinds of COS events (e.g., events of breaking, splitting, etc.), anticausativization is the predominant direction of derivation crosslinguistically when the words naming non-causative and causative COS share a common root.

In any particular language zero-derivation is generally viewed as a morpheme simply accidentally lacking a phonological spellout. Given the fact that with e.g., *break*-type events, it is extremely common crosslinguistically for the causative to be unmarked vis à vis the inchoative, it seems implausible, in the absence of compelling evidence to the contrary, to assume a zero morpheme for the causative alongside the overt morphological mark appearing on the inchoative. To assume otherwise begs the question why the causative morpheme crosslinguistically with *break*-type verbs should so often lack a phonological spellout. As already discussed at some length in §2.5.2 this issue is entirely independent of the issue of the MH; there is nothing about zero morphology that is inconsistent with the MH, as the MH is a hypothesis about the semantics of word formation, not about morphology. The observation I make here is simply an analytical one, one which I believe most people would share—where a clear pattern is observed, one should seek an explanation for it. Positing wide-spread zero morphology does not explain why the inchoative would be marked relative to the causative; indeed, it seems as unlikely that causativization would be marked phonologically the same way crosslinguistically (i.e., with a zero morpheme) as it does that the concept *dog* would receive the same phonological shape crosslinguistically. Thus, I set as a minimum benchmark for any analysis of anticausativization that it have an explanation for why it is that inchoative is morphologically marked vis à vis causative in cases of anticausativization. As will be shown below, not all analyses of anticausativization in the literature meet this criterion.

7.2.3 Synchrony, diachrony, reflexive and anticausative

Moving beyond the bare morphological minimum discussed in the previous section, ideally an analysis of anticausativization will have something to say not only about the markedness asymmetry in anticausative marking, but about the nature of the morpheme marking anticausativization.

As can be discerned from examination of the table in (10) from Haspelmath (1990:36), anticausativization is with non-trivial frequency marked by a morpheme that serves elsewhere in the language to mark reflexivity. This is further illustrated by the data in

(20)–(27) from Haspelmath (1987:24-25), which show for various genetically diverse languages that a single morphological marker can be used for both anticausative, as in the (a) examples in (20)–(27), and reflexive, as in the (b) examples in (20)–(27).

(20) Polish (Haspelmath 1987:24)

a. palić/palić sie ‘burn(tr.)/burn(intr.)’

b. golić (sie) ‘shave (oneself)’

(21) Hungarian (Haspelmath 1987:25)

a. emel/emelkedik ‘raise/rise’

b. fésül/fésülkodik ‘com/comb (oneself)’

(22) Uzbek (Haspelmath 1987:25)

a. jaxšila-moq/jaxšila-n-moq ‘ameliorate(tr.)/ameliorate(intr.)’

b. kij-moq/kij-in-moq ‘dress/dress (oneself)’

(23) Georgian (Haspelmath 1987:25)

a. xarš-avs/i-xarš-eba ‘cooks(tr.)/cooks(intr.)’

b. k’azm-avs/i-k’azm-eba ‘decorates/decorates her/himself’

(24) Ponapean (Regh 1981 in Haspelmath 1987:25)

a. amwir/emwir-ek ‘crumple(tr.)/crumple(intr.)’

b. apwin/epwin-ek ‘wash the face/wash one’s face’

(25) Arabic (Haspelmath 1987:25)

a. Bayyana/ta-bayyana ‘make clear/become clear’

b. labbasa/ta-labbasa ‘dress/dress (oneself)’

(26) Quechua (Cole 1982 in Haspelmath 1987:25)

a. paska–/paska-ri– ‘open(tr.)/open(intr.)’

b. riku–/riku-ri– ‘see/see oneself’

(27) Nivkh (Haspelmath 1987:25)

a. (j)yld’/ph-yld’ ‘open(tr.)/open(intr.)’

b. vetaud'/ph-fetaud' 'dress/dress (oneself)'

The observation, then, is that it is extremely common crosslinguistically for the same morpheme to mark both reflexivization and anticausativization functions. A comprehensive analysis of anticausativization, I believe, should have some explanation for this fact.

Moving beyond the synchronic morphological and semantic fact observed in the previous paragraph, Haspelmath's (1987, 1990) broader observation is a diachronic one, that reflexive markers are a common diachronic source for anticausative markers. This too is something that I believe a comprehensive analysis of anticausativization should shed light on. Like Deo (2006), I believe that a solid synchronic formal semantic analysis should be responsible not only to the synchronic facts, but to the diachronic ones as well. Specifically, in cases where it is known that a particular semantic function is commonly derived from another via a seemingly unavoidable process of grammaticalization, as in the case of reflexive and anticausative as shown by Haspelmath (1987, 1990), the diachronic analysis and the synchronic analysis should fit together in a straightforward and, ideally, enlightening way that makes sense on the basis of what is known about both synchronic and diachronic semantic processes.

7.2.4 Alternating and non-alternating verbs

Any analysis of the causative-inchoative alternation, regardless of direction of derivation between the verbs naming the causative and non-causative COS events (i.e., causativization or anticausativization) must account for the fact that not all COS verbs participate in the alternation. In any language there can be found inchoatives lacking causative variants (28) and causatives lacking inchoative variants (29).[5]

[5]The facts of inchoatives lacking causative variants are more complicated than I am here characterizing them. McKoon and Macfarland (2000, 2002) and Wright (2001, 2002) in particular show that many inchoatives presumed by Levin and Rappaport Hovav (1995) to lack causative variants do indeed have causative variants so long as the causer is non-agentive. Mendikoetxea (1999b:1600) shows the same for certain Spanish intransitive COS verbs. I gloss over these complications for expository purposes—regardless of these complications, the fact remains that an explanation is needed for why certain intransitive COS verbs lack causative variants of the kind found elsewhere in the language, e.g. for *break*-type verbs.

(28) a. The flowers bloomed.
b. ?Kim bloomed the flowers.

(29) a. Kim cut the cloth.
b. *The cloth cut.

The same kind of non-alternation is found in languages with anticausativization, e.g. Spanish, which also has inchoative verbs lacking causative variants (30) and causative verbs lacking inchoative variants (31).

(30) a. El rosal floreció.
the rose bush bloomed
'The rose bush bloomed.'
b. *El jardinero / La primavera / El abono floreció el rosal.
the gardener / the spring / the fertilizer bloomed the rose bush
'*The gardener / the spring / the fertilizer bloomed the rose bush.'
(Mendikoetxea 1999b:1598)

(31) a. Los terroristas asesinaron al senador.
the terrorists assassinated the senator
'The terrorists assassinated the senator.'
b. *El senador se asesinó (por sí solo).
the senator REFL assassinated by self only
'* The senator assassinated by herself.' (Mendikoetxea 1999b:1592)

Accounting for facts like these has been part and parcel of what it means to give an analysis of causative-inchoative alternations at least since Fillmore (1970) and Smith (1970). I consider that any adequate analysis of causative-inchoative alternations, of which anticausativization is one variety, must incorporate explanations for non-alternation of these kinds.

7.2.5 Inferential relationship between causative and inchoative

Since at least Lakoff (1965:98), one of the goals of analyses of the causative-inchoative alternation has been to capture the systematic relationship between the meaning of causative and inchoative, in particular the fact that the meaning of the inchoative is somehow part of the meaning of the causative. More specifically, it seems to be the case that causatives are paraphrasable as "cause to V-inchoative." For example, while (32a) is generally judged odd out of context (though see §8.3.5), it is easy to conjure up contexts in which (32b) might be uttered, e.g., a child denying culpability for breaking something.

(32) a. ? Kim broke the vase. The vase didn't break.
b. Kim didn't break the vase; it broke.

These are such basic facts of the causative-inchoative alternation, that they often are just taken for granted and left undiscussed in analyses of the alternation, with the way that an analysis actually accounts for them similarly left implicit. Any analysis must have something to say about them, though as I show in §8.3.5, the facts as represented above, are rather idealized.

7.2.6 The spontaneity inference of the inchoative

Among the most common observations about the semantics of the causative-inchoative alternation is that in contrast with the causative, the inchoative variant "... presents the situation as occurring spontaneously ..." (Haspelmath 1993:90) or gives rise to the inference that the event named by it occurred "... without [the intervention of] an external agent" (Smith 1970:102). That is, in contrast with (33a) in English and (34a) in Spanish, which clearly have the meaning that the change in the state of the glass was caused by some force external to the undergoer of the COS event, the inchoative counterparts in (33b) and (34b) give a sense that the breaking of the glass was somehow spontaneous or that there was at least no agent involved in the breaking of the glass.

(33) a. Kim broke the glass.

b. The glass broke.

(34) a. Kim rompió el vaso.
Kim broke the glass
'Kim broke the glass.'
b. El vaso se rompió.
the glass REFL broke
'The glass broke.'

A comprehensive analysis of the causative-inchoative alternation, whether for languages with anticausativization or causativization, must have something to say about this intuition.

7.2.7 Formalizability

I believe there is much to be gained from formal analysis and that a solid analysis must be formalizable. Only then can its predictions and central claims clearly be seen.[6] Further, it should be formalizable in a non-controversial manner, or if not, at least offer justification of the additional formal claims required to make the analysis work. This is not to say that a formal analysis is *ipso facto* better than one that is not formalized. Instead, I believe that with analyses that are not formalized and for which it is not entirely clear how they might be formalized, or for which central, uncontroversial tenants of formal analysis are contradicted, suspicion is warranted. I believe that these are relatively uncontroversial views on analysis standard in the formal semantic and generative grammar literatures. As I discuss below, however, not all analyses of anticausativization proposed in previous literature meet this criterion.

[6] For a recent particularly illustrative example of the attributes of formalization in syntactic theory see Asudeh and Toivonen (2006).

7.3 Analyses of anticausativization

The most common analysis of the causative-inchoative alternation, dating at least to Lakoff (1965), has the causative derived from the inchoative via some kind of causativization process. This process, among other things, results in the addition of a CAUSE operator to the lexical semantic representation of the lexeme from which the causative variant is derived. As noted above, there are many languages in which the alternation is indeed accomplished in this way. In contrast to causativization which has received a great deal of attention in the lexical and formal semantic literature (Lakoff 1965; Dowty 1979; Foley and Van Valin 1984; Pinker 1989; Jackendoff 1990; Hale and Keyser 2002; Doron 2003; Baker 2003; Embick 2004), much less attention has been paid to the facts of anticausativization and how the semantics of this word formation operation might be analyzed, the crucial question at issue in this dissertation given my assertion of the MH. Despite this asymmetry in attention paid to causativization as opposed to anticausativization, the latter is not without analysis. In this section, I review the different kinds of analysis presently found in the literature, discussing at the same time the kinds of facts that they best capture as well as the extent to which the proposed analysis is consistent with the MH.

7.3.1 Denial

One approach to anticausativization is to simply deny that it exists at all as a productive word formation operation. This is the claim of Marantz (1984:181ff.) who argues that COS-denoting lexemes are systematically ambiguous between causative COS and non-causative COS senses in the lexicon. Any semblance of productivity that there might be in anticausativization, according to Marantz, is accomplished via analogy. The idea seems to be that although both non-causative and causative COS senses exist in the lexicon, there is at the same time some kind of lexical redundancy rule (Jackendoff 1975) capturing the relationship between these senses that might allow for broader generalization of the relationship. Marantz (1984:181) cites as evidence for his polysemy approach the fact that "unlike passivization, for example, the anticausative alternation is limited cross-linguistically to a restricted class of verbs with some semantic coherence" and the fact that not all causative verbs undergo anticausativization (e.g., *cut*).

Like the MH, the theory of grammatical relations developed by Marantz (1984) predicts that lexical rules like anticausativization should not exist; it would certainly be convenient for the hypothesis proposed herein if it did not. Now, it certainly would be consistent with the MH if anticausativization were not productive—recall that as discussed in Chapter 2, the MH is a hypothesis about productive lexical rules taking a set of lexical entries as primitives. The MH has nothing to say about the semantic nature of the primitive lexical entries, so if what looked like anticausativization were instead due to polysemous lexical entries, that would suit the MH fine. Research that has been carried out in lexical semantics subsequent to Marantz's (1984) research, however, I believe makes his conclusion less plausible than it may have seemed at the time.[7] Hale and Keyser (1987, 2002), Pinker (1989), Jackendoff (1990), Levin (1993), and Levin and Rappaport Hovav (1995) in particular have shown that once the lexical semantics of verbs are looked at in much more detail than was possible for Marantz (1984) at the time of his research, behavior that initially may appear as idiosyncrasy, appears to have much more rule-governed behavior. That is, lexical semantics is rule governed in a way not entirely unlike syntax. Closer to home, it has been shown, for example, that contrary to the suggestions of Marantz (1984:182) there are systematic reasons that not all verbs with causative components have inchoative alternates, one of Marantz's main justifications in making his non-productivity claim. Specifically, it is only causative verbs whose causer is somehow underspecified that alternate (Guerssel *et al.* 1985; Hale and Keyser 1987; Levin and Rappaport Hovav 1995; Reinhart 1996). With this in mind, a better, more exceptionless rule of anticausativization can be formulated, making the process look more productive, if semantically constrained.

Thus, despite the fact that it would be entirely consistent with the MH, I reject the idea that anticausativization simply be analyzed as polysemy. It should be noted, however, that even for those who might still subscribe to Marantz's (1984) view that anticausativization is unproductive and should be treated simply as polysemy in lexical entries, the MH can still be accepted—denial of the existence of anticausativization is

[7] See also Haspelmath (1987:17ff.) who disputes the non-productivity claim.

entirely consistent with the MH. I just happen to believe that research in lexical semantics over the last twenty years does not support this conclusion.

7.3.2 Deletion

Perhaps the most obvious analysis of anticausativization is derived from the causative via deletion of the CAUSE operator and the associated causing subevent. Precisely an analysis along these lines has been proposed at various times since at least Grimshaw (1982), if not before. Though the details of the statement of anticausativization differ, analyses in this spirit have been proposed not only by Grimshaw (1982), but also by Reinhart (2002), Reinhart and Siloni (2005), Kallulli (2006a), and Härtl (2003). Grimshaw's (1982:103ff.) "inchoativization rule" in (35), developed in the context of an analysis of anticausativization in French, captures the essence of these kinds of analysis.

(35) Grimshaw's (1982:103ff.) inchoativization rule
Pred$_{cause}$: CAUSE (x, BECOME (Predicate (y))) $\longrightarrow$
Pred$_{inch}$: BECOME (Predicate (y))

The idea is simply that anticausativization (or *inchoativization*, as Grimshaw calls it) takes a causative COS lexeme, strips it of its CAUSE operator and causer argument (or causing subevent on a more Davidsonian view) leaving behind only the COS meaning. On this analysis, it is obvious why there should be a morphological asymmetry in the direction that there is—inchoative is derived from causative, and therefore it makes sense why the former should be morphologically marked and the latter unmarked.

Deletion analyses, however, at least the ones that have thus far been presented in the literature, fail on several other counts. First, although they capture the morphological markedness asymmetry between causative and inchoative in anticausativization, they fail to capture the fact that the morphological marker of anticausativization is so commonly also used for reflexivization operations there is no obvious link between deletion of a CAUSE operator and the semantic nature of reflexivization. Related to this observation, they also do not capture the diachronic relationship between reflexivization and anticausativization, i.e., the fact that anticausative markers very commonly (if not always) develop from reflexive markers. I do not rule out the possibility that some analysis could be developed that could capture these facts. Such an analysis, however, is neither obvious, nor anywhere developed in the literature.

Going beyond these morphosemantic problems, these analyses generally do not handle non-alternation well—that is, they fail to adequately explain why it is that only COS verbs with underspecified causers undergo anticausativization. Of course, this observation can be stipulated as part of the rule of anticausativization, as it is in Reinhart's (2002) and Reinhart and Siloni's (2005) analysis, but on such an analysis there is nothing about the nature of anticausativization such that this kind of behavior is expected. If deletion rules are allowed, all that is required is to have the right set of diacritics, as in Reinhart's system, that are deletable. As I discuss below, I believe a deeper analysis is possible from which non-alternation follows not by stipulation in the rule of anticausativization itself, but instead as a consequence of the architecture of the analysis itself.

A final problem with deletion analyses, somewhat independent and somewhat related to the question of the MH, is that, as discussed in Chapter 2, rules that delete decompositional operators cannot be formalized within standard systems of function-argument application, like the typed lambda calculus, and indeed no attempt has been made in the literature to ever formalize a deletion analysis of anticausativization.[8] Of course, I do not believe that an analysis is inherently bad because it cannot be formalized. I do believe, as discussed above, however, that it is perhaps cause for concern. As I ultimately show, what I believe to be the right analysis on empirical grounds is both consistent with the MH and is indeed formalizable without any non-standard assumptions about the nature of semantic composition.

[8] According to Itamar Francez (p.c.), precisely this kind of criticism was made by Edit Doron in the question/answer period following Reinhart's (2006) talk on the causative-inchoative alternation at the 2006 meeting of the Israeli Association for Theoretical Linguistics.

7.3.3 Least common denominator approaches

Another approach to anticausativization treats both the causative and the inchoative variants as derived from a more abstract root (see also the discussion in §2.5.2). This is the approach of Doron (2003).[9] Doron adopts a "little v" analysis of external arguments, so that external arguments are not part of the lexical entry of verbal lexemes, but are instead merged with roots in the syntax (Kratzer 1996; Pesetsky 1995; Marantz 1997; Arad 2003). Her analysis of middle morphology in Hebrew, the language she focuses on, is then that it precludes the licensing of little *v* by the root. To take an example, her analysis of causative and inchoative *break* in Hebrew are as in (36) and (37) respectively, where bits of morphology are projected in various syntactic positions consistent with her Distributed Morphology approach.

(36) y šavar et x
y break.SIMPL ACC x

$\lambda e[break(e,x) \wedge Agent(e,y)]$

y $\quad \lambda y \lambda e[break(e,x) \wedge Agent(e,y)]$

$[\![v]\!] = \lambda y \lambda e[Agent(e,y)] \quad \lambda e[break(e,x)]$

x $\quad \lambda x \lambda e[break(e,x)]$

(37) x nišbar
x break.SIMPL.ANTICAUS

$\lambda e[break(e,x)]$

x $\quad \lambda x \lambda e[break(e,x)]$

$\mu \quad \lambda x \lambda e[break(e,x)]$

[9] Juarros (2003) takes a somewhat similar approach to anticausativization.

Doron's idea is that the meaning of the root upon which causative and inchoative *break* are built upon has (presumably) the core COS semantics of *break* alongside the specification that it takes an internal argument. The causative variant in (36) arises via merger of this root with little *v*, which adds an agentive causer to the structure.[10] The inchoative version in (37), for its part, is derived from this root via merger with the middle morpheme μ, whose sole function is to prevent merger of the root with little *v*, thereby preventing the structure from having an agentive external argument.

This kind of analysis is entirely consistent with the MH—as can be clearly seen from the structures in (36) and (37), Doron's proposed analysis of anticausativization involves no deletion of decompositional operators. Because the denotation of the root does not include CAUSE semantics in the first place, anticausativization need not remove any CAUSE related operators (represented by Doron's "Agent" predicate in the structures above). Instead, as stated above, the anticausative morphology, on an analysis like Doron's, simply prevents little *v*, the element with CAUSE semantics, from being merged with the root in the first place. Thus, one can adopt an analysis like Doron's without running into problems with the MH.

Despite this, I believe there are empirical considerations militating against an analysis like Doron's (2003). Ignoring any problems that Doron's proposal inherits from the adoption of the not uncontroversial little *v* hypothesis (Horvath and Siloni 2002; Wechsler 2005), which causes no problems for the MH in any event, this analysis encounters problems with the morphological, syntactic, and semantic facts. First, this analysis, and others analyses adopting the Root Hypothesis (see §2.5.2) fails to account for the most basic of morphological facts, namely the morphological markedness asymmetry. As seen clearly in the data in the introduction to this chapter, as well as in the data from Hebrew in (36) and (37), anticausativization is characterized by a morphologically marked inchoative variant corresponding to a morphologically unmarked causative variant, the verb in (36) appearing in the marked *nif'al* template and (37) in what Doron calls the "simple" template. On Doron's analysis, both causative *and* inchoative are derived

[10] I ignore here what I believe to be well-founded concerns (dating at least to DeLancey 1984) expressed by Alexiadou *et al.* (2006) regarding the conflation of agentivity and causation in little *v* analyses. They propose remedying this by creating different types of little *v* heads. While I believe an adequate little *v* analysis would require this, it is tangential to the matters under discussion here.

from a more abstract root. Now, there are clearly certain predicates in certain languages for which an analysis like this seems well motivated. Consider, for example, the derivation of words naming non-causative and causative changes into property concept states in Warlpiri as laid out by the data in (38).

(38) Warlpiri (Hale and Keyser 1998:93)

	Property concept	Non-causative COS	Causative COS	
a.	wiri	wiri-jarri-	wiri-ma-	'big'
b.	maju	maju-jarri-	maju-ma-	'bad'

Although the particular analysis given by Doron whereby μ has no direct impact on the lexical semantics of the root is probably not correct for Warlpiri *–jarri*, the data illustrate the basic point that the morphology motivates the separate derivation of causative and inchoative from a more abstract root in Warlpiri.[11] The morphology in Hebrew, however, does not, at least on the surface, motivate this kind of indirect relationship between causative and inchoative, at least for verbs like *break*.[12] The problem, on Doron's analysis, can be placed on the little-*v* analysis for *break*-type verbs, the fact that causative is derived with little *v*, with no morphological exponent. Again, as already discussed, this would not be a problem were it not for the fact that adherents of such analyses are forced to posit phonologically null little *v*'s for the causative variants of verbs naming *break*-type events in language after language. In this way, such analyses miss significant typological generalizations.

Moving beyond the markedness asymmetry, this analysis has additional morphological and semantic problems in that it fails to explain why it is that the same morphemes used for anticausativization also get used for reflexivization. Indeed, according to data due to Itamar Francez (p.c.), this is true also, at least on occasion, in Hebrew, as shown by the examples in (39) and (40).

[11] Another difference would be that for the data in (38), the root would have a property concept state denotation, while the root upon which *break* is built for Doron, although she is not clear about it, seems most likely as though it would have a non-causative COS denotation. Nevertheless, these data serve to illustrate the point.

[12] Deadjectival verbs in Hebrew behave differently, as shown by the data in Doron (2003:61ff.). This is not surprising—crosslinguistically COS verbs based on property concept states commonly are encoded differently from *break*-type COS verbs, as I show in Koontz-Garboden (2006c).

(39) a. šavar
break
'break(trans)'

b. ni-šbar
ni-break
'break(intr.)' (Doron 2003:12,41)

(40) a. dani nirsham la-kurs.
dani ni-write.PAST.3ms to.the-course
'Dani signed (self) up for the course.' (Itamar Francez, p.c.)

b. lex tishatef ba-berez.
go ni-wash.FUT.2ms in.the-faucet
'Go wash yourself in the faucet.' (Itamar Francez, p.c.)

c. nidxaf
'push oneself' (Doron 2003:8)

What the data in (39) and (40) show is that the nif'al template in Hebrew has not only anticausative uses as in (39b), but, at least for some roots, reflexive uses as well, as shown in (40).[13] The observation, again, is that given how commonly these two functions are marked in morphologically identical ways, and the fact that diachronically one very often develops from the other, there ought to be some link between them. There is nothing, however, in Doron's analysis which suggests the semantic relatedness of reflexivization and anticausativization. On her analysis, anticausativization is an operation which simply voids the licensing of little v. Reflexivization, however, makes the two arguments of a transitive verb the same. Perhaps there is a way of reconciling these two functions. If there is, however, it is not clear how that would be.

[13]The situation in Hebrew is more complicated than is worth going into here. It is worth pointing out, though, as Beth Levin (p.c.) notes, that the nif'al template is not the one normally used for reflexives. Instead, another morphologically marked template, the so-called "hitpa'el" generally serves this function (Simons 1995:144). Still, in accordance with the general observations in this section, it is worth noting that not only reflexives but inchoatives can be found in hitpa'el, a fact noted by (Simons 1995:144ff.).

Concluding this section, I note that those who are unconvinced by my dissatisfaction with Doron's analysis, can adopt both Doron's analysis and the MH without any problem. My concerns with Doron's analysis have nothing to do with the MH—it is indeed consistent with it, and if an analysis of anticausativization like hers were correct, there would indeed be no problems for the MH.[14] Instead, my concern with this kind of analysis has to do with the fact that it misses several significant typological facts both about direction of derivation from causative to inchoative with *break* type verbs and about the synchronic and diachronic nature of the morphological marker of anticausativization crosslinguistically. I believe a comprehensive analysis of the phenomenon should account for these facts.

7.3.4 Existential binding

Levin and Rappaport Hovav (1995:Chapter 3) develop an analysis of anticausativization on the basis of data from English, which they believe to have a causative-inchoative alternation characterized by anticausativization, rather than causativization, contrary to

[14] A quite different kind of least common denominator approach is that of Piñón (2001a). While Doron claims that the causative and inchoative are built up from a semantically unspecified root, Piñón claims that causative and inchoative are also derived from a root, but from a root that denotes what he calls a "causative-inchoative pair." His observation is that crosslinguistically, both directions of derivation are observed, from causative to inchoative and from inchoative to causative. From this, he concludes that causative and inchoative are derived from a common source—a root containing both the causative meaning and the inchoative meaning. So, for him, both causative and inchoative are derived, the causative derivation picking out the causative part of the pair that is the denotation of the root, the inchoative derivation picking out the inchoative part of the pair. Although this kind of analysis is very different from an analysis like Doron's, I believe that the morphological grounds for rejecting it are quite similar—the analysis fails to capture Haspelmath's (1993) observation that different kinds of events are lexicalized in different ways crosslinguistically. I believe it is these differences in the nature of the eventualities that is the cause for the differences in direction of derivation. So again, on empirical grounds alone, I do not believe that such an analysis is the right kind of analysis of the causative-inchoative alternation, whether the direction of derivation is causativization or anticausativization.

An independent question is whether Piñón's (2001a) analysis is consistent with the MH. Evaluation of this question revolves around what exactly the nature of his causative and inchoative derivations is, and additionally what the nature of the meaning he assigns to his root is. One possibility is to take his causative-inchoative pair meanings (the denotation of roots on his analysis) as simply saying that roots are polysemous in their meanings, and that the causative and inchoative derivations simply pick out one or the other meaning. In this way, neither the causative nor the inchoative derivation, on his analysis, involves the addition or deletion of decompositional operators; both meanings are in the root, and each derivation picks out one of them. In this case, his analysis would indeed be in compliance with the MH.

most analyses of English (Lakoff 1965; Pinker 1989; Jackendoff 1990; Hale and Keyser 2002; Baker 2003; Embick 2004). Regardless of whether anticausativization is right for the facts of English or not, their analysis of anticausativization is worth considering in the context of languages that unambiguously show the anticausative direction of derivation from causative to inchoative.

Drawing on the work of Smith (1970) and Labelle (1992), among Levin and Rappaport Hovav's (1995) more important innovations is the observation that there exist not one, but two semantic classes of inchoative verbs, contrary to what was generally believed prior to their work. The distinction they make, already discussed in the context of Ulwa in Chapter 5, is between verbs naming what they call "internally caused" and "externally caused" eventualities. The idea in the context of COS verbs, further elaborated in Rappaport Hovav and Levin (1998), is that while some COS events are brought about by a force external to the entity undergoing the COS, other COS events are brought about by the entity undergoing the change itself.[15] The decompositional representations they propose for the lexical semantics of these two kinds of inchoative verbs are given in (41), with their representation for causative COS verbs given in (42) (Levin and Rappaport Hovav 1995; Rappaport Hovav and Levin 1998).[16]

[15]For further discussion of the semantic differences between internally caused and externally caused COS verbs, see Chapter 5.

[16]The representation given in (41b) for externally caused intransitive COS verbs is not precisely what is given by Levin and Rappaport Hovav in their writings. In fact, they do not given an explicit event structure representation for these. The representation in (41b) is, however, what I believe is suggested by their discussion in e.g., Levin and Rappaport Hovav (1995:108), with an existentially bound causing subeventuality. Another possible reading, however, is that the denotation of externally caused intransitive COS verbs has rather than an existentially bound causing subeventuality, instead an existentially bound *argument* of a causing subeventuality. Marcotte (2005:11) discusses these two possible analyses, arguing ultimately for the alternative of binding of the causing subevent.

Ultimately, what this ambiguity points to is an incomplete formalization of the existential binding analysis in Levin and Rappaport Hovav (1995). Unlike the deletion analysis, which as discussed above has probably never been formalized because of the formal problems that would be encountered in doing so, theirs would be easy to formalize, given a Davidsonian semantics, once it was clear whether the intent is to existentially bind an event or a participant in an event. Regardless of what was intended, I will adopt an interpretation of their analysis, following Marcotte's proposal, whereby it is the causing event, rather than the argument of the causing event that is existentially bound. As Marcotte (2005:11) notes, this raises questions about what happens to the argument of the event in anticausativization, another issue that would have to be fleshed out in a formal analysis of existential binding. Because I ultimately do not adopt the existential binding analysis, I leave this issue unexplored.

(41) The lexical semantics of two kinds of intransitive COS verb (Levin and Rappaport Hovav 1995; Rappaport Hovav and Levin 1998)

a. “internally caused”: [BECOME [x <STATE>]]

b. “externally caused”: $\exists e[e$ CAUSE [BECOME [x <STATE>]]]

(42) The lexical semantics of causative COS verbs (Levin and Rappaport Hovav 1995; Rappaport Hovav and Levin 1998)
[[x do something] CAUSE [BECOME [x <STATE>]]]

Levin and Rappaport Hovav’s idea is that externally caused intransitive COS verbs, with denotations as in (41b), are derived from causative verbs via some kind of existential binding operation (which is left unformalized, see fn. 16). The intransitive COS verb resulting from this operation is left with its CAUSE operator intact, so that its lexical semantics specify that the COS event denoted by such a verb came about via some kind of cause external to the entity undergoing the COS event.

The claim that there is not one kind of inchoative verb, as previously believed, but instead two has serious implications for the MH, since differences in lexical semantic representations lead to different predictions about derivational relationships. More specifically, while the derivation of an inchoative verb with a meaning like (41a) from a causative verb with a meaning like (42) is predicted by the MH to be unattested, since it involves the deletion of a CAUSE operator, the derivation of an inchoative verb with a meaning like that in (41b) from a causative verb does not violate the MH, since no operators would be removed in such a derivation.

Further, the Levin and Rappaport Hovav analysis, unlike some analyses discussed up to this point, fares well on certain of the core criteria imposed above on analyses of anticausativization. First, concerning morphology, on their analysis there is a straightforward explanation of the morphological asymmetry in anticausative alternations. On their analysis, morphologically marked inchoative lexemes are derived directly from causative lexemes. Stated another way, for Levin and Rappaport Hovav, there is a significant set of COS events that are lexicalized as causative verbs. Inchoatives that come about via anticausativization are derived from these, providing an explanation for why the inchoative, in such instances, is morphologically marked and the causative is not.

Although the existential binding analysis of anticausativization fares better than most, there are still facts of the phenomenon laid out above that it does not naturally capture, at least given the discussion in Levin and Rappaport Hovav (1995). First, like all other analyses discussed in this chapter, there is no natural explanation for the reflexivization/anticausativization syncretism or for the grammaticalization path of anticausative from reflexive. Secondly, although Levin and Rappaport Hovav (1995) are among the first to clearly show that it is causative verbs with fully specified causers that fail to have inchoative counterparts, how this follows from their existential binding analysis is not clear. The claim is that the existential binding operation can apply only to lexical semantic representations with unspecified causers (Levin and Rappaport Hovav 1995:107). Absent formalization of this operation, however, it is difficult to view this as much more than a stipulation to their analysis. At the moment it sounds not so different from Reinhart's (2002) claim that deletion applies only to causers with particular features.

As with Doron's (2003) analysis, my concerns with the existential binding have nothing to do with the MH—the existential binding analysis is indeed consistent with the MH. So, again, one could completely reject the criticisms leveled at the existential binding analysis in this section and still accept the MH. What I have suggested instead is that there are empirical facts surrounding the phenomenon of anticausativization that the existential binding analysis does not seem fully equipped to handle. This does not detract, however, from some of the more central empirical findings of Levin and Rappaport Hovav (1995), uncovered in the context of their analysis—the non-alternation of causative verbs with fully specified causers and the existence of two distinct classes of intransitive COS verb, one with a CAUSE (the ones derived via anticausativization) and one without (the ones that are lexically basic as intransitive COS verbs). Empirically, I draw on both of these findings in the analysis developed below.

7.3.5 Frequency

Haspelmath (2005) argues that the morphological complexity of a causative or inchoative lexeme mirrors the frequency of use of that lexeme in discourse. His idea is that given a morphologically marked/unmarked pair, the marked variant will always be more frequent in discourse than the unmarked variant. In the domain of the causative-inchoative alternation, the idea, then, is that if, for example, causative *break* is morphologically marked relative to inchoative *break*, then it is the case that in discourse causative *break* is more frequent than inchoative *break*. Although Haspelmath (2005) does not present frequency data to support this hypothesis, it seems at least initially plausible. I do not believe, however, that this constitutes an explanation of anticausativization. Instead, I believe what Haspelmath (2005) explains are facts of *lexicalization*, which in turn determines what is basic in the lexicon, and in turn indirectly determines, what will be derived from what. That is, if causative is lexically basic, then inchoative will be derived from it by one kind of rule (anticausativization), while if inchoative is lexically basic, causative will be derived from it by a different kind of rule (causativization). Haspelmath's is a claim about the kinds of events that people most commonly talk about and about how this impacts basic lexicalization, for example why causative would be morphologically basic for certain kinds of events (e.g., *break*-type events) while inchoative would be morphologically basic for other kinds of events (e.g., *freeze*-type events). The claim is that with breaking events, for example, these are typically talked about in real discourse with an overt external causer, while this is not the case for freezing events, thus accounting for the fact that crosslinguistically breaking events are typically lexicalized in their morphologically simple form as causatives while freezing events are typically lexicalized in their morphologically simple form as inchoatives (Haspelmath 1993). It is important to point out, however, that this is not an analysis of anticausativization—it is an analysis of certain facts of lexicalization. In the Montagovian terms laid out in chapter 2, Haspelmath's results are about the nature of the set of *basic expressions*—namely, what the denotations of the members of that set are—while this chapter is concerned with the nature of the *lexical rules* that operate on this set of basic expressions. Thus, one can accept Haspelmath's results, while still seeking to understand the synchronic grammatical process that is anticausativization.

7.4 Concluding remarks

This chapter began with the strong prediction of the MH in (1c), repeated in (43).

(43) Words naming non-causative COS events are never derived from words naming causative COS events.

I began by showing that, consistent with the prediction in (43), it is indeed often the case that words naming causative COS events are derived from words naming non-causative COS events. Inconsistent with that prediction, however, is the phenomenon known as anticausativization, a widely attested kind of word formation operation in which words naming non-causative COS events are derived from words naming causative COS events. I went on to lay out the facts of this phenomenon following this by a discussion of previous approaches to it in the theoretical literature. Although only one of the reviewed analyses, the deletion analysis whereby anticausativization entails deletion of a CAUSE operator, is actually inconsistent with the MH, it is by far the most widely assumed analysis. Further, even those analyses that *are* consistent with the MH were found to be empirically inadequate for other reasons. In light of this, in the next chapter, I go on to develop my own analysis of anticausativization in which I treat it as a reflexivization analysis, building on previous work in this area by Chierchia (2004). Not only do I show this analysis to be the best analysis on empirical grounds, but I also show it to be consistent with the MH. In this way, then, anticausativization, despite initial appearances to the contrary, is shown not to violate the MH.

Chapter 8

Anticausativization is reflexivization

8.1 Introduction

In the preceding chapter I laid out the basic facts of anticausativization and considered various approaches to the phenomenon in light of them. I showed that while all previous analyses with the exception of deletion are consistent with the Monotonicity Hypothesis, they all fail to capture core facts of the phenomenon. In this chapter I lay out an analysis of anticausativization that not only is consistent with the MH, but which also captures the facts laid out in Chapter 7 in a way that no previous analysis does. This analysis treats anticausativization as a kind of reflexivization operation. Although analyses along these lines have been frequently suggested informally (Lakoff 1971; Garcia 1975; Siewierska 1984; Faltz 1985; Haspelmath 1990; Kemmer 1993; Reinhart 1996; Wunderlich 1997b), the idea has been developed in formal detail only by Chierchia (2004), who is actually much more concerned with the facts of unaccusativity than those of anticausativization, many of which he does not address. In this chapter I pick up where Chierchia left off, developing in detail an event semantics analysis of anticausativization as reflexivization which I believe is in the spirit of his proposal. In addition, I also take into account the range of facts outlined in Chapter 7, many of which were not considered by Chierchia. In doing so, I show how this analysis accounts for them straightforwardly. Further, I show that this analysis is not only consistent with the MH, but also is, on independent grounds, the best analysis of anticausativization, as it accounts for certain facts of the phenomenon that other approaches fail to capture. I conclude that anticausativization, rather than posing problems for the MH, in fact provides support for the hypothesis.

I begin by laying out the core of the analysis of anticausativization as reflexivization. I then show this to be a comprehensive analysis that captures the wide range of facts of the phenomenon laid out in Chapter 7. Next, I give empirical arguments showing there to be a CAUSE operator in the lexical semantic representation of inchoative verbs derived from their causative counterparts via anticausativization, an important empirical observation in light of the claims of the MH. Finally, I discuss false arguments against the reflexivization analysis and summarize the results of this chapter.

8.2 Anticausativization as reflexivization

8.2.1 Assumptions

In developing the semantic analysis of anticausativization as reflexivization, I draw on the formal tools of neo-Davidsonian event semantics with thematic relations relating participants to eventualities (Parsons 1990).[1] Eventualities v come in two different sorts, events (achievements, activities, and accomplishments) e and states (for stative predicates) s (cf. Bach 1986).[2] The thematic roles used in the representations are to be taken simply as a shorthand for proto-role entailments (Dowty 1991). A root can specify of its arguments more or less entailments, from highly articulated specification to rather serious underspecification. E.g., some verbs are highly specified and take only an agentive subject, while others are underspecified and can take agents, instruments, natural forces, etc. For the theta-role relation that is underspecified, I use the label EFFECTOR, following Van Valin and Wilkins (1996), so that the basic starting point for the representations of states and changes of state in this chapter is in (1).

[1] As previously discussed in Chapter 2, although I use a formal representation typical of neo-Davidsonian theories, I do not adopt neo-Davidsonian assumptions about argument composition. See §2.6.1 for further discussion.

[2] This is not an entirely uncontroversial assumption—there is recent work arguing against a stative eventuality argument (Katz 2003; Maienborn 2005). Nothing in what I will say below crucially relies on the existence of stative eventuality arguments. I assume them for simplicity, but they could be dispensed with.

(1) a. $\lambda x \lambda s[\phi(s) \wedge THEME(s, x)]$
b. $\lambda x \lambda s \lambda e[BECOME(e, s) \wedge THEME(s, x) \wedge \phi(s)]$
c. $\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, y) \wedge BECOME(e, s) \wedge THEME(s, x) \wedge \phi(s)]$

Of course, as I have hinted in the preceding chapter, the representation for inchoatives in (1b) is an oversimplification—in particular, as I show below, inchoatives derived via anticausativization have a CAUSE operator as part of their lexical semantic representation. The representations in (1), however, serve as a good point of departure from which to develop a more articulated, and ultimately, I believe, more accurate view of the lexical semantics of intransitive COS verbs.

With this as background, I now turn to the reflexivization analysis, showing along the way how it accounts for the facts of anticausativization.

8.2.2 Reflexivization

Reflexivization is a formally well-understood operation.[3] Quite simply, it takes a relation as an argument, setting both arguments of the relation to be the same (Chierchia 2004:29). In set-theoretic terms, if a relation is conceived of as a set of pairs, what reflexivization does is to restrict the denotation of the relation to those sets of pairs each of whose members is identical to the other. The reflexivization operator, then, can be formalized in (2), where $\mathfrak{R}$ is a variable ranging over functions from sets of pairs to sets of events, i.e., the reflexivization operator takes arguments of the type of transitive verb, $< e < e < v, t >>>$.

(2) The reflexivization operator
$\lambda \mathfrak{R} \lambda x[\mathfrak{R}(x, x)]$

[3]In this section and in what follows, I gloss over whether the reflexivized predicate is syntactically transitive or intransitive. As observed by Sells *et al.* (1987), crosslinguistically there turn out to be reflexivized predicates of both kinds. How these facts interact with anticausativization is something that remains to be explored. This is an area for future research, possibly with interesting typological and theoretical implications.

I should point out that something like (2) would be what I take to be the denotation of reflexive clitics, like the Spanish *se*, as discussed further below. Reflexive pronouns, like English *himself*, etc., are somewhat more complicated, as these seem to have agentivity inferences often associated with them. Indeed, it seems to be the case in the literature that reflexivization is typically taken to involve agentivity, such that the single argument of a reflexive construction agentively acts upon him/herself (discussion in e.g., Piñón 2001b and Härtl 2003, for example, suggests this). The reflexivization operator in (2), however, says nothing about whether the argument is agentive or not. This confusion may come about as a result of the fact that much discussion centers on English, in which reflexive markers are pronominal, and therefore often animate. As discussed in §8.3.7, however, even in English it is not always the case that pronominal reflexives are used with verbs that necessarily have an agentive argument. Nevertheless, in what follows, I use the term "reflexive-type interpretation" to suggest an interpretation of a reflexive construction in which the single argument seems to have agent-oriented inferences on a par with those that the single argument in e.g., (3) has.

(3) Kim dressed herself.

I will have more to say about reflexive pronouns below. First, however, I turn to the role of reflexivization as laid out in (2) in anticausativization.

8.2.3 The core of the analysis: alternating COS verbs

I begin by laying out how the reflexivization analysis treats the core class of alternating verbs that undergo anticausativization, what Levin (1993) calls the *break* verbs, and what Levin and Rappaport Hovav (1995) call externally caused COS verbs. I use Spanish as the language of analysis.

The core observation, as already discussed at length throughout the previous chapter, is that alternating verbs have in their morphologically unmarked form a causative use as illustrated in (4). In addition, when appearing with a reflexive clitic, they also have an inchoative use, as illustrated in (5).

(4) a. Juan rompió el vaso.
Juan broke the cup
'Juan broke the cup.'
b. Juana abrió la puerta.
Juana opened the door
'Juana opened the door.'
c. Kim quemó el papel.
Kim burned the paper
'Kim burned the paper.'

(5) a. El vaso se rompió.
the cup REFL broke
'The cup broke.'
b. La puerta se abrió.
the door REFL opened
'The door opened.'
c. El papel se quemó.
the paper REFL burned
'The paper burned.'

According to Guerssel *et al.* (1985), Hale and Keyser (1987), and Levin and Rappaport Hovav (1995:85), what is special about the transitive variant of an alternating verb is that it specifies a COS without specifying how the change comes about. More specifically, while it specifies that there is a causing event, it says nothing beyond this. According to Levin and Rappaport Hovav (1995:85), this is responsible for the fact that there are very few restrictions on the possible subject of transitive *break*.[4] This is apparently also true in languages with anticausativization, like Spanish (Mendikoetxea 1999b:1589), German (Alexiadou *et al.* 2006), and Greek (Alexiadou *et al.* 2006). The Spanish data in (6) from Mendikoetxea (1999b), for example, show that the subject of a causative verb like *romper* 'break' in Spanish can be not only an agent (6a), but also an

[4] See also discussion in Reinhart (1996:17).

instrument (6b), a natural force (6c), or a stative eventuality (6d).

(6) a. Juan rompió la mesa.
Juan broke the table
'Juan broke the table.'
b. El hacha rompió la mesa.
the axe broke the table
'The axe broke the table.'
c. El huracán rompió la mesa.
the hurricane broke the table
'The hurricane broke the table.'
d. El peso de los libros rompió la mesa.
the weight of the books broke the table
'The weight of the books broke the table.' (Mendikoetxea 1999b:1589)

In addition, events can also be found as the subjects of causative verbs like *romper* 'break', as shown by the naturally occurring example in (7).

(7) La explosión rompió ventanillas de automóbiles y las ventanas de edificios
the explosion broke windows of automobiles and the windows of buildings
vecinos.
adjacent
'The explosion broke the windows of automobiles and the windows of adjacent buildings.' (*Google*)

Assuming a neo-Davidsonian representation of the lexical semantics of verbs alongside the considerations already laid out in previous chapters regarding the representation of the lexical semantics of COS verbs, these facts motivate a denotation of the transitive/causative variant of anticausativizing verbs like *romper* as in (8).

(8) $[\![romper]\!] =$
$\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge EFFECTOR(v,y) \wedge BECOME(e,s) \wedge$

$THEME(s, x) \wedge not\text{-}whole(s)]]$

The idea encapsulated by the representation in (8) is that *romper* denotes an event e of a participant x coming to be in a state s of not being whole, with that COS event being caused by another eventuality v in which another entity y is a participant. While the verb *romper* lexically specifies that the entity undergoing the COS event is a theme participant in some stative eventuality, as evidenced by the data in (6), little is known about the nature of this participant—it may be an agent, an instrument, a natural force, etc. Its underspecification is represented in (8) by use of Van Valin and Wilkins's (1996) EFFECTOR role, a kind of generalized semantic role.

Recall, now, that the intransitive COS verb in Spanish is derived from the transitive by an operation resulting in the addition of the reflexive clitic *se*, used elsewhere as a reflexive (cf. the discussion in §8.2.2), as in (9), for example.

(9) Kim se pegó (a sí mismo).
Kim REFL hit to self only
'Kim hit herself.'

The reflexive clitic *se* is a marker of reflexivization in the sense of (2). As already discussed, what a marker of reflexivization like *se* does is to take a two argument predicate and reflexivize it, giving it the denotation in (10) (cf. (2)).

(10) $[\![se]\!] = \lambda\mathfrak{R}\lambda x[\mathfrak{R}(x, x)]$

The result of applying this function to the denotation of a transitive/causative verb like *romper* 'break (trans)' in (8) is given in (11).

(11) $[\![se]\!]([\![romper]\!]) =$
$\lambda\mathfrak{R}\lambda x[\mathfrak{R}(x, x)](\lambda x\lambda y\lambda s\lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, y) \wedge$
$BECOME(e, s) \wedge THEME(s, x) \wedge not\text{–}whole(s)]]])$
$= \lambda x[\lambda x\lambda y\lambda s\lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, y) \wedge BECOME(e, s) \wedge$
$THEME(s, x) \wedge not\text{–}whole(s)]](x, x)]$
$= \lambda x\lambda s\lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, x) \wedge BECOME(e, s) \wedge$

$THEME(s, x) \wedge not\text{–}whole(s)]]$

That is, the denotation of the anticausative *romperse* 'break (intrans)' is as in (12), a function from ordinary individuals to set of events in which the individual is a participant in an event that causes a COS event in which it is also a participant.

(12) $[\![romperse]\!] =$
$\lambda x \lambda s \lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, x) \wedge BECOME(e, s) \wedge$
$THEME(s, x) \wedge not\text{–}whole(s)]]$

On this analysis, then, anticausativization is semantically a reflexivization operation, and is completely consistent with the MH—the CAUSE operator is removed, but rather the relation is simply reflexivized so that the participants in both the causing the the caused eventualities are specified to be identical. Further, because the lexical specification of alternating verbs like *romper* 'break' is such that the participant in the causing event is thematically underspecified, there is no prediction that the single argument of the anticausative verb should have agent entailments, since neither the verb's semantics nor the semantics of the reflexivization operator specify agent entailments for their arguments (more on this in §8.3.1 and §8.3.2).

In this section, I have shown that a reflexivization analysis of anticausativization is at least formally plausible. In particular, I have shown how it could be that the anticausative under a reflexive analysis could at once have a CAUSE operator as part of its denotation and lack agent entailments, one of the typical criticisms raised of such an analysis (Piñón 2001b). As discussed above, this follows from the lexical semantics of the verbs that reflexivization operates on—since the participant in the causing subevent need not be an agent, under reflexivization there is no entailment that the undergoer of the COS event (also the EFFECTOR participant in the causing subevent) have agent entailments.

8.3 Reflexivization and the empirical benchmarks

In §7.2, I laid out a range of facts surrounding the phenomenon of anticausativization that I believe a comprehensive analysis of the phenomenon should capture. In this section, I evaluate the reflexivization analysis in light of these facts, showing how it captures them.

8.3.1 Non-alternation I: *Cut*-type verbs

As has been noted by Guerssel *et al.* (1985), Hale and Keyser (1987), and Levin and Rappaport Hovav (1995), not all COS verbs are like *break* in having a thematically underspecified causer argument. Indeed, there are verbs like *cut*, which seem to specify that the causer of the COS event is an agent. As a consequence, while sentences like (13a) are acceptable, sentences in which the causer of the cutting event is an event (13b), natural force (13c), or stative eventuality (13d), are generally judged unacceptable in English.[5]

(13) a. Kim cut the cloth.
b. *The explosion cut the cloth.
c. *The lightning cut the cloth hanging on the clothesline.
d. *Age cut the cloth.

Interestingly, such verbs fail to have inchoative alternates, as shown in (14).

(14) *The cloth cut.

This observation carries over to Spanish, a language with clear overt anticausativization. In Spanish, verbs naming events in which the thematic nature of the participant in the causing event is specified to be an agent lack anticausative variants, as shown by Mendikoetxea (1999b:1592).

[5]This is probably an idealization of the facts, at least for English *cut*, though one that is widely made in the literature. See the discussion in §8.3.7.

Verbs like *asesinar* 'assassinate', for example, have transitive/causative variants that admit only of agentive causers, as shown by the data in (15).[6]

(15) a. Kim asesinó a la senadora.
Kim assassinated to the senator
'Kim assassinated the senator.'

b. ?El hacha/La pistola asesinó a la senadora.
the axe/the pistol assassinated to the senator
'*The axe/the pistol assassinated the senator.' (zero Google hits)

c. ? El bombardeo asesinó a la senadora.
the bombing assassinated to the senator
'*The bombing assassinated the senator.' (two Google hits)

While such verbs have transitive/causative variants, they do not anticausativize, as shown by the data in (16) and (17) for the verbs *asesinar* 'assassinate' and *cortar* 'cut', both of which require of their subjects that they be agentive.

(16) a. Los terroristas asesinaron al senador.
the terrorists assassinated the senator
'The terrorists assassinated the senator.'

b. *El senador se asesinó (por sí solo).
the senator REFL assassinated (by self only)
'*The senator assassinated/was assassinated by herself.' (Mendikoetxea 1999b:1592)

[6]As noted, the judgements are based on the absence of attested examples like those above with Google searches such as "hacha asesino a", "pistola asesino a" (with the quotes), etc. Though rare, two examples like (15c) can be found, suggesting that eventive causers with such verbs may be slightly less marginal than instrument causers. One of the examples is given in (i).

(i) Una hora después, una segunda explosión asesinó a otras siete personas ...
'An hour later, a second explosion assassinated another seven people ...'
`http://www.lmcba.com.ar/2004/04-10-08/9_internac_01.htm`

(17) a. El panadero cortó el pan.
the baker cut the break
'The baker cut the bread.'
b. *El pan se cortó (por sí solo).
the bread REFL cut (by self only)
'*The bread cut/was cut by itself.' (Mendikoetxea 1999b:1592)

When continued by *por sí solo* 'by itself', which picks out the anticausative interpretation of *se* marked verbs as distinct from the passive as previously discussed in §7.2.1, (16b) and (17b) are unacceptable. It is not the case, however, that *asesinar* and *cortar* cannot appear with the reflexive *se* marker. They can, but simply have a different kind of meaning; as shown by the data in (18) *se* derived versions of verbs with these kinds of meanings, while they cannot have anticausative meanings, can have true reflexive-type meanings (Mendikoetxea 1999b:1591).

(18) El senador se asesinó.
the senator REFL killed
'The senator killed herself.'

(19) Kim se cortó.
Kim REFL cut
'Kim cut himself.'

This is, in fact, exactly what is predicted by the semantics given to *se* in (10), combined with the semantics of such verbs, independently motivated by the facts in (15). The transitive/causative COS verb *asesinar* 'assassinate', as previously discussed, as part of its lexical meaning specifies that the participant in the event that causes the COS event must be agentive. This is made explicit in (20), which gives the denotation of *asesinar* 'assassinate' in the neo-Davidsonian semantics assumed here.

(20) $[\![asesinar]\!] =$
$\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge AGENT(v,y) \wedge BECOME(e,s) \wedge$
$THEME(s,x) \wedge \textit{not-alive}(s)]]$

The main difference between a causative COS verb like *romper* 'break' and a causative COS verb like *asesinar* 'assassinate' is in the fact that while the denotation of the former is underspecified in the thematic nature of the participant in the causing eventuality, *asesinar* 'assassinate' is not. This is made clear by the lexical semantics given to the two verbs—while the participant in the causing eventuality of *asesinar* is specified to have AGENT entailments, as shown in (20), the participant in the causing eventuality in the denotation of *romper* 'break' is underspecified, as represented by the EFFECTOR relation in its denotation in (8), repeated in (21).

(21) $[\![romper]\!] =$
$\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge EFFECTOR(v,y) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge \textit{not-whole}(s)]]$

This relatively minor difference in the lexical semantics of the two verbs has a significant impact on the denotations of the two verbs when the reflexivization operator is applied to them. As already highlighted in (8) for *romper* 'break', because the causative variant does not have agent entailments, the reflexivized version also does not have agent entailments. For *asesinar*, however, the situation is different—when verbs with this kind of specification undergo reflexivization, they can only have "reflexive-type" meanings, as illustrated by the data in (18) and (19). Why this should be is made clear in (22), which shows the result of composing the meaning of *se*, as formalized in (10), with the meaning of *asesinar*, as formalized in (20), on this analysis.

(22) $[\![se]\!]([\![asesinar]\!]) =$
$\lambda \mathfrak{R} \lambda x[\mathfrak{R}(x,x)](\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge AGENT(v,y) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge \textit{not-alive}(s)]])$
$= \lambda x[\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge AGENT(v,y) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge \textit{not-alive}(s)]](x,x)]$
$= \lambda x \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge AGENT(v,x) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge \textit{not-alive}(s)]]$

According to the derivation in (22), the result of applying the reflexivization operator to a verb like *asesinar* is predicted to be what is generally known as a reflexive interpretation, i.e., an event in which a single agentive argument acts upon him or herself. As was shown by the data in (18) and (19), this is indeed the kind of meaning that verbs like *asesinarse* ‘assassinate self’ and *cortarse* ‘cut self’ have, as predicted by the analysis. Further, given the fact that these verbs subcategorize for agentive subjects, it is also predicted that they cannot have true anticausative meanings in which the single argument is a non-agentive undergoer of a COS event, as with e.g., the single argument of intransitive *break*. On my analysis this is a direct result of the lexical semantics of such verbs—because they subcategorize for an agentive participant, under reflexivization, the theme undergoer of the COS event must also be an agentive participant in the causing subevent, a kind of meaning not typically considered “anticausative” because, among other reasons, it is inconsistent with the *por sí solo* ‘by itself’ modifier. In §8.3.4 and §8.4.1, I explain what it is about *por sí solo* ‘by itself’ that leads to the behavior observed in (16) and (17).

The explanation for non-alternation with verbs like *cut* applies also to non-alternation with certain idiomatic senses of verbs that otherwise alternate. Brousseau and Ritter (1991:60), Levin and Rappaport Hovav (1995:85,105), and Van Voorst (1995) observe facts like those in (23) and (24) for English and (25) for French.

(23) a. She broke the vase/the window/the glass.
 b. The vase/the window/the glass broke.

(24) a. He broke his promise/the contract/the world record.
 b. *His promise/The contract/The world record broke.

(25) a. Jean a brisé sa promesse/l’accord/le record du monde/la routine.
 ‘John broke his promise/the agreement/the world record/the routine.’
 b. *Sa promesse/l’accord/le record du monde/la routine s’est brisé(e).
 ‘His promise/the agreement/the world record/the routine broke.’
 c. La fenêtre/la branche/sa montre s’est brisée.
 ‘The window/the branch/her watch broke.’ (Brousseau and Ritter 1991:60)

The observation is that while objects like vases, windows, branches, watches and glass can undergo a breaking event both as the object of a causative, as shown for English in (23a), and as the subject of an inchoative, as shown for English in (23b) and French in (25c), objects like promises, contracts, and world records cannot undergo a *breaking*-type COS event as the subject of an inchoative, as shown by the facts in (24b) and (25c). The generalization, according to Brousseau and Ritter (1991:60), Levin and Rappaport Hovav (1995), and Van Voorst (1995) is that promises, contracts, and world records can only be broken by agents—they cannot be broken by instruments, natural forces, etc. Under the proposed analysis, the sense of *break* in (24) and (25a,b), unlike the one in (23) and (25c), is one that requires an agentive causer. Because of this, for the same reasons that a verb like *cut* cannot anticausativize, idiomatic senses of *break* like the ones in (24) and (25a) cannot.

What has previously been only a descriptive observation, that only causative verbs with thematically underspecified subjects have inchoative variants, follows directly from the reflexivization analysis. The reflexivization operation can apply to both kinds of verbs—alternating and non-alternating transitives—but for verbs that specify of the participant of the causing eventuality that it be an agent, it can only be the case that the theme undergoer in the intransitive COS variant also has agent entailments, as was shown to be the case for verbs like *asesinar* ‘assassinate’. Because of this, reflexivized variants of fully specified verbs (e.g., *cut* and *assassinate*) have only reflexive interpretations available to them, while reflexivized versions of underspecified verbs (e.g., *break*) have anticausative interpretations available to them.[7]

8.3.2 Morphology

Out of all of the approaches to anticausativization discussed above, none offers a better explanation for the morphological marking on anticausatives than the reflexivization

[7] Underspecified verbs also have reflexive interpretations available, a fact discussed in §7.2.1, although such interpretations are generally disfavored due to the fact that most of the theme undergoer arguments are inanimate, and not possible agents. When the argument is construable as an agent, however, such an interpretation is available, as predicted by my analysis. This is discussed alongside data bearing out the prediction in §8.3.4.

analysis. As already discussed above, several of the analyses, like reflexivization, capture the morphological asymmetry between inchoative and causative in anticausative derivations. On all of the analyses that do capture this asymmetry, the explanation is that anticausativization is an operation deriving an inchoative verb from a causative verb, and the morphological mark appearing on the inchoative verb is somehow a morphological indicator of this derivational operation. The reflexivization analysis shares this with the other analyses that capture this fact—on reflexivization, the inchoative is derived from the causative by the application of a semantic operation of reflexivization on the latter in order to derive the former. In this way, the fact that the inchoative is morphologically marked while the causative is morphologically simple is captured.

Only the reflexivization analysis, however, has any explanation for why the morphological marker appearing on the inchoative in anticausative derivations is so commonly the same morphological marker used elsewhere in languages as a marker of reflexivity—on this analysis, anticausativization is indeed semantically reflexivization, of a kind that does not entail agentivity of the participant in the reflexivized relation. Because of this, the finding that reflexive and anticausative are very commonly marked morphologically identically is unsurprising. Indeed, on this analysis, this is expected. Recall the table from Haspelmath (1990) in (10), and repeated in (26).

(26) Other uses of anticausativizing morphology (Haspelmath 1990:36)

	reflexive	anticausative	passive	potential passive	fientive
Tigre	x	x	x		
Motu	(x)	x	x		
O'odham	x	x	x		
Mod. Greek	x	x	x	x	
Kanuri	x	x	x	x	
Margi	x	x	x	x	
Uigur		x	x	?x	?(x)
Udmurt	x	x	x		
Nimboran		x	x		x
Danish (*–s*)		x	x	x	
Latin (*r*)	x	x	x		(x)
Latin (*esse*)	x	x	x		
Mwera (*–k*)		x		x	x

Now, as shown by Haspelmath's table in (26), it is not the case that all languages that have anticausative markers have uses of that marker also as a reflexive. It is, nevertheless, the most common state of affairs—of the thirteen languages listed in Haspelmath's eighty language sample that have anticausative markers, in nine of these languages the marker also has reflexive functions according to Haspelmath. This seems extremely unlikely to be an accident. Despite this, however, none of the other analyses has any explanation for why this should be the case. The reflexivization analysis does—anticausativization *is* semantically reflexivization. I believe that morphological facts like the ones illustrated in (26) represent a strong argument in favor of the approach presented here.

Of course, something more must be said about the four languages in which anticausativization is marked by a morpheme that does not also synchronically serve as a marker of reflexivity. Can the analysis be extended to these languages as well? In order to say for sure, of course, much more detailed information would be needed about these languages, and such investigation is beyond the scope of the current work. Some speculation, however, does seem warranted. First, of course, it must be shown that in these languages anticausativization is indeed productive, as the MH is a hypothesis about the semantics of *productive word formation operations*, as discussed previously in Chapter 2. It could well be that in these languages, there is simply a morphological residue from what used to be productive anticausativization/reflexivization that has since simply been lexicalized as part of the lexeme's phonological shape.[8] Additionally, as I have shown above, the criteria for differenting between anticausative and passive are a bit tricky, and it could be that in these languages there is no motivation for distinguishing between the two—indeed, in three of the four languages there is also said to be a passive that is marked identically to anticausative, with the fourth having what Haspelmath calls a "potential passive" marked in the same way. So, it might be that once these languages are examined in more detail there is, in fact, no evidence for distinguishing between passive and anticausative. Finally, another possibility is that the right analysis for these languages is simply not reflexivization, but one of the other analyses of anticausativization discussed above. Almost all of these, as already discussed, are actually consistent with the MH. So long as it can be shown that one of the analyses other than deletion is the best analysis, no problem is posed for the MH. Thus, although these languages should be further investigated, I believe that there are enough possible explanations consistent with the MH, and further that the number of languages without the reflexive/anticausative syncretism is small enough, that there should not be cause for concern.

Nevertheless, we don't have to look far from this dissertation in order to find a language (a) without a passive and (b) with an anticausative that is not marked identically to the reflexive elsewhere in the language. Indeed, in Ulwa, as discussed in Chapter 5, the *–da–* and *–wa–* markers serve the function, among other things, of marking an anticausative operation, as illustrated by the data in (27) for the *–wa–* suffix.

(27) a. Arak-ki-bus bah-**w**-ida.
gun-<1SING> break-WA-3SING.PAST

[8] Such seems to be the case in Tongan (Churchward 1953, 1959), for example, where the intransitive *break*-type verbs commonly appear prefixed by *ma–*. See fn. 9 in Chapter 3 for further discussion of Tongan *ma–*.

'My gun broke.'

b. Wahai-ki arak-ki-bus bah-t-ida.
brother-1SING gun-<1SING> break-TA-3SING.PAST
'My brother broke my gun.'

Reflexivity in Ulwa, however, is marked with a completely different marker, *kal* 'self' (Green 1999:114), illustrated by the examples in (28).

(28) a. **Kal** makun-t-i tung man bahangh man yul-ma
REFL pathetic-TA-SS walk 2SING so 2SING word-2SING
amat-da-yang.
mourn-DA-1SING.PRES
'I feel sorry for you walking around suffering. (= lit. You are walking around feeling sorry for yourself, so I feel bad for you.)' (dict.)

b. Mâdi dislah yau waya îr-i **kal** daih-t-ing kau ...
now morning then little run-SS REFL hot-TA-1SING.PERF when
'This morning, when I went out running exercising (lit: warming self up) ...' (dict.)

c. Mâdi âka ripka yâ yam-t-ai, asna ahai-t-i
now this cold-ADJ 1SING.NON-NOM do-TA-3SING.PRES cloth bring-TA-SS
ya-a-tah; **kal** balak-d-uting.
1SING.NON-NOM-give-2IMP REFL wrap-DA-1SING.FUT
'This morning I'm cold. Give me a blanket and I'll wrap myself up.' (dict.)

Despite the fact that the marker of reflexivity, *kal*, is not the same marker of anti-causativization *–da/wa–*, I do not believe this actually argues against the reflexivization analysis of anticausativization for Ulwa. As it turns out the reflexive marker *kal* seems to be restricted to agentive environments, as evidenced by the (non-exhaustive) list of verbs in (29) with which it is attested in the Ulwa dictionary (Green 1999).

(29) *kal* verbs in the Ulwa dictionary (Green 1999)

kal auhnaka 'adjust one's appearance so as to make a particular attribute obvious'; kal amangnaka 'take care of oneself'; kal ânaka 'take a break, catch one's breath'; kal arandanaka 'curl up (of animate beings)'; kal âwanaka 'get married'; kal bahnaka 'compete'; kal balakdanaka/kal balaknaka/kal biriknaka 'wrap oneself up'; kal balisnaka 'embrace'; kal baunaka 'fight'; kal bilnaka 'quarrel'; kal buhnaka 'dry oneself off'; kal bulnaka 'go crazy'; kal dahnaka 'rest, relax'; kal dahnaka 'feel, to notice'; kal dahnaka 'recover from illness'; kal daihnaka 'exercise'; kal daknaka 'cut oneself'; kal dânaka 'break up; leave one another'; kal dasinaka 'engage in a dual of strength'; kal dimdanaka 'stretch one's limbs'; kal dimnaka 'stretch oneself to full length'; kal duluknaka 'soak oneself or each other'; kal kahwanaka 'smear on self' ...

What seems to be going on in Ulwa, then, is that *kal* has agentive entailments, which would preclude its use as a marker of anticausativization under the reflexivization analysis laid out above.[9] The *–da/wa–* markers, for their part, do not have agent entailments and can therefore serve as markers of anticausativization. More explicitly, what I am proposing is that while the denotation of *kal* in (30a) is just like the denotation of the anticausative *–da/wa–* markers in (31) in being a reflexivization operation, there is in addition a meaning postulate, something like (30b), which imposes the additional constraint that the single argument of a *kal* marked verb is always agentive.[10]

(30) a. $[\![kal]\!] = \lambda\mathfrak{R}\lambda x\lambda e[\mathfrak{R}(e,x,x)]$

b. meaning postulate: $\forall\mathfrak{R}\forall e\forall x[kal'(\mathfrak{R},x,e) \rightarrow AGENT(e,x)]$

(31) $[\![da/wa]\!] = \lambda\mathfrak{R}\lambda x[\mathfrak{R}(x,x)]$

According to Haspelmath (1987, 1990) anticausative markers develop diachronically

[9]To see why this is the case, consider why agentive COS verbs like *cut* cannot anticausativize on the reflexivization analysis. For the same reason, a reflexive marker with agent entailments also could not have anticausativizing functions on this analysis. See §8.3.1 for further discussion.

[10]I should point out, as evidenced by the data discussed in Chapter 5, that (31) is most likely not the only function of *–da/wa–* given the large number of deponents, i.e., marked intransitives lacking an unmarked transitive counterpart. As discussed in Chapter 5, this is almost always the case for what Kemmer (1993) calls "middle markers", other characteristics of which *–da/wa–* also display.

from reflexive markers via bleaching of agent entailments. If this is true, it may well be that *–da/wa–* at one point were markers of reflexivity whose reflexive function has since been overtaken by another marker, *kal*, with agent entailments. Indeed, as previously noted in Chapter 5, the set of *–da/wa–* verbs is not completely without verbs naming reflexive events, as shown e.g., by the verbs in (32).

(32) Some reflexive *–wa–* verbs
kahwanaka 'paint/anoint self'; nakawanaka 'wound self'; purawanaka 'wet self'

Further, it is worth noting that the Ulwa reflexive marker *kal*, the reflex of which is also a marker of reflexivity in Mayangna according to Norwood (1997), aside from its reflexive meaning can be glossed in both Ulwa and Mayangna as 'foot/leg.' This sense of *kal* is illustrated by the data in (33).

(33) Kal-ki dala-p-ai.
foot/leg-1SING pain-PA-3SING.PRES
'My foot/leg hurts.'

Faltz (1985) and Schladt (2000) note that words that become reflexive pronouns often begin life as words with body-part denotations (see also Beavers and Koontz-Garboden 2006). The fact that the Ulwa reflexive marker *kal* still has such a meaning, suggests that this word may have only relatively recently taken on a reflexive meaning. Further evidence for this conjecture is the fact that in Miskitu, a somewhat more distant Misumalpan relative of the Sumu languages Ulwa and Mayangna, the reflexive markers are *wina* 'meat/body' in the objective case and *silp* 'self', neither of which appears to be cognate with the Sumu counterpart. The fact that the reflexive markers are different in the Miskitu and Sumu sub-branches of Misumalpan suggests that in the relatively recent history of Misumalpan, for whatever reason, the languages have each acquired new reflexives. Further support for this claim comes from the nature of the reflexive markers in Miskitu, where *wina* 'meat/body' also names a kind of body part, namely the whole body, and where *silp* 'self' is a borrowing from English Creole, showing that this latter marker is no more than a few hundred years old, given the history of contact between the English, English Creole speakers, and the Miskitu since colonization (Holm 1978; Green 1999; Benedicto and Hale 2000). This further supports the idea that these agent-oriented reflexive markers are a relatively recent development in Misumalpan.

This idea, of course, is speculative, and requires further investigation of a comparative nature. Such investigation, it turns out, will likely have to go beyond Misumalpan, since the reflexes of *–da/wa–* in Miskitu (CIDCA 1985:112) and Mayangna (Norwood 1997:Chapter 5) seem to have similar functions as the Ulwa markers. Nevertheless, the preliminary evidence as discussed above does indeed seem to point in the direction of the agent-oriented reflexive markers in the Misumalpan languages being relatively new, suggesting that the functions that they serve may have replaced agent-oriented reflexive uses of some other marker, by hypothesis *–da/wa–* and their reflexes.

Summing up this section, then, I have shown that morphologically, the reflexivization analysis of anticausativization is extremely plausible. On this analysis it is obvious why the morphological markers of anticausativization are indeed the ones that they are—anticausativization is a kind of reflexivization operation, and it therefore makes sense that the operation should be marked by morphology serving the function of reflexive marking elsewhere in the language. Competing analyses fail to capture the fact that it is not just any bit of morphology that tends to mark anticausativization crosslinguistically, but in the majority of languages a morphological marker that also serves the purpose of reflexive marking, and indeed it may well be the case that anticausative markers, even when they are not also used for reflexive marking synchronically, come diachronically from a previous reflexive marker via semantic bleaching, specifically via loss of agent entailments. Although further research is needed, this kind of process was hypothesized to have taken place in the Misumalpan languages, explaining why it is that synchronically the morpheme marking anticausativization is not the same one that marks reflexivity with agentive NPs.

8.3.3 Non-alternation II: Inchoatives without causatives

As discussed in §7.2.4, not only do languages have causative verbs lacking anticausative variants, but they also generally have inchoative verbs that lack causative variants, as illustrated for Spanish by the data in (30), repeated in (34).

(34) a. El rosal floreció.
the rose bush bloomed
'The rose bush bloomed.'

b. *El jardinero / La primavera / El abono floreció el rosal.
the gardener / the spring / the fertilizer bloomed the rose bush
'*The gardener / the spring / the fertilizer bloomed the rose bush.'
(Mendikoetxea 1999b:1598)

One explanation of non-alternation for verbs like *florecer* 'blossom' in (34) relies on the idea that anticausativization is the only derivational process available in grammars to effect the causative/inchoative alternation. This is the view of Levin and Rappaport Hovav (1995), for example. On this view, the verb *florecer* 'blossom' is simply lexicalized as a verb denoting a non-causative COS event. It is this fact combined with the lack of a process of causativization that combine to make things such that there is a non-causative use of this verb (34a), but no causative use (34b).

Recent research by Wright (2001, 2002) and McKoon and Macfarland (2000, 2002), however, has called this analysis into some question. They find that at least in English, it is indeed the case that causative uses of verbs like *blossom* can be found, but these uses have special properties, e.g., they never appear with agentive causers. I believe that this is an area that requires much more research. Fortunately, it does not bear on the analysis of anticausativization presented here—instead, I believe what their results suggest is that contrary to Levin and Rappaport Hovav (1995), there do exist productive processes of causativization, but that its nature is not yet well understood. As already discussed previously, causativization, while an interesting phenomenon, is not one that poses any challenge to the MH. Because of this, I don't go into this issue any further here.

8.3.4 On the differences between anticausative and passive

As previously noted, among the major facts that any analysis of inchoative verbs needs to deal with, whether derived via anticausativization or not, is the fact that they behave differently from passives of their causative counterparts in certain well-known ways. Setting aside use with oblique arguments, since as shown in §8.4.4 this issue is not as straightforward as has previously been presented, the two big contrasts are in (a) the ability to take agentive modifiers and (b) the ability to take *by itself* modification. These contrasts are illustrated for English by the data in (35) and (36) respectively.

(35) a. *The boat sank to collect the insurance.
b. The boat was sunk to collect the insurance (Roeper 1987, attributed to Manzini 1983)

(36) a. The boat sank by itself.
b. *The boat was sunk by itself. (Chierchia 2004)

The data in (35) show that while an inchoative verb (35a) cannot control into a purpose clause, a passive verb (35b) can. This is generally taken as an argument that the argument of a passive that corresponds to the subject of an active verb, even when not overtly present, as in sentences like (35b), still has some kind of syntactic reality. This contrasts with the situation for the inchoative verb (35a)—the argument corresponding to the subject of the related causative verb seems not to be syntactically present, at least so far as control into purpose clauses is concerned. The *by itself* diagnostic also demonstrates a contrast between the two kinds of verbs—while *by itself* can be bound by the single argument of the inchoative verb (36a), it cannot be bound by the single argument of the passive verb (36b). The same contrasts hold between passives and inchoatives overtly derived via anticausativization, as shown by the Spanish data in (37) and (38), repeated from §7.2.1.[11]

[11] In (37a) Mendikoetxea (1999b) includes the adverbial *por sí sola* ‘by itself’ in order to distinguish the passive interpretation of the *se* derived verb, for which it seems that it must be possible to control into a purpose clause, from the anticausative, for which it is not.

(37) a. *La puerta se abrió por sí sola para airear la habitación.
the door REFL opened by REFL only to air the room
'*The door opened by itself to air out the room.'
b. La puerta fue abierta para airear la habitación.
the door was opened to air the room
'The door was opened to air out the room.' (Mendikoetxea 1999b:1592)

(38) a. *El barco fue hundido por sí solo.
the boat was sunk by SELF only
'*The boat was sunk by itself.'
b. El barco se hundió por sí solo.
the boat REFL sank by SELF only
'The boat sank by itself.' (Mendikoetxea 1999b:1594)

In the following paragraphs, I offer an explanation for these contrasts in the context of the reflexivization analysis of anticausativization.

Concerning control into purpose clauses, I start by clarifying what I believe the nature of passives is. Here, my assumptions are rather standard, I believe, at least within lexicalist frameworks.[12] Following Grimshaw (1990), Levin and Rappaport Hovav (1995, 1998), Sadler and Spencer (1998) and others, I assume a distinction between a word's lexical semantic representation (LSR) and its argument structure (AS). The lexical semantic representation includes syntactically relevant thematic information, which on my analysis comes in the form of a decompositional representation. The argument structure is projected from the lexical semantic representation and includes no thematic information, instead having only information about how many arguments the word takes and whether they are external or internal and if internal, direct or indirect (Levin and Rappaport Hovav 1995:20ff).[13] While I take anticausativization to be an operation on

[12]That I lay out my assumptions within a lexicalist framework here should not be taken as a sign that a non-lexicalist approach could not equally well capture the difference. I simply don't develop such an analysis here.

[13]The argument structure may also take an event position (Higginbotham 1985; Grimshaw 1990; Levin and Rappaport Hovav 1995). Whether it does or not is immaterial in the discussion that follows, and I therefore leave it out of the representations.

the lexical semantic representation of a verb, as developed in detail above, passive I take to be an operation at the level of argument structure that suppresses the external argument, with the result that its projection into the syntax is no longer obligatory, and when it does appear, it is no longer case marked by the verb, but must be case marked by an oblique marker (Grimshaw 1990:Chapter 4).

With this much as background, consider now how the contrast between passive and derived inchoative arises in Spanish for a verb like *abrir* 'open' as illustrated in (37). This verb in its morphologically simple active form is a causative, as already discussed above, and as such its lexical semantic representation and argument structure are as in (39).

(39) Lexical semantics and argument structure for active *abrir* 'open'

LSR $\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, y) \wedge BECOME(e, s) \wedge THEME(s, x) \wedge open(s)]]$

AS $< x < y >>$

Kim (x) opened the door (y).

As illustrated in (39), *abrir* 'open' in its morphologically basic active transitive form has two arguments in its LSR. One is the theme undergoer of the COS event. The other is thematically underspecified, a position well-argued for in previous literature, as discussed above, and which can be seen on the basis of data like those in (6). In this way, then, the actual thematic nature of the causer argument is in large measure a result of the semantic nature of the NP filling this (thematically underspecified) role—if it is human, for instance, it is likely to give rise to an agent interpretation, but will not give rise to an agent interpretation if the argument is not animate (as with natural forces).

The passive of *abrir* has exactly the same LSR as the active. The difference between active and passive is, as described above, in the argument structure—in the passive, the external argument is suppressed, being usable only as an oblique, but not as a direct argument. This operation, however, has no impact on the LSR of the verb, which, as already mentioned, remains identical to that of the active, as illustrated in (40).[14]

[14] I assume that the same state of affairs holds for the passive interpretation of *se* derived verbs.

(40) Lexical semantics and argument structure for passive *fue abierto* 'was opened'

LSR $\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, y) \wedge BECOME(e, s) \wedge THEME(s, x) \wedge open(s)]]$

AS $<(x)<y>>$

The door (y) was opened (by Kim (x)).

The important point for the purpose of dealing with data like those in (37) is that the passive, like the active, has two distinct arguments in its LRS, one the undergoer of the COS event, the other the causer. These are both projected to the argument structure, with the passive operation suppressing the external argument, so that its appearance is only optional, and as an oblique when it does appear. Nevertheless, even if the external argument is not overtly present, it is semantically present as an argument distinct from the undergoer argument. Returning now to the data in (37), the observation is that a purpose clause is acceptable with a passive verb, the oblique (or null) argument controlling into the purpose clause with an agentive interpretation. Purpose clauses like the ones in (37) require an agentive controller. As already discussed, the LRS for both active and passive verbs has a thematically underspecified causer that permits agentive interpretations. Because of this, the suppressed external argument in passives, which is the causer in the LRS, can control into purpose clauses, i.e., because it allows for an agent interpretation, required by the controller of the purpose clause.[15]

[15] A larger question about these facts is what it is about the syntax of the passive construction that makes it such that the unexpressed formerly external argument has the syntactic properties required in order to control into a purpose clause. Here there are two questions. The first concerns its thematic properties, and how it is that it can have an agent interpretation. This question I have addressed above. A second, important, but tangential question regards the syntax of this argument, and how it is that an unexpressed argument can be a controller. Because this does not have direct consequences for the MH, I do not develop it in detail here. There is one idea that suggests itself, though, that is worth mentioning. Observe that the LSR of the passive, like that of its transitive/active counterpart, has two lambda abstractors that must be saturated. This could be what guarantees the syntactic presence of the *by* phrase in passives even when they are not phonologically present, i.e., the fact that even when phonologically absence its syntactic presence is still observable in e.g., control contexts. Were it not syntactically present, as a syntactically present null argument, there would be no argument to saturate the second lambda abstractor in the passive verb's LSR, and semantic composition would therefore encounter problems. If, however, the *by* phrase of passives is syntactically present even when phonologically absent, there could be a null argument in the syntax for the verb to compose with. Compare this to the LSR for an anticausative, as in (41), which has only one lambda abstractor, and which therefore would not be able to compose semantically with a (second) implicit argument.

In anticausativization, by contrast with passivization, the reflexive operator *se* in (10) takes the causative lexical semantic representation of the causative verb as an argument to yield a derived inchoative with the lexical semantic representation (41). This representation has a single argument which is a participant in both the causing and the COS subeventualities.

(41) Lexical semantics and argument structure for anticausativized *abrirse* 'opened'

LSR $\lambda x \lambda s \lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, x) \wedge BECOME(e, s) \wedge$
$THEME(s, x) \wedge open(s)]]$

AS $< x >$

The door (x) opened.

Just as with the active verb, the semantic nature of the NP determines what the thematic nature of the causer participant will be, the same is true in the anticausative, since the causer participant is still partially underspecified. Since the causer participant and the undergoer of the COS event are specified by the LSR to be the *same participant*, this participant must at least have the THEME properties specified by the LRS of the verb of the undergoer of the COS event. To the extent, though, that the verb names an event of a kind that the theme undergoer could actually be animate, and thus potentially agentive, it is predicted that this single argument could have not only the theme entailments specified of the undergoer of the COS event, but also agent entailments. As a consequence, such an argument would be predicted to be able to control into purpose clauses (cf. Chierchia 2004:39). Because most COS verbs are such that the undergoer of the COS is almost always inanimate, and therefore not a possible agent, this is rarely found. There are, however, some alternating COS verbs, like *ahogar* 'drown', that take animate undergoers, as exemplified by the naturally occurring transitive/causative and derived inchoative examples in (42) and (43).

(42) a. Jurado declara inocente a mujer que ahogo a sus 5 hijos.
Judge declares innocent to woman that drowned to her 5 children
'Judge declares innocent the woman who drowned her five children.' (newspaper headline; Google)

b. Un hombre ahogó a su hija de seis meses de edad.
one man drowned to his daughter of six months of age
'A man drowned his six year old daughter.' (Google)

c. La madre acusada de ahogar a sus dos hijos ...
the mother accused of drowning to her two children
'The mother accused of drowning her two children ...'(Google)

(43) a. Un chico de 13 años se ahogó cuando nadaba en una cava
one kid of 13 years REFL drowned when was swimming in a cave
'A 13 year old boy drowned while swimming in a cave ...' (Google)

b. Se ahogó un nene de tres años al caer a un desagüe.
REFL drowned one baby of three years the falling into a sewer drain
'A three year old baby drowned when s/he fell into a sewer drain.' (Google)

As illustrated by the derived inchoative examples in (43), the single argument of a drowning event is animate, usually human, and therefore of a kind that could be agentive, and therefore a possible controller of a purpose clause. The present analysis, then, predicts that derived inchoatives of such verbs should, in fact, be acceptable with the single argument controlling into the purpose clause, to the extent that it is agentive. This is, of course, very different from the implicit argument of the passive verb controlling into the purpose clause, since (a) this argument is covert, and (b) it is completely distinct from the undergoer of the COS event named by the passive verb. Nevertheless, this prediction is worth highlighting, and such examples, while rare, presumably because theme undergoers of most COS verbs are such that they cannot typically be agentive, can indeed be found with anticausativized verbs like *ahogarse* 'drown (intrans).[16] This is shown by the data in (44).

[16]See also relevant discussion of English inchoatives like *die* in examples involving religious martyrdom (Van Valin and Wilkins 1996:312–313; Levin and Rappaport Hovav 2005:178).

(44) a. Y aquel día, hace tres años, cuando Phil se ahogó para
and that day from three years when Phil REFL drowned to
salvarle la vida a Jim . . .
save-3SING the life to Jim
'And on that day, three years ago, when Phil drowned (himself) to save Jim's life . . . ' (Google)

b. . . . casi se ahogó para que no pudieran ver-la, y así pudo
almost REFL drowned to that no able see-3SING.FEM and like able
salvar-se.
save-REFL
'. . . she almost drowned herself in order that they not be able to see her, and in this way, she was able to save herself.' (Google)

c. . . . como el joven que se ahogó para salvar a una
like the youngster who REFL drowned to save to an
desconocid-a . . .
unknown-FEM
'. . . like the youngster who drowned (self) to save an unknown woman . . . ' (Google)

Turning now to the facts in (38), repeated in (45), what is special about reflexive modifiers like *por sí solo* 'by itself', according to Chierchia (2004), is that they must be bound in the syntax by an argument that is the sole cause of the COS event.

(45) a. *El barco fue hundido *por sí solo*.
the boat was sunk by SELF only
'*The boat was sunk by itself.'

b. El barco se hundió *por sí solo*.
the boat REFL sank by SELF only
'The boat sank by itself.' (Mendikoetxea 1999b:1594)

Semantically, this means that *por sí solo* 'by itself' must have a denotation something like (46).

(46) $[\![\text{por sí solo}]\!] = \lambda P \lambda x \lambda e[\exists e' \forall y[P(x, x, e) \wedge CAUSE(e', e) \wedge EFFECTOR(e', x) \wedge EFFECTOR(e', y) \rightarrow y = x]]$

The idea expressed by (46) is that *por sí solo* 'by itself' has as part of its denotation that there is a sole causer, i.e., that an event *e'* causes an event *e* of Ping (P a variable ranging over the meaning of intransitive verbs) in which *x* is the sole EFFECTOR participant in the causing event *e'*. In addition, *por sí solo* 'by itself' must have syntactic constraints that are independent of the lexical semantic representation in (46); specifically, it must be locally bound by a subject (cf. Chierchia's 2004 discussion of Italian *da sé* 'by itself'). The syntax and LSR of a passive verb, however, are inconsistent with these constraints—the subject binding it is not the sole cause of the subevent. Indeed, it is not a cause at all, and sentences such as (45a) are therefore unacceptable. In the denotation of the derived inchoative in (45b), given in (12), by contrast, the undergoer of the COS event is also the EFFECTOR in the causing subevent. Further, the NP naming both the undergoer and the sole cause is a subject and locally binds *por sí solo* 'by itself' in sentences such as (45b). Derived inchoatives, thus, meet both the semantic and syntactic constraints on use with *por sí solo* 'by itself', while passives do not, the latter specifically being in violation of the binding theoretic properties of *por sí solo* 'by itself', which must be locally bound by a subject NP naming the EFFECTOR participant in the causing subevent.

In this way, then, the reflexivization analysis of anticausativization accounts for widely observed differences between passives and anticausatives.

8.3.5 Inferential relationship between causative and inchoative

One of the core semantic benchmarks for analyses of the causative/inchoative alternation, as already discussed in §7.2, has been the ability to account for an apparently inferential relationship between sentences with a causative and sentences with a corresponding inchoative. Specifically, the received wisdom, which has gone almost entirely unchallenged in the literature (though see Wierzbicka 1980:172 for suggestive English data) is that there is an entailment relationship from causative to inchoative, such that, for example, if a sentence with a causative like (47a) is true, then the sentence with the corresponding inchoative, e.g., (47b), will also always be true.

(47) a. Kim broke the vase.
b. The vase broke.

Without laying any claim to exactly what the facts of English are, I believe that in languages with overt unambiguous anticausativization, they are significantly more complicated than has been presumed. In fact, the bulk of work on the causative/inchoative alternation, I believe, has simply assumed that the entailment relationship between causative and inchoative presumed to hold in English also holds in cases of anticausativization.[17] In this section I argue that this is not the case and then go on to show that this fact is captured by the reflexivization analysis, while it is not captured by competing analyses.

The clearest piece of evidence for this is that contexts can be found in which the causative can be asserted while the inchoative is still denied. This is illustrated by the naturally occurring data in (48).

(48) `es.charla.moteros`, Nov. 4, 2003, posted by "Wanchuzri"
> menos mal que la wanchu no puede leer esto ...
'thank goodness that Wanchu(zri) can't read this ...'
> el otro dia se le rompió el ordenador ... :-/
'the other day her computer broke on her ...'
Oye, niñato, que ya si te leo y el ordenador **no se rompió** sino que me lo rompiste TU!
'Listen, Niñato, now I do read your message, and the computer didn't *break*, but rather you broke it on me!'

[17]I say *presumed* here, because English data discussed in Wierzbicka (1980:172) suggest that this entailment relationship also may not hold in English. I leave this aside, however, given the fact that English lacks unambiguous anticausativization, and therefore does not bear directly on the discussion in this chapter.

What the writer is asserting in (48) is that the computer was not the cause of its own breaking; instead, there was a cause external to the computer, namely the previous poster. Thus, the writer is denying the truth of the inchoative while asserting the truth of a causative.[18] A related constructed example is given in (49).

(49) Father: ¿Que pasó, hijo?
'What happened, child?'
Son: El vaso se rompió.
'The glass broke.'
Father: **No se rompió** sino que tú lo rompiste!
'The glass didn't *break*—you broke it!'
→ **The glass broke.**

Like the example in (48), in (49) the truth of the sentence headed by the derived inchoative is explicitly denied, at the same time that the truth of a sentence headed by a causative is asserted, showing that contrary to what seems to generally be assumed, it is not the case that a sentence headed by a causative entails a sentence headed by the corresponding inchoative.

The reflexivization analysis of anticausativization developed above actually predicts precisely this kind of relationship between causative and inchoative. This can be seen simply by considering the decompositional representations assigned by this analysis to causative *break* in (50) and to its derived inchoative counterpart in (51).

(50) $[\![romper]\!] =$
$\lambda x \lambda y \lambda s \lambda e[\exists v[CAUSE(v, e) \wedge EFFECTOR(v, y) \wedge BECOME(e, s) \wedge THEME(s, x) \wedge not\text{-}whole(s)]]$

[18]Using Google, Beth Levin came across a comparable naturally occurring Italian example, given in (i), which illustrates exactly the same point.

(i) la diatriba l'hai aperta tu, non si e aperta sola, attacando per un tuo infantile capriccio chi non aveva rivolto nemmeno un piccolo accenno alla tua Peloro Truffa
you opened (started) the diatribe; it didn't start by itself ...
`http://www.ngmail.it/forum.nsf/($Messaggi)/F619A60E976C1C8DC125713F003E3BF0?OpenDocument`

(51) $[\![romper\ se]\!] = \lambda z \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge EFFECTOR(v,z) \wedge BECOME(e,s)$
$\wedge THEME(s,z) \wedge not\text{-}whole(s)]]$

According to the analysis of derived inchoatives laid out above, while every COS event named by a derived inchoative verb is one in which the entity undergoing the COS event is one in which that same entity was a participant in the causing eventuality, this is distinctly *not* the case for COS events named by underived causative verbs. These events are ones in which the undergoer of the COS event and the participant in the causing COS event can be distinct. Thus, it follows from the representations assigned to causatives and derived inchoatives that one should be able to find contexts in which a sentence headed by a derived inchoative verb is true even though a sentence headed by the corresponding underived causative is false. This is precisely the kind of context illustrated by the data in (48).

At least for cases of anticausativization, then, the proposed analysis predicts, contrary to orthodoxy, *that sentences headed by a causative do not entail sentences headed by a corresponding inchoative*. I believe the data in (48) suggest that this prediction is correct. If we are to take the reflexivization analysis seriously, however, it should actually be the case that infelicity arises in any context where inchoative is asserted and a continuation asserts the truth of a sentence headed by a causative with an effector that is distinct from the undergoer of the COS event. This is illustrated by the data in (52).

(52) Se rompió el vaso. De hecho, Juan lo rompió.
REFL broke the glass in truth Juan it broke
'The glass broke. In fact, Juan broke it.'

The three native Spanish speakers I have consulted have differing opinions as to the felicity of (52). While one claims that it is infelicitous, the other two find it unexceptional. This sort of difference of opinion for (52) is actually predicted by the analysis proposed here, since as discussed at length above, *se* marked verbs can have not only anticausative interpretations, but passive interpretations as well. My analysis predicts that (52) should be acceptable on a passive interpretation, but unacceptable on an anticausative interpretation. As discussed in previous sections, the only way to unambiguously force an anticausative interpretation with a *se* derived verb in Spanish is to add the adverbial modifier *por sí solo* 'by itself'. As the data in (53) shows, when this is added to (52), forcing an anticausative interpretation, the result is a clear infelicity.

(53) #Se rompió el vaso por sí solo. De hecho, Juan lo rompió.
REFL broke the glass by SELF only in truth Juan it broke
'The glass broke by itself. In fact, Juan broke it.'

What this shows, then is that the facts are indeed consistent with the reflexivization analysis, and that at least in cases of clear unambiguous anticausativization, contrary to what is generally presumed in the literature, causative does not entail inchoative.[19] Instead, the reverse seems to be the case—inchoative entails a special kind of causative, namely one in which a single entity acts upon itself to cause a change of state in itself.[20]

8.3.6 The spontaneity implication of inchoatives

The proposed analysis, like most discussed above, also straightforwardly captures the frequently commented upon implication that inchoative gives rise to an inference that there is no external cause. On this analysis, there is no causer external to the undergoer of the COS event responsible for causing the COS event. Indeed, the causer is the undergoer itself.

8.3.7 Reflexivization, anticausativization, and diachrony

An additional attribute of the reflexivization analysis of anticausativization not shared by any other analysis of anticausativization that does not treat the process semantically

[19] In this way, then, I believe that Chierchia's (2004:54ff.) efforts at revising the reflexivization analysis to predict an entailment from sentences headed by a causative to sentences headed by an inchoative may be misguided, at least for languages with overt anticausativizatioin (unlike English, his language of primary analysis). As shown here, the facts appear to be more complicated.

[20] An interesting topic for future research would be the extent to which continuations like the one in (52) are acceptable in languages that have productive anticausativization, but lack passive. To the extent that such languages exist, the prediction would seem to be that such sentences should be infelicitous. As previously discussed above, Ulwa may be one such language, though this requires further investigation.

as a reflexivization operation is that it offers a straightforward and plausible diachronic account for how markers of anticausativization develop from markers of reflexivization.

In his discussion of the diachronic development of passive markers, Haspelmath (1990) observes that in developing from reflexive markers, an anticausativization stage seems always to be passed through. Along the way he also lays out an explanation of how it is that anticausative markers develop from reflexive markers.

> The semantic mechanism of the transition from reflexive to passive via anticausative seems well-understood and is clearly an instance of semantic bleaching. The main difference between reflexive and anticausative is that the latter is mostly non-agentive (Haspelmath 1990:44).

More specifically, what Haspelmath proposes is that "... dropping the agency restriction on reflexives automatically leads to anticausative uses." Citing Lakoff (1971:158) and Geniušienė (1987:200ff.), he observes that hints of this process can be seen with English reflexives. The sentence in (54), due to Lakoff (1971), is ambiguous between an agentive/reflexive type interpretation (54a) and a non-agentive/inchoative type interpretation (54b).

(54) John hurt himself.
  a. John acted willfully.
  b. John was an unwitting participant. (Lakoff 1971:158; Haspelmath 1990:44-45)

Haspelmath's claim is that what is happening with the English reflexive in examples like (54) is that the reflexive pronoun no longer obligatorily has agent entailments.[21]

[21] This assertion is supported not only by facts like those in (54), but also by the fact that reflexive pronouns in English can appear with transitive verbs which do not entail agency of the external argument, as e.g., in (i).

(i) a. Kim knows herself well.
  b. Sandy sees himself in the mirror.
  c. Joe hates himself.

It seems, then, that the reflexive pronouns in English are polysemous, having both the lexical entry in (55)

As I have analyzed anticausativization above, it is simply reflexivization without agent entailments, exactly as proposed by Haspelmath, so that on my analysis, the lexical semantics of a normal reflexive are as in (55a) with the associated meaning postulate in (55b), while the lexical semantics of a "bleached" reflexive, i.e., an anticausative marker, are as in (56).[22]

(55) Lexical semantic representation of reflexive

a. $\lambda\mathfrak{R}\lambda x\lambda e[\mathfrak{R}(e, x, x)]$

b. meaning postulate: $\forall\mathfrak{R}\forall e\forall x[kal'(\mathfrak{R}, x, e) \rightarrow AGENT(e, x)]$

(56) Lexical semantic representation of anticausative marker

$\lambda\mathfrak{R}\lambda x[\mathfrak{R}(x, x)]$

The progression from (55) to (56) can be exactly as described by Haspelmath, a straightforward case of semantic bleaching, whereby the development of an anticausative marker from a reflexive marker is, diachronically, simply the loss of the agentivity meaning postulate in (55b), resulting in the lexical semantics in (56) for anticausativization. It is worth recalling here that what is being observed is a loss of entailments at the lexical semantic level, and therefore may initially appear as a problem for the MH. The MH, however, is a *synchronic* constraint on productive word formation operations, while the process under discussion is a *diachronic* one, with a locus in a single isolated lexeme. This kind of diachronic semantic bleaching, with a locus in particular lexemes is widely observed in the literature on semantic change (Bybee 1985; Bybee *et al.* 1994), and is perfectly consistent with the MH.

Now, there are a couple of questions that might be raised with respect to the data in (54) that are worth pursuing in a bit more detail.[23] First, if the sentence in (54)

and in (56), with the latter the denotation of the reflexive pronouns appearing in (i) and in (54) on the inchoative interpretation.

[22]Cf. the discussion of the Ulwa *kal* and *–da/wa–* markers in §8.3.2.

[23]The discussion that follows is predicated on the assumption, argued for by Levin and Rappaport Hovav (1995) for example, that anticausativization is the right analysis of the causative/inchoative alternation in English. As I have discussed previously, this is not unambiguously the case, since English lacks the relevant morphology. Further, recall that causativization poses no problems for the MH. In what follows, then, for English, I am assuming a kind of worst case scenario, i.e., that anticausativization is the right analysis of the English causative/inchoative alternation.

is ambiguous between a true reflexive and a true inchoative (via anticausativization) interpretation, why is (57) unacceptable?

(57) * Kim hurt.

Secondly, with verbs that do have inchoatives, unlike *hurt*, why is the reflexive consistently interpreted with agency entailments? More specifically, why does (58) have only the anthropomorphic interpretation in (58a), but not the normal inchoative interpretation in (58b)?

(58) The vase broke itself.

  a. The vase acting willfully broke itself.
  b. *The vase broke.

I believe what is going on here may have to do with blocking (Kiparsky 1973; Andrews 1990). First, with respect to (57), it is worth noting that *hurt* does have an intransitive use, but as a state verb, rather than as a COS verb, as illustrated in (59).

(59) Kim's arm hurts.

At the same time, note that the causative use of *hurt* illustrated in (57) is like alternating verbs in that the causer seems to be semantically underspecified. I.e., the subject needn't be agentive, as illustrated by the naturally occurring sentences in (60) with an eventive subject (60a), an instrument subject (60b), and a natural force subject (60c).

(60) a. The fall hurt him quite a lot more than just physically. (event; Google)
  b. She did not connect, and the hammer hurt her thumb real bad. (instrument; Google)
  c. How much did the hurricane hurt your home? (natural force; Google)

What this suggests, then, is that normal anticausativization of the causative *hurt* may be blocked by the fact that there is a pre-existing stative intransitive verb *hurt*. Because of this, an inchoative meaning is available for (54)—this periphrastic reflexive is filling in the gap caused by the unavailability of *hurt* with an inchoative use due to its pre-existing stative meaning as an intransitive. At the same time, the inchoative meaning with the periphrastic reflexive would be blocked for verbs like *break* by the normal synthetic inchoative (synthetic tends to block analytic—Andrews 1990; Kroch 1994; Koontz-Garboden 2004; Kiparsky 2004), formation of which is not blocked by the pre-existence of a stative intransitive sense for *break*. The same explanation applies to Chierchia's (2004:54, fn. 13) *The boat sank* versus *The boat sank itself*, for which he lacks an explanation.

Consider also the verb *cut*. What I've said up until now about such verbs is that their lexical semantics is such that the participant in the causing subevent is specified to be agentive, which prevents it from having an anticausative interpretation under reflexivization. Nevertheless, it seems to me that an example like (61), in the spirit of the example in (54) is acceptable with a non-agentive interpretation.

(61) Quick, get someone! Little Johnny cut himself!

While (61) could certainly have an agentive interpretation, it seems to me that a non-agentive, more inchoative-like interpretation is also possible. My analysis predicts that this should be possible only to the extent that the verb *cut* is becoming bleached, losing the agent entailments of the participant in the causing subevent. If this is indeed happening, then it would be expected that transitive/causative examples of *cut* could be found with non-agentive, more natural force, or event type causers. Contrary to what is generally claimed in the literature for *cut*, it seems that such examples can be found, e.g., (62).

(62) Torpedoed by the German submarine UB6 off Galloper Light Vessel, the torpedo explosion cut the vessel in half and she sank rapidly. (Google)

To the extent that this is indeed possible, as it appears to be, my analysis further predicts that true inchoatives (anticausatives) should be possible with *cut*, since if the participant in the causing subevent is not fully specified, it is predicted that reflexivization can give rise to anticausative type meaning. Again, contrary to what is generally claimed in the literature, this seems to be the case, as shown by the data in (63), examples collected with Google by Malka Rappaport Hovav.

(63) a. The figure lurched, but didn't fall. I hadn't severed the rope. With another yell, I struck it again. The rope cut cleanly.
b. He heard one poor fellow get delirious when the rope cut and strangled him, and talk to his mother all night long, begging her not to hug him so hard, for she hurt him.
c. Knowing he was near rope end he held tighter and the rope cut on the rock releasing Rod on down the mountain.

The upshot is that my analysis links diachronic semantic bleaching to change in diathesis. What seems to be happening with *cut* is that it is, presumably over time, bit by bit, losing the agent entailments on the participant in the causing subevent. As this happens, this has consequences for the morphosyntactic behavior; in particular, it can anticausativize precisely in the way predicted for a verb with a causer of underspecified thematic nature.

As discussed in §7.2.3, a reasonable additional constraint on a formal semantic analysis of anticausativization is that it be linkable to a plausible account of the diachronic development of the markers of this function.[24] The analysis of anticausativization I have proposed in this chapter is the only such analysis in the literature.

8.3.8 Formalizability

A final item worth mentioning is that the reflexivization analysis of anticausativization, as already laid out above, has been relatively easily formalized in a compositional semantics. As I discussed in §7.2, I do not believe that formalizability *ipso facto* argues in favor of one particular analysis over another, but I do believe that there should be some cause for suspicion in cases where, as with the deletion analysis, a formal analysis has never been given, and where, as with the deletion analysis, it in fact would not be possible to give a formal analysis with nothing more than relatively standard assumptions.

[24] See also Deo (2006) on the sychrony and diachrony of the semantics of the perfect in Indo-Aryan.

8.4 Arguments for a CAUSE in derived inchoatives

In the preceding sections, I have developed a reflexivization analysis of anticausativization on which inchoative verbs derived by anticausativization retain in their lexical semantic representation the CAUSE operator present in the representation of the causative verb from which they were derived. I have shown this to be not only a plausible analysis of anticausativization, but also one that captures a wide range of facts surrounding the phenomenon that I believe no other analysis either has sought to capture, or actually can handle.[25] From the perspective of the MH, the most crucial aspect of this analysis is the fact that the CAUSE operator is actually present in the LSR of the derived inchoatives. Because so much hinges on this particular aspect of the analysis, it would be nice to be able to give independent empirical arguments for this particular aspect of the analysis. In fact, I believe there are such arguments, several of which I lay out in this section. The conclusion to be taken away from this discussion is that it is not only plausible that derived inchoatives have a CAUSE operator as part of their LSRs, but there are, in fact, empirical arguments leading directly to this conclusion. If the MH is right, of course, things could not have been any other way.

8.4.1 The Italian *da sé* and Spanish *por sí solo*

As discussed in §7.2.1, the Spanish adverbial modifier *por sí solo* 'by itself' distinguishes anticausative interpretations of *se* derived verbs from passive interpretations of the same verbs. This contrast was illustrated by the data in (13), repeated in (64).

(64) a. *El barco fue hundido *por sí solo*.
the boat was sunk by SELF only
'*The boat was sunk by itself.'

b. El barco se hundió *por sí solo*.
the boat REFL sank by SELF only
'The boat sank by itself.' (Mendikoetxea 1999b:1594)

[25] For example, only a reflexivization analysis can account for the reflexive/anticausative syncretism so commonly found crosslinguistically.

It turns out, however, that this diagnostic does more than distinguish passive from anticausative. As first noted by Chierchia (2004) for Italian, what this diagnostic also does is to distinguish verbs with a CAUSE as part of their denotation from those lacking a CAUSE. In this section, I lay out the facts showing this, drawing first on the Italian facts discussed by Chierchia (2004) and then by showing that things are similar in other languages.

The equivalent of the Spanish *por sí solo* 'by itself' modifier in Italian is *da sé* 'by itself', illustrated by the data in (65).

(65) Gianni mi ha picchiato da sé.
'Gianni hit me by himself.' (Chierchia 2004:42)

The *da sé* 'by itself' modifier is an anaphor that gives rise to the meaning that the NP that antecedes it is the sole agent or cause of the event named by the clause in which it appears (Chierchia 2004:42ff.), so that in (65) the idea is that the sole agent/cause of the hitting event was Gianni. Chierchia shows that *da sé* 'by itself' is acceptable just in case it is locally bound by a subject that can be interpreted as the sole agent/cause of the event, so, for example, the sentence in (66) is judged unacceptable because *da sè* is locally bound by the object, rather than by the subject.

(66) * Io ho picchiato Gianni da sé.
'I hit Gianni by himself.' (Chierchia 2004:42)

Similarly, as already stated above, in order for *da sé* modification to be licit, the subject binding it must be the sole agent or cause of the event named by the clause it is a subject of. Because of this, *da sé* 'by itself' is judged unacceptable in clauses headed by verbs that lack either agentive or causer subjects.[26] As a consequence, stative verbs (67a), which lack both an agentive subject and a CAUSE operator as part of their denotation, and involuntary events such as sweating events (67b), are judged unacceptable with *da*

[26]The data in (67) argue against the claim of Folli (2001:Chapter 2) that *da sé* 'by itself' adds agent/cause entailments, rather than modifying agent/cause entailments lexically specified by the verb. Were Folli's (2001) claim correct, sentences like those in (67) would be expected to be acceptable, since the verbs in these sentences lack both agent and cause entailments.

sé 'by itself'.

(67) a. * Gianni conosce il latino da sé.
'Gianni knows Latin by himself.' (Chierchia 2004:42)
b. * Gianni ha sudato da sé.
Gianni sweat by himself. (Chierchia 2004:42)
c. *è felice da sé
'... is happy by him/her/itself.' (zero Google hits)

Similarly, because the subject of a passive is not the sole causer of the event named by the verb, *da sé* 'by itself' is judged unacceptable with passives, even when the passive verb is indeed causative, as shown by the data in (68).

(68) *La porta è stata aperta da sé.
'The door was opened by itself.'

As already illustrated for the Spanish *por sí solo* 'by itself', the *da sé* 'by itself' phrase is, however, acceptable with anticausatives, as shown by the data in (69).

(69) Anticausatives
a. La porta si è aperta da sé.
'The door opened by itself.' (Chierchia 2004:43)
b. non è stata lei a forzare la serratura, si è aperta da se.
'it wasn't you who found the lock, it opened by itself.' (Google)
c. si è chiusa da se 2 volte nel giro di 10 minuti.
'... it closed by itself two times within ten minutes.' (Google, on a software forum)

The data in (66) and (67) show that *da sé* must be bound by either an agentive or cause subject. The subjects of anticausatives like those in (69) are not agents. Nevertheless, *da sé* is acceptable with anticausatives, leading to the conclusion that the subject must in some sense be the cause of the event named by the verb. The conclusions that are forced on the basis of these data then are (a) that the denotation of anticausatives includes a

CAUSE operator, and (b) that the single argument of the anticausative verb must be, in some sense, the cause of the COS event that it undergoes. On the reflexivization analysis of anticausativization presented above, this is indeed the case—the theme undergoer of the COS event is also the EFFECTOR participant in the eventuality that causes the COS event.

As already discussed in part in §7.2.1, the facts of the Italian *da sé* 'by itself' repeat themselves with the Spanish *por sí solo* 'by itself'. As with *da sé* 'by itself', *por sí solo* 'by itself' must be bound by a causer subject. Because of this, it is not only judged unacceptable with passives as in (70), but also with stative predicates, which lack a CAUSE as part of their lexical semantic representation, as evidenced by the absence of constructions like those in (71) in Google searches.[27]

(70) *El barco fue hundido por sí solo.
the boat was sunk by REFL only
'*The boat was sunk by itself.' (Mendikoetxea 1999b:1594)

(71) a. ?Juan sabe inglés por sí solo.
Juan knows English by REFL self
'*Juan knows English by himself.' (zero Google hits)

b. ?El carro es rojo por sí solo.
the car is red by REFL only
'*The car is red by itself.' (zero Google hits)

Additionally, there are a number of *underived* inchoative verbs in Spanish with which *por sí solo* 'by itself' is reportedly unacceptable, according to Mendikoetxea (1999b:1598). Examples are given in (72).

[27] Consider the following contrasts (where the quotes and the material inside the quotes are the contents of the Google search): while "sabe ingles" 'knows English' gets approximately 74k Google hits, "sabe ingles por si solo" 'knows English by him/herself' gets zero. Similarly for "es rojo" 'is red' which gets approximately 164k versus "es rojo por si solo" 'is red by itself', which gets zero. The same holds for the dialectal variant of *por sí solo* 'by itself' *por sí mismo* 'by itself'—neither "es rojo por si mismo" 'is red by itself' nor "sabe ingles por si mismo" 'knows English by him/herself' get any hits.

(72) a. ??Juan empeoró por sí solo.
Juan worsened by REFL only
'Juan worsened by himself.'
b. ??La leche hirvió por sí sola.
the milk boiled by REFL only
'The milk boiled by itself.'
c. ??El niño creció por sí solo.
the child grew by REFL only
'The child grew up by itself.' (Mendikoetxea 1999b:1598)

The events named by the verbs in (72) correspond to the internally caused COS events argued by Levin and Rappaport Hovav (1995:Chapter 3) and Rappaport Hovav and Levin (1998) to lack a CAUSE operator, which would explain why they are unacceptable with *por sí solo* 'by itself'—these verbs lack a causative LRS. Rather than having the LRS of derived inchoatives like *abrirse* in (41), repeated in (73), they instead have an LRS more like (74), crucially lacking a causing event (Levin and Rappaport Hovav 1995; Rappaport Hovav and Levin 1998).

(73) $\lambda x \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge \theta(v,x) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge open(s)]]$

(74) $\lambda x \lambda s \lambda e[BECOME(e,s) \wedge THEME(s,x) \wedge in\text{–}blossom(s)]$

As shown in (74), the LRS of a verb naming an internally caused event is taken to lack a causing subeventuality. Thus, the single argument of the internally caused verb is not a participant in a causing subevent, and is therefore not a causer in the sense that the single participant of a derived inchoative is. From this, the unacceptability of internally caused verbs with *por sí solo* 'by itself' follows.[28]

[28]It must be stressed at this point that it does not follow, nor does the MH predict it to follow, that all underived inchoative verbs name internally caused COS events. Although this seems to be the claim of Levin and Rappaport Hovav (1995), the theory laid out here has nothing to say about lexicalization—recall that the MH is a claim about word formation operations—and both the LRS in (i) and (ii) as semantic representations for inchoative verbs (where ϕ stands in for a random stative predicate) are consistent with the MH.

(i) $\lambda x \lambda s \lambda e[\exists v[CAUSE(v,e) \wedge \theta(v,x) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge \phi(s)]]$

The *por sí solo* ‘by itself’ modifier, like its Italian counterpart, however, is acceptable with derived inchoatives, as shown by the data in (75), and as has already been discussed for Spanish.[29]

(75) a. El barco se hundió por sí solo.
the boat REFL sank by REFL only
‘ The boat sank by itself.’ (Mendikoetxea 1999b:1594)

b. La puerta se abrió por sí sola.
the door REFL opened by REFL only
‘The door opened by itself.’ (Mendikoetxea 1999b:1593)

c. La ruptura continuó alrededor de esta barrera, pero treinta segundos
the rupture continued aroud of this barrier but thirty seconds
después, cuando había avanzado 200 km, el duro bloque de la barrera
after when had advanced 200 km the tough block of the barrier
se rompió por sí solo.
REFL broke by self only
‘The rupture continued around the barrier, but after thirty seconds, when it (the rupture) had advanced another 200 km, the tough block(?) of the barrier broke by itself.’(Google)

d. No te preocupes, que se murió por sí solo.
no 2SING bother that REFL died by REFL only
‘Don’t worry; it (= a hot topic of discussion on a discussion list) died by itself.’ (Google)

(ii) $\lambda x \lambda s \lambda e[BECOME(e,s) \wedge THEME(s,x) \wedge \phi(s)]$

I.e., the MH does not predict that either (i) or (ii) would be the exclusive kind of representation that a morphologically simple inchoative verb would have. And indeed, as noted by Piñón (2001a), it does seem to be the case that morphologically simple inchoative verbs vary in their behavior, suggesting, I believe, that some may have representations like (i) and others representations like (ii), something certainly not ruled out by the MH. As already noted in §8.3.3, much more research is needed on the semantics and syntax of morphologically simple inchoative verbs.

[29] Indeed, as discussed in §7.2.1, the fact that anticausatives occur with this modifier is one of the few reliable ways in which they can be distinguished from passives.

Again, the conclusion is that derived inchoatives have as part of their denotations a CAUSE operator, contrary to the central claim of the deletion account of anticausativization, the only analysis of anticausativization in the literature that is not consistent with the MH. In addition to the Italian and Spanish data already discussed, similar observations have been made about the equivalent of *da sé* 'by itself' in German (Alexiadou *et al.* 2006), Greek (Alexiadou *et al.* 2006) and Slovenian (Grahek 2002), i.e., that it points to the existence of a CAUSE operator as part of the denotation of derived inchoatives in those languages.[30]

The data discussed in this section, then, lead to the conclusion that derived inchoatives, contrary to the claim of the deletion analysis and consistent with the reflexivization analysis (and many others) of anticausativization discussed above, do indeed have a CAUSE operator as part of their LSR. This is precisely what the MH predicts. Additionally, however, given that *da sé* 'by itself' and its kin otherwise must be bound by a causer subject, the facts also suggest that the subject of a derived inchoative is also viewed as the causer of the event named by the derived inchoative verb. As noted by Chierchia (2004), this is a fact that argues strongly in favor of the reflexivization analysis, the only one on which the single argument of a derived inchoative is a both the causer and undergoer of the COS event named by the derived inchoative.

8.4.2 The "feel like" construction

Another construction showing that derived inchoatives do indeed have a CAUSE operator as part of their lexical semantics is what has been called the "feel like" construction, exemplified by the Albanian data in (76).[31]

(76)	a.	Benit	i	ha-hej	(një mollë).
		Ben	dat.cl.3s	eat-nact.p.imp.3s	(an apple-nom)
		'Ben felt like eating (an apple).'			

[30] Although more work would be needed to thoroughly substantiate the claim, data reported in Fukuda (2006) point to a similar conclusion for Vietnamese.

[31] See Marušič and Žaucer (2005) for detailed discussion of this construction in Slovenian.

b. Benit i ndërto-hej (një shtëpi).
Ben DAT.CL.3S build-NACT.P.IMP.3S (a house-NOM)
'Ben felt like building (a house).' (Kallulli 2006c:273)

The essence of this construction is that the verb appears in the non-active voice rather than in the active voice, and the object of the corresponding transitive/active verb appears as the subject of the "feel like" construction. What corresponds to the subject of the transitive/active verb appears in this construction in the dative case, with the entire construction having the "feel like" meaning exemplified by the glosses in (76).

Independent of the "feel like" construction, non-active morphology serves other functions in Albanian. Of particular interest in the context of this chapter is the fact that the active/non-active distinction serves to mark the causative/inchoative alternation, much in the same way as it does in Greek (Alexiadou and Anagnostopoulou 2004), with the non-active form being the formally derived one, marking the inchoative, as illustrated by the data in (77).[32] In this way, then, for verbs like *break*, the causative/inchoative alternation is accomplished in Albanian by anticausativization, since the inchoative verb (77b) is morphologically marked, while the causative (77a) is not.

(77) a. Beni theu dritaren.
Ben.NOM broke.ACT.AOR.3S window.ACC
'Ben broke the window.' (Kallulli 2006c:275)

b. U thye dritarja.
NACT broke.AOR.3S window.NOM
'The window broke.' (Kallulli 2006a:5)

In addition to a simple inchoative use, a non-active anticausative like (77b) can also be used in the "feel like" construction, as exemplified by the data in (78), which gives an example of the verb marked with the aorist aspect, and (79), an example of the verb

[32]Like most other languages with an anticausative, Albanian also uses the same morphological marking, the non-active voice, to derive reflexive-type meanings (Newmark *et al.* 1982:34), again, an unsurprising fact given the proposed reflexivization analysis of anticausativization.

marked with the imperfective aspect.[33]

(78) Benit i-u thye dritarja.
ben.DAT DAT.CL3S-NACT break.AOR.3S window.NOM
a. 'Ben unintentionally/involuntarily broke the window.'
b. '*Ben felt like breaking the window.' (Kallulli 2006c:276)

(79) Benit i thy-hej dritarja.
Ben.DAT DAT.CL.3S break-NACT.P.IMP.3S window.NOM
a. 'Ben felt like breaking the window.'
b. '*Ben unintentionally/involuntarily broke the window.' (Kallulli 2006c:277)

As shown by the glosses in (78) and (79), a verb like *break* has two possible interpretations in the "feel like" construction—when it appears in the aorist aspect, as in (78), it has what Kallulli (2006c) calls the "unintended cause" interpretation, whereby the dative marked argument is interpreted as the unintended cause of the event named by the anticausative verb. When it appears in the imperfective aspect, however, it has the canonical "feel like" interpretation originally illustrated by the data in (76).

As discussed by Kallulli (2006c), while the "feel like" interpretation seems to be widely available for verbs marked with non-active morphology, the unintended cause interpretation is not so widely available. Namely, while it is available to COS verbs like *break*, it is unavailable to non-causative transitive verbs that have been intransitivized by the non-active morphology. For example, the unintended cause interpretation is unavailable with verbs like *eat*, regardless of aspectual marking. When used with imperfective aspect in the "feel like" construction, such verbs have only the "feel like" interpretation (80a), with the unintended cause interpretation (80b) being unavailable.

(80) Benit i ha-hej (një mollë).
Ben.DAT DAT.CL.3S eat-NACT.P.IMP.3S (an apple).NOM

[33] In the aorist, the non-active is marked by a preverbal clitic, while with the imperfective it is marked inside the verb (Kallulli 2006b:fn. 5). This is irrelevant here, as is why it should be that the unintended cause interpretation arises with the aorist and the "feel like" interpretation arises with the imperfective. What is important for my purposes is simply that in the non-active voice with *break*-type verbs the unintended cause interpretation is possible, while it is not for verbs lacking a CAUSE component.

a. ‘Ben felt like eating (an apple).’
b. ‘*Ben unintentionally ate (an apple).’ (Kallulli 2006c:277)

The same holds when such verbs are used in the “feel like” construction with non-active morphology in the aorist—while the “feel like” interpretation (81a) is available, the unintended cause interpretation (81b) is not.

(81) Benit i-u hëngër (një molleë).
Ben.DAT DAT.CL.3S-NACT eat-AOR.P.3S (an apple).NOM
a. ‘Ben felt like eating (an apple).’
b. ‘*Ben unintentionally ate (an apple).’ (Kallulli 2006c:277)

These facts show that the unintended cause interpretation is available only to verbs that originally have a CAUSE as part of their lexical semantics to begin with, e.g., verbs like transitive/causative *break*. The “feel like” construction cannot add a CAUSE; if it could, then meanings like (80b) and (81b) would be possible interpretations of the “feel like” construction with verbs like *eat*, verbs that are not considered to have a causative lexical semantics. The conclusion, then, is that one possible function of the “feel like” construction for non-active intransitive COS verbs is to specify the nature of the underlying CAUSE already present in the lexical semantics of the anticausative, non-active marked COS verb. This is, in fact, the same kind of conclusion reached by Kallulli (2006a, 2006b, 2006c) on the basis of these facts. This construction, then, provides additional independent empirical support for the claim that there is indeed a CAUSE as part of the denotation of derived inchoatives. Anticausativization does not remove a CAUSE operator and does not, therefore, violate the MH.

8.4.3 Negation

Another argument for a CAUSE in the representation of derived inchoatives, which has not previously appeared in the literature, comes from data already discussed briefly above in §8.3.5.[34] The observation is that negation of sentences with derived inchoatives

[34] I am grateful to Peter Sells and especially to Cleo Condoravdi for much discussion of this section.

is often ambiguous in a way that suggests that they can't name simple BECOME-type events, but must have a more highly-articulated lexical semantic representation, as the arguments elsewhere in this chapter suggest.

The empirical observation is illustrated by the two contexts in (82) and (83), the latter repeated from (49). In the context in (82), in negating the derived inchoative, the son is denying that the glass entered into a state of brokenness.

(82) Father: ¿Se rompió el vaso?
'Did the glass break?'
Son: No, **no se rompió** el vaso.
'No, the glass did not break.'
→ **The glass did not break.**

By contrast, the same phrase in the contrasting context in (83) has a completely different meaning—the father is not denying in (83) that the vase entered into a state of brokenness. Instead, in (83), the father is denying that the vase was the cause of its own entering into a state of brokenness. Indeed, in the context in (83), the vase *does* enter into a state of brokenness, despite the fact that the verb naming the COS event is negated.

(83) Father: ¿Que pasó, hijo?
'What happened, child?'
Son: El vaso se rompió.
'The glass broke.'
Father: **No se rompió** sino que tú lo rompiste!
'The glass didn't *break*—you broke it!'
→ **The glass broke.**

The same state of affairs holds in the naturally occurring example in (84), repeated from (48), where the writer does not deny that the computer was non-functional, but instead denies that the computer was the cause of its entering into a state of non-functionality.

(84) `es.charla.moteros`, Nov. 4, 2003, posted by "Wanchuzri"
> menos mal que la wanchu no puede leer esto . . .
'less bad that Wanchu(zri) can't read this . . . '
> el otro dia se le rompió el ordenador . . . :-/
'the other day her computer broke on her . . . '
Oye, niñato, que ya si te leo y el ordenador **no se rompió** sino que me lo rompiste TU!
'Listen, Niñato, now I do read your message, and the computer didn't *break*, but rather you broke it on me!'
→ **The computer broke.**

What is going on with sentences such as (82), on the one hand, and those in (83) and (84) on the other, is that there are two very different interpretations under negation—one in which it is denied that a COS event was undergone, and another in which something else is denied, namely that the undergoer of the change into the state was also the cause of the COS event.[35] On this second interpretation, crucially, it is not denied that a COS event was undergone; indeed, a COS event *can* have been undergone, as made explicit

[35] In addition to the somewhat marked contexts laid out in (83) and (84), more neutral contexts can also be found in which the same kind of observation can be made, with the same consequences for the nature of the lexical semantic representation of derived inchoatives. This is illustrated by the data in (i) and (ii). In the absence of any intonational marking, the most natural interpretation of (i) out of context is one in which it is denied that the glass underwent a change into a state of brokenness.

(i) **No se rompió** el vaso.
'The glass did not break.'
→**The glass did not break.**

This contrasts with the most natural interpretation for (ii), in which it is not denied that the glass broke—on the contrary, the glass *did* break, but it is denied that the glass was the cause of the change into the state.

(ii) **No se rompió** el vaso por sí solo.
'The glass did not break by itself.'
→**The glass broke.**

Crucially, as argued above, *por sí solo* 'by itself' is not responsible for adding causative semantics to the sentence. Instead, these must come from the meaning of the derived inchoative.

by the data in (83) and (84).[36]

The contrast between the two interpretations can be seen more clearly by considering the formal representation assigned to sentences like (83) and (84), with derived inchoatives, on the reflexivization theory proposed in this chapter. This is laid out in (85).

(85) $\neg\exists v\exists s\exists e[CAUSE(v,e) \wedge EFFECTOR(v,x) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge not\text{-}whole(s)]]$

What (85) says is that there does not exist an eventuality v that caused a change event e into a state s in which x was both the undergoer of the change event and the effector participant in the causing eventuality v. Now, consider the kinds of situations that satisfy this logical representation. First, note that (85) is consistent with a situation in which there exists no COS event e or stative eventuality s, since if these do not exist there can exist no eventuality v that caused the change e into the state s, since these do not exist. Additionally, however, (85) is also consistent with a situation in which there *does* exist a change e into a specified state s. More specifically, (85) would be satisfied by a situation in which the change e into the state s exists, but in which there exists no eventuality v with an EFFECTOR participant x that is also the THEME of the change e. This is precisely what happens with the data in (84).

The important point in the context of the MH is that a theory on which derived inchoatives lack a CAUSE operator cannot capture these facts, since negation of a derived inchoative will always entail the non-existence of the specified COS event. To see this

[36] Precisely the same behavior is observed in Italian, as illustrated by the naturally occurring data (due to Beth Levin) in fn. 18, repeated in (i).

(i) la diatriba l'hai aperta tu, non si e aperta sola, attacando per un tuo infantile capriccio chi non aveva rivolto nemmeno un piccolo accenno alla tua Peloro Truffa
you opened (started) the diatribe; it didn't start by itself ...
`http://www.ngmail.it/forum.nsf/($Messaggi)/F619A60E976C1C8DC125713F003E3BF0?OpenDocument`

Again, the observation is that despite the fact that the derived inchoative *si e aperta* is negated in (i), it is not denied that the diatribe began. What is denied is instead that the diatribe began on its own, the claim being instead, that somebody else started it.

more clearly, consider the representation of the same negated sentences with derived inchoatives on a theory in which the CAUSE is absent from the lexical representation of the derived inchoative. Such a representation is given in (86).

(86) $\neg\exists e\exists s[BECOME(e,s) \wedge THEME(s,x) \wedge not\text{-}whole(s)]]$

The representation in (86) will be satisfied only in a situation in which there does not exist a change event e into a state s. But, as shown by the data in (83) and (84), this is not universally the case for sentences with negated derived inchoatives—in certain environments, sentences with negated derived inchoatives can be used when some entity has indeed undergone a COS event. In this way, then, an any analysis that has it that the representation of derived inchoatives lacks a CAUSE operator cannot capture facts like those in (83) and (84). By contrast, if there is indeed a CAUSE as part of the representation of derived inchoatives, these facts are expected.

8.4.4 Additional arguments

There are various other sets of data from the literature that point to the conclusion that derived inchoatives have a CAUSE operator as part of their denotations. Some of these arguments are less well-developed than the arguments presented in the previous section, but they point to the same conclusion, and so I briefly discuss them here.

The ability to take an adverbial modifier is one of the additional diagnostics that has not uncommonly been used in support of a distinction between inchoatives and passives. For example, Härtl (2003:892) observes the contrast in (87) between passives (87a) and inchoatives (87b) in their ability to take agent-oriented adverbials.

(87) a. Die schüssel wurde absichtlich/leichtsinnigerweise/gerne zerbrochen.
'The bowl was broken on purpose/carelessly/willingly.'
b. *Die schüssel zerbrach absichtlich/leichtsihnnigerweise/gerne.
'The bowl broke on purpose/carelessly/willingly.' (Härtl 2003:892)

The claim is that in (87a), the adverbials say something about the nature of the causing event. Because inchoatives cannot occur with such adverbials (87b), it is argued that they lack a causing event.

It is important to note, however, as Härtl (2003:892) himself does, that the adverbials in (87) are *agent* oriented. Because agentivity and causation are separate notions (DeLancey 1984), it is possible to have causation, without agentivity, as shown, e.g., by the fact already discussed above that verbs that participate in the causative alternation can take non-agentive causers, as shown by the data in (88).

(88) The hammer/the explosion/the wind/Kim broke the vase.

Given this observation, it might be expected that if non-agentive adverbial modifiers could be found, they might be acceptable with derived inchoative verbs, to the extent that they have a CAUSE operator as part of their denotation. In fact, such behavior has indeed been observed by Centineo (1995) for the Italian adverb *violentemente* 'violently'. She observes that for derived inchoatives, which she argues have a CAUSE operator as part of their denotation, *violentemente* 'violently' is an acceptable modifier, as shown by the data in (89a). In contrast, for the inchoative verb *affondare* 'sink', which is morphologically simple, i.e., not derived via anticausativization, she argues that it lacks a CAUSE operator as part of its denotation, and as a consequence cannot be modified by *violentemente* 'violently', as shown in (89b).

(89) a. La porta si è chiusa violentemente.
the door REFL is closed violently
'The door closed violently.'
b. *La nave è affondata violentemente.
the boat is sunk violently
'The boat sunk violently.' (Centineo 1995:63)

Naturally occurring examples collected with Google seem to confirm Centineo's (1995) intuitions—while I have been able to find no examples of *è affondata violentemente* 'sank (fem) violently' or *è affondato violentemente* 'sank (masc) violently', examples of *violentemente* 'violently' with derived inchoatives as in (89a) can be found, as shown in (90).

(90) a. La nostra parentesi si è chiusa violentemente ...
'Our parenthesis closed violently ...'
`http://www.raccontinellarete.it/wordpress/?p=646`

b. ... il gran muro si ruppe violentemente ...
'... the big wall broke violently ...
`http://www.ribollastory.net/grottanelli.html`

c. ... là dove si è rotta violentemente ...
'... over there, where it broke violently ...'
`http://www.macro.roma.museum/italiano/press/tesi/eccher_tesi.pdf`

d. La macchina è andata in testa coda e si è fermata violentemente contro il guard rail.
'The car went into a tailspin and it stopped violently against the guard rail.'
`http://www.repubblica.it/2006/07/sezioni/cronaca/moglie-mastella/moglie-mastella/moglie-mastella.html?ref=hpsez`

Additionally, it is worth noting, that naturally occurring examples cannot be found with Google for stative predicates like **conosce violentemente* 'know violently' and *è felice violentemente* 'is happy violently.' This is noteworthy, since stative predicates, in most cases, lack a CAUSE operator (though see Pylkkänen 2000 for some notable exceptions). Similar data has been observed for Greek by Alexiadou and Anagnostopoulou (2004:131ff.). These facts tentatively offer, then, an additional argument in favor of derived inchoatives having a CAUSE operator as part of their denotation, as is independently predicted both by the proposed reflexivization analysis laid out above and by the MH.

Another argument for a CAUSE in the denotation of derived inchoatives comes from oblique arguments. One of the more central arguments in favor of the position that the denotations of inchoatives of all kinds lack a CAUSE operator has been Roeper's (1987) observation that inchoatives contrast with passives in ability to take an agentive *by* phrase, as illustrated for English by the data in (91).

(91) a. *The ship sank by Bill.

b. The ship was sunk by Bill. (Roeper 1987:268)

The situation is similar in a language with anticausativization, like Spanish, as shown by the data in (92) from Mendikoetxea (1999b).[37]

(92) a. El barco fue hundido por los enemigos / por los misiles.
the ship was sunk by the enemies / by the missiles
'The ship was sunk by the enemies / by the missiles.'

b. ?El barco se hundió por los enemigos / por los misiles.
the ship REFL sank by the enemies / by the missiles
'*The ship sank by the enemies / by the missiles.' (Mendikoetxea 1999b: 1593)

The conclusion generally reached on the basis of data like these is that while the passive has an implicit agent argument, the inchoative does not. Recent work by Alexiadou *et al.* (2006) and Kallulli (2006a, 2006b, 2006c), however, challenges this conclusion. First, drawing on previous work like that of DeLancey (1984), they observe that agentivity and cause are separate notions, and that just because inchoatives cannot take agentive *by* phrases, it does not follow that they lack a causer. Further, they show that it is indeed the case that inchoatives, in particular derived inchoatives, can take causer oblique phrases, as illustrated by the Greek data in (93), where *apo* 'by/from' specifies the cause of the COS event named by the derived inchoative.

(93) a. O sismos skotose ti Maria.
the earthquake killed the Mary
'The earthquake killed Mary.'

b. I Maria skotothike apo ton sismo.
the Mary killed.NACT by/from the earthquake

[37]The situation with this contrast is more complicated in Spanish than it is in English. Although not widely used, it is the case that naturally occurring examples are found of *se* marked verbs with *por* 'by' phrases (Mendikoetxea 1999a:1683). The claim is that when this happens, such uses are passive uses of the *se* marked verb, rather than anticausative uses (Mendikoetxea 1999a:1683). Because of this, I have given (92b) a question mark, whereas Mendikoetxea (1999b) gives it a star.

'Mary died from the earthquake.' (Alexiadou *et al.* 2006:15)

Interestingly, according to Alexiadou (p.c.), it is also not the case that *apo* 'by/from' phrases are acceptable with stative verbs, suggesting that they do indeed modify a CAUSE in the denotation of the derived inchoative, rather than adding a CAUSE—if they could simply add a CAUSE, then it would be expected that they would be acceptable with stative predicates, contrary to fact, as shown by the data in (94).[38]

(94) a. *To edafos itan kokino apo tis diarkus drastiriotitas tu ifestiu.
the ground was red because the constant volcanic the activity
'The ground was red from the constant volcanic activity.'

b. *I iholipsia itan kaki apo tin hamili piotita ton dedomenon
The recording was bad from the low quality the data.GEN
'The recording was bad from the low quality of the data.' (Artemis Alexiadou, p.c., 8/30/2006)

Internally caused COS verbs, often believed to lack a CAUSE component as part of their denotation (Centineo 1995; Levin and Rappaport Hovav 1995), are also judged unacceptable with *apo* 'by/from' phrases specifying the cause of the COS event.[39]

(95) *Ta luludia anthisan apo ti kalokeria
The flowers blossomed from the weather
'The flowers blossomed from the good weather.' (Alexiadou, p.c., 8/30/2006)

The conclusion is that *apo* 'by/from', and adpositions like it, seems to be sensitive to the presence/absence of a CAUSE in the lexical semantic representation of the verbs in the clauses it appears with. The fact that it can appear with derived inchoatives, then, has been taken as an argument in favor of inchoatives derived by anticausativization having a CAUSE as part of their lexical semantic representation (Alexiadou *et al.* 2006; Kallulli

[38]The sentences in (94) are judged acceptable by Alexiadou and the other speakers she consulted with *eksetias* 'because' in place of *apo* 'by/from'.

[39]Alexiadou (p.c.) reports that in contrast to *apo* 'by/from', which is unacceptable in a sentence like (95), *me* 'by/from', is acceptable. She conjectures that the difference between *me* and *apo* may have to do with specification of a direct (*apo*) versus an indirect (*me*) cause.

2006a, 2006b, 2006c), consistent with the MH.

8.5 Discussion and concluding remarks

In Chapter 7, I embarked upon evaluation of the second strong prediction of the MH, repeated in (96).

(96) Words naming non-causative COS events are never derived from words naming causative COS events.

I then went on to show that while it is indeed the case that, consistent with the prediction of the MH in (96), words naming causative changes of state are often derived from words naming non-causative changes of state, this is not universally the case. Indeed, in a wide variety of languages, an anticausativization operation is found that does exactly the reverse, deriving words naming non-causative COS events from words naming causative COS events. I went on to examine the phenomenon in more detail, first laying out the facts of the phenomenon and previous analyses in Chapter 7. Among the previous analyses of the phenomenon, perhaps the most widely accepted is one which treats it as an operation that removes a CAUSE operator from the lexical semantic representation of lexemes to which it applies. If this indeed were the lexical semantic nature of anticausativization, the process would offer direct counterevidence to the MH.

In light of this, I undertook a detailed investigation of the process, beginning by laying out a number of empirical benchmarks that I believe any comprehensive analysis of anticausativization must account for, completely independent of considerations surrounding the MH. Focusing on these empirical facts, I laid out a typology of analyses of anticausativization that have appeared in the literature, showing that no current analysis comes close to accounting for the empirical benchmarks.

This led to the development of my own analysis of anticausativization in the current chapter, treating anticausativization as a reflexivization operation. I follow Chierchia's (2004) original formulation of anticausativization as reflexivization, in its Montagovian guise. My analysis, however, differs from Chierchia's in that I develop the analysis in the context of a decompositional Davidsonian approach to lexical semantics, taking a particularly detailed look at verb semantics.[40] Chierchia, by contrast, develops his analysis in the context of property theory (Chierchia 1984), and is much more concerned with sentential compositional semantics and the morphosyntax of unaccusativity than he is with the kinds of lexical semantic questions that I have been concerned with in this chapter, for example the underspecified nature of the subjects of alternating verbs and how the reflexivization analysis, when viewed in the context of this fact, accounts for alternation and non-alternation. My focus on verb semantics has also led me to a different treatment of particular classes of non-alternating verbs, such as internally caused COS verbs. While Chierchia treats these as derived covertly from causatives in order to give a unified analysis to unaccusative verbs, I instead follow Levin and Rappaport Hovav (1995) in treating them as lexically basic as intransitives. Given their morphological unmarkedness, this move is motivated by the methodological stance laid out in Chapter 2 of Taking Morphology Seriously.

Additionally, I have also taken some care to point out the frequency with which markers of anticausativization show syncretisms not only with reflexive markers, but also with passives. I then discussed diagnostics that distinguish the two, and took this fact into account in developing the analysis, pointing out its consequences, for example in a number of areas where it has been previously unappreciated (e.g., the putative entailment relationship between causative and inchoative). Also, I have tried to show how it is that what is generally known as the agentive "reflexive" interpretation of reflexives differs from the non-agentive "anticausative" interpretation, how these interact with verb semantics, and how morphological markers of reflexivity could undergo bleaching

[40]In this respect, the analysis moves somewhat in the direction suggested by Chierchia (2004) in the postscript to his paper. In a crucial sense, it does not, however, in that I do not alter the formalization of reflexivization, as Chierchia does in the postscript—instead, I maintain that the anticausativization and the reflexivization operations are indeed one and the same, as does Chierchia in the first part of his paper. Chierchia's (2004:54) reasons for backing off this strong position had to do with entailment relationships between sentences headed by causatives and sentences headed by inchoatives. As I showed in this chapter, however, the relevant facts, particularly in languages with anticausativization (cf. the English facts Chierchia analyzes), seem to be more complicated than has been previously appreciated, and it is not at all clear that the entailment relationship that Chierchia is concerned to capture in the postscript does indeed hold.

in order to become markers of anticausativization. Although this kind of diachronic relationship between anticausative and reflexive has been observed at least since Lakoff (1971), the analysis in this chapter, so far as I know, is the first to capture it formally.

Other questions, to be sure, are broached by Chierchia (2004), though not in the level of detail that I have examined them here. Chierchia's point of departure for his analysis, for example, is the observation that in many languages anticausativization is accomplished with reflexive morphology. I have shown, drawing on Haspelmath's (1987,1990) typological work, that this generalization is even stronger than Chierchia may have appreciated. Similarly, I have built on Chierchia's argument for a CAUSE in derived inchoatives, by adding a number of additional arguments that have appeared in the literature subsequent to his work, thereby bolstering the case for this kind of reflexivization analysis.

Ultimately, I showed that the reflexivization analysis accounts for a wide array of facts, both synchronic and diachronic, in a way that no other analysis in the literature has. On empirical grounds, then, it is, I believe, the best analysis of anticausativization. More importantly, perhaps, from the perspective of this dissertation is the fact that it also happens to be consistent with the MH. On the reflexivization analysis, anticausativization is semantically a reflexivization operation on which there is no deletion of a CAUSE operator in the lexical semantic representation. More importantly, consistent with this core claim of the analysis that derived inchoatives have a CAUSE operator as part of their lexical semantic representation, I showed on the basis of a number of empirical tests, independent of the analysis, that this operator is indeed present—derived inchoatives have causative lexical semantics. Contrary to initial appearances, then, anticausativization, rather than providing evidence against the MH, turns out to be the exception that proves the rule—even in a case where it appears perfectly clear that decompositional operators are being deleted, they are, in fact, not. As I have argued at length in this dissertation, word formation operations simply do not do that, so it is not surprising to find that anticausativization does not do this either.

Part IV

Beyond states and changes of state

Chapter 9

The MH in other empirical domains

In the preceding chapters I have examined in some detail the predictions of the Monotonicity Hypothesis in the context of the derivational relationship between words naming states and words naming changes of state. Given the relatively uncontroversial decompositional representations of states and changes of state laid out in Chapter 2 the MH was shown to make a number of straightforward predictions about possible and impossible derivational relationships between words with these meanings. Throughout the discussion, I have examined and refined these predictions on the basis of additional knowledge about the semantics of words with state and COS meaning, confronting two challenges in particular: apparently derived words naming states and anticausativization. Ultimately, I have shown that given a solid understanding of the semantics of words with these meanings, the predictions of the MH can be seen to be borne out.

As was first suggested in Chapter 1, the predictions of the MH are not, however, confined to this limited empirical domain. Indeed, in Chapter 1 I introduced the MH in the context of larger questions about the semantics of word formation operations, these questions being, first, what is it that word formation operations do and do not do from a semantic perspective, and, second, why. I suggested the MH as one constraint (of most likely many) on the semantics of word formation, not restricted simply to the domain of states and changes of state, but to word formation operations more generally. The claim of the MH quite simply is that while word formation operations add decompositional operators, they do not remove them. If this is correct, as suggested throughout this dissertation, there should be implications extending far beyond the domain of states and changes of state. In fact, for any pair of derivationally related words, given a reasonably good understanding of the lexical semantics of the two words, it should be possible to evaluate the claims of the MH and undertake typological investigation. As discussed in Chapter 2, words with state and COS meaning are exceptionally well-understood semantically when compared to words with other kinds of meanings, a fact which led me to propose that empirical domain as an ideal one for empirical examination of the MH. Nevertheless, I believe that there are many other empirical domains that once their lexical semantics are a bit better fleshed-out, would also present themselves as good testing grounds for the MH. Although detailed examination of the lexical semantics of these areas goes far beyond the scope of this dissertation, in this chapter I simply lay out some of the empirical domains that I believe suggest themselves as areas for promising future research on the MH, with the hope that this will motivate both more lexical semantic research into these areas as well as typological research of a kind that would shed light on the MH. The areas that I briefly touch on in this chapter are: manner and manner/path verbs; contrasts in manner and result verb behavior; result nouns; denominal verbs; augmentative and diminutive derivations; and applicatives.

9.1 Manner and manner/path verbs

Levin and Rappaport Hovav (1998), drawing on Talmy (1985), discuss the morphological relationship between verbs naming manner of motion events and verbs naming manner of motion events including a path component. The distinction is illustrated by the English data in (1).

(1) a. Kim ran.
    b. Kim ran to the store.

While (1a) can be used to name a directionless motion event, e.g., running in place, (1b) necessarily has a direction component, i.e., Kim is running in a direction toward the store. As Talmy (1985) and Levin and Rappaport Hovav (1998) discuss, although it is not the case that all languages can use manner verbs with direction components, as in (1b), some, like English, can. Further, although in English there is no overt derivational relationship between the verbs naming the manner and manner/path events in (1), in some languages, like Russian, there is. As illustrated by the data in (2) and (3), in Russian the verb naming the manner/path variant is morphologically derived from the verb naming the manner variant.

(2) Russian

a. On begal po komnate.
he-NOM ran over room-DAT
'He ran around the room.'

b. On v-bežal v komnatu.
he-NOM in-ran in room-ACC
'He ran into the room.' (Levin and Rappaport Hovav 1998:257)

(3) Russian

a. On plaval v ozere.
he-NOM swam in lake-PREP
'He swam in the lake.'

b. On pere-plyl čerez reku.
he-NOM across-swam across river-ACC
'He swam across the river.' (Levin and Rappaport Hovav 1998:257)

According to analyses of the lexical semantics of structures like these due to Van Valin (1990:224) and Pustejovsky (1992:58,63), the lexical semantics of manner/path variants are an augmentation on the lexical semantics of the manner variant, something like (4) and (5).[1]

[1] It is worth noting here that it is not, in fact, clear that the particular representations assigned by Van Valin (1990) and Pustejovsky (1992) to manner and manner/path verbs is indeed correct. According to them, the manner/path variant has a CAUSE component. Van Valin and LaPolla (1997:101), Levin and Rappaport Hovav (1998,1999) and Rappaport Hovav and Levin (2001) present a number of arguments against the claim that the manner/path variants are causative. What is important for the MH is not that

(4) Mary ran.
$[run(m)]$

(5) Mary ran to the store.
$[[run(m)] \ \wedge \ [BECOME \ [AT(m, the - store)]]]$

To the extent that representations like the ones in (4) and (5) approximate the right ones for manner and manner/path verbs, the meaning of the manner/path verb has decompositional operators that the corresponding manner verb does not have. Assuming that something like this is correct, then the MH makes a clear prediction about possible relationships between derivationally related verbs with these meanings: while manner/path verbs can be derived from manner verbs, manner verbs are predicted not to be derived from manner/path verbs because such a derivation would involve the deletion of decompositional operators like BECOME and AT in going from e.g., (5b) to (5a). Such a derivation would represent a violation of the MH.

Further research is required to determine the extent to which this prediction is borne out; based on the data in Levin and Rappaport Hovav (1998), it certainly appears to be the case that the prediction is correct for Russian. Whether the MH stands up to further scrutiny in this domain from a wider selection of languages seems an area for interesting future research on the MH.

9.2 Manner versus result verbs

Rappaport Hovav and Levin (1998) examine a number of contrasts between verbs with a manner component, like *sweep*, and verbs with a COS component like *break*, attributing certain aspects of their behavior to an interaction between monotonicity and Grimshaw's (2005) structure/content argument distinction. I begin by outlining their empirical observations, following this by their explanation, which draws in part on something like

they are causative, but simply that the manner/path variants have a lexical semantic representation built on the lexical semantics of the manner counterpart. As such, I have slightly altered the representation in (5), making the manner/path lexical semantics a coordination of two events, rather than assuming a CAUSE relation between them. This is, however, basically irrelevant—even if the right representation were a causative one, this would be fine for the MH.

the MH.

The first observation is that two argument manner verbs more readily allow omission of their internal argument than do COS verbs (Rappaport Hovav and Levin 1998:102). So, while both the manner verb *sweep* and the COS verb *break* can appear in constructions with two arguments, as shown in (6), only manner verbs like *sweep* (7a), but not COS verbs like *break* (7b) can drop their internal argument.

(6) a. Kelly swept the floor.
    b. Kelly broke the vase.

(7) a. Kelly swept.
    b. * Kelly broke.

Additionally, as illustrated by the data in (8), verbs with a manner component like *scrub* and *rub* can appear with non-subcategorized objects as shown in (8a) and (9a), while this is not the case for COS verbs like *break* as illustrated by the facts in (8b) and (9b) (Rappaport Hovav and Levin 1998:103).

(8) a. Cinderella scrubbed her fingers to the bone.
    b. *The clumsy child broke his knuckles to the bone.

(9) a. The child rubbed the tiredness out of his eyes.
    b. *The clumsy child broke the beauty out of the vase.

Rappaport Hovav and Levin go on to note additional contrasts in the constructions that such verbs can enter into, among them the fact that while manner verbs can be used in change of location constructions, COS verbs cannot, a fact illustrated by the data in (10)–(12) (Rappaport Hovav and Levin 1998:103).

(10) a. *Kelly broke the dishes off the table.
     (intended meaning: Kelly removed the dishes from the table by breaking the table)
     b. Kelly swept the leaves off the sidewalk.

(11) a. *Kelly broke the dishes off the table.

(intended meaning: Kelly broke the dishes and as a change of state they went off the table.)

b. Kelly shoved the dishes off the table.

(12) a. *Kelly broke the dishes into a pile.
(intended meaning: Kelly broke the dishes and made a pile out of them)

b. Kelly swept the leaves into a pile.

The broad generalization that Rappaport Hovav and Levin reach on the basis of data like these is that while manner verbs are very flexible with respect to the kinds of constructions in which they can be used, COS verbs are much less flexible. They argue that this generalization, and these facts, follow from their assumptions about the lexical semantic representations of such verbs, combined with a monotonicity assumption (our MH), and Grimshaw's (2005) contrast between structure and content arguments (Rappaport Hovav and Levin 1998:104). The point of departure for this explanation is their lexical semantic representations in (13), for manner verbs, and (14) for COS verbs.

(13) Manner verb
$[X\ ACT_{<MANNER>}\ \underline{Y}]$

(14) COS verb
$[[X\ ACT]\ CAUSE\ [BECOME\ [Y < STATE >]]]$

For Rappaport Hovav and Levin, while the lexical semantic representation of manner verbs has only an activity component specifying some manner, COS verbs have the activity, in addition to a CAUSE and a COS component. Further, some manner verbs, like *sweep*, *rub*, etc. are such that they can take an internal argument. Rappaport Hovav and Levin argue that with manner verbs, the ability to take an internal argument is a property of the idiosyncratic root component of the lexical semantic representation. In this way, the internal argument of a manner verb contrasts with the internal argument of a COS verb, which is subcategorized for simply by virtue of what it means to change into a state—any change into a state has to be undergone by some undergoer. This is not necessarily the case, on Rappaport Hovav and Levin's view, for verbs with only a manner component. The difference in the nature of the two kinds of argument—the former dubbed "content" the latter dubbed "structure"—is represented graphically in (13) and (14) by underlining for content arguments. Structure arguments, by contrast, are not underlined, and must be present by virtue of well-formedness conditions for the decompositional operators (e.g., ACT must take an external argument, etc.).

The appeal to the MH, for Rappaport Hovav and Levin, then, is in explaining why it is that manner verbs can appear in so many constructions, while COS verbs cannot. The claim is that while lexical semantic operators (and their associated structure arguments) may always be added, they cannot be removed (Rappaport Hovav and Levin 1998:103). Because operators can be added, it then becomes unsurprising that manner verbs can appear with a change of location component, as shown in (10b), (11b), and (12b). Additionally, because operators cannot be removed, it is expected, they argue, that COS verbs cannot undergo object drop, as shown in (7b).[2]

The empirical contrasts between manner verbs and COS verbs observed by Rappaport Hovav and Levin (1998) seem real, and I believe there is something to their invocation of the MH in this context. Still, I believe that there is much that remains to be done in this area to clarify the analysis, as the formal status of the structure/content distinction, upon which much of the argumentation depends, is not made entirely clear. Future work on the MH should seek not only to flesh out this idea, but also should examine crosslinguistic data to determine if the empirical contrast discovered by Rappaport Hovav and Levin (1998) is found elsewhere, and whether there might be contrasts in

[2]In Dowty (1979:308) object drop is formalized simply as existential binding of the internal argument. This makes sense, given the observation that even when the object of manner verbs like *sweep* is dropped, speakers still have the intuition that *something* is being swept (Levin 1993:33 and references there), so it is not the case that the argument is completely removed from the lexical semantic representation. Dowty's rule, however, is not sensitive to the difference between manner verbs and COS verbs observed by Rappaport Hovav and Levin and clearly overgenerates, predicting object drop with COS verbs like *break*. If some way, then, can be found of better fleshing out what it means to be a structure argument, then a way of formalizing the object drop rule would be to existentially bind an internal argument, as suggested by Dowty, but defining the existential binding operation only for content arguments, and not for structure arguments. In this way, the rule would be well-defined for transitive verbs like *sweep*, but not for transitive verbs like *break*. Finding a way of formally distinguishing between structure and content arguments, then, seems like an important area for future research on the formal nature of lexical semantic representations that has clear empirical consequences.

derivational morphology that line up with the claimed contrasts in derivational behavior.

9.3 Result nouns

Another area where the MH most likely makes some clear predictions that could be subjected to typological investigation is in the area of result nouns, i.e., nouns naming an entity that is the result of some prior event. This is illustrated by the English data in (15).

(15) a. Kim laughed **a laugh**.
  b. Kim saw **a crack** in the vase.
  c. Kim smelled Kelly's **fart**.
  d. Kim enjoyed **the walk**.

What the bolded nouns have in common is that, at least in English, they are zero-related to verbs naming an event that gives rise to them. More specifically, *a laugh*, for example, does not exist without some prior instantiation of the event named by the zero-related verb *laugh*. The situation is similar for *a crack, a fart, a walk*, etc. It seems, then, that a decompositional approach to the meanings of result nouns like the ones in (15) should include in the meaning of result nouns the event named by the zero-related verb. Assuming this move is justified (which remains to be seen on the basis of thorough lexical semantic research), then the MH makes a prediction about the derivational relationship between verbs and result nouns that presuppose an event named by a derivationally related verb: the noun should be derived from the verb, and never vice versa. At present, I know of no crosslinguistic study of result nouns with data bearing on this prediction. Future work on the MH should investigate this phenomenon from both a broad typological perspective and from a detailed lexical semantic perspective on individual languages, particularly if there are any that appear to counterexemplify the prediction.

9.4 Denominal verbs

As discussed in the initial chapters of this dissertation, precursors to the Monotonicity Hypothesis come out of early work trying to understand the derivational relationship between nouns like *box* and *saddle* in (16a) and (17a) and their zero-related verbal counterparts as in (16b) and (17b) (Marchand 1964; Ljung 1977; Clark and Clark 1979; Kiparsky 1982, 1997; Hale and Keyser 2002).

(16) a. Kim put the books in a box.
b. Kim boxed the books.

(17) a. Kim put a saddle on the horse.
b. Kim saddled the horse.

Although the kind of lexical semantic relationship between the noun and the verb is different for different kinds of noun/verb pairs (location, locatum, instrument), the general observation that has been consistently made in decompositional work on the topic and its precursors is that the meaning of the noun is embedded in the meaning of the verb, whether "meanings" are treated as semantic (Kiparsky 1997) or syntactic (Hale and Keyser 2002) objects. This is exemplified for the verb *saddle* in (18), which gives Kiparsky's (1997) representation of it.

(18) $\lambda z \lambda y \lambda x[CAUSE(x, (HAVE-ON(y, z))) \wedge SADDLE(z)]$

The observation, schematized by representations like the one in (18), is that the meaning of verbs like *saddle* and *box* properly include the meanings of the corresponding nouns. Decompositionally, this is represented by embedding the meanings of the nouns in the meanings of the verbs, building up the meaning of the latter with decompositional operators, like CAUSE and others.

Given these observations about the meanings of noun/verb pairs like *box*/*box* and the like, which seem to be rather uncontroversial in the literature, the MH makes clear falsifiable predictions about possible derivational relationships between words with these meanings. Specifically, while the verb could be derived from the noun via the addition of operators, consistent with the MH, the reverse is predicted not to happen—if the noun were derived from the verb, an operator deleting derivation would necessarily be involved, in violation of the MH. Given what seems to be a general consensus about the representational meaning of the noun when compared to the meaning of the verb, this seems like a very promising area for future crosslinguistic research on the MH.

9.5 Augmentative and diminutive derivation

Another area for investigation of the MH, already touched on in Chapter 1 is the relationship between nouns and augmentatives and diminutives of nouns. As already noted, Kiparsky (1982:8) makes the following observation:

> ... although languages commonly have augmentative or diminutive affixes (e.g., *pig+let*), they do not have affixes which neutralize inherent augmentative or diminutive meanings in lexical items (e.g., a hypothetical suffix **–bung* such that **calf+bung* means 'bovine animal'). (Kiparsky 1982:8)

This claim merits further investigation. As a preliminary to study in the context of the MH, a better understanding would first have to be reached of the decompositional meaning of augmentatives and diminutives in relation to the meanings of their associated nouns, with particular focus to factor out the lexical semantic from the pragmatic, an intricate matter (Dressler and Barbaresi 1994). Kiparsky's discussion, at least when placed in the context of the MH as elaborated in this dissertation, presumes that there can be identified decompositional operators that are responsible for augmentative and diminutive meaning. So far as I know, this has never been done before, and would certainly require detailed study of augmentatives and diminutives, I believe, in the context not only of a decompositional theory of word meaning, but also in the context of a truth-conditional theory of semantics, on a par with the work done by Dowty (1979) for states and changes of state. Once such work has been carried out and the predictions of the MH are clear, typological investigation could be carried out. I believe that this would be an area where quick progress could then be made on the MH, since information about augmentatives and diminutives can most likely be gleaned from good reference grammars and dictionaries, making typological investigation feasible.

9.6 Applicatives

Pending further semantic analysis, another relatively transparent prediction of the MH is that while there might be derivational operations like those typically labeled *applicatives* crosslinguistically (see e.g., Peterson 1999), there should not exist derivational operations that do exactly the opposite of applicatives; that is, there should be no anti-applicativization. In this section I explain this prediction in a bit more detail.

Applicatives are derivational operations that affect the lexical semantics of a verb in that they are responsible for adding an argument along with thematic information for that argument. The example in (19) from Ulwa is illustrative of the phenomenon.

(19) Ulwa

a. Muih balna Karawala asang-ka kau pan isau pal-ka **dak-dida**.
person PL Karawala town-3SING in tree many very-ADJ cut-3PL.PAST
'People cut many trees in the village of Karawala.' (notes, 460)

b. Una balna bai kaupak w-î Karawala pan-ka **kang** dak-dida.
mestizo PL far from come-SS Karawala tree-3SING APPL cut-3PL.PAST
'The Mestizos came from far away and cut down Karawala's trees (on them).' (notes, 460)

While the verb *daknaka* 'cut' in (19a) is transitive, the verb *kang daknaka* 'cut on' in (19b) is ditransitive, taking an additional (applied) argument with malefactive thematic properties. While it is not entirely clear to me without further research how best to represent the derived verb *kang daknaka* 'cut on' in decompositional terms, it is clear that the representation will entail an augmentation of the decompositional representation of the verb *daknaka* 'cut' in order to properly capture the facts that there is an additional argument and that it has the thematic properties that it does. This kind of derivational operation, again pending further analysis of the decompositional representation, seems almost certain to be found consistent with the MH.[3]

What would seemingly be inconsistent with the MH, or at least would definitely merit further examination in the context of the MH, would be an operation that did precisely the opposite of the derivational operation marked by *kang* in Ulwa in (19). Such a derivational operation is illustrated for the hypothetical "anti-Ulwa" in (20).

(20) Anti-applicativization in anti-Ulwa

a. Andrew Karawala panka **usdai**.
'Andrew cut the trees of Karawala on the Karawalans.'

b. Andrew panka **zang usdai**.
'Andrew cut the tree.'

What the anti-applicativizing derivational operation marked by the hypothetical *zang* in (20b) does is to remove the malefactive argument and associated semantics from the lexical semantic representation of the hypothetical verb *usdai* 'x cut y on (malefactive) z' in (20a). It is unclear to me if such derivational operations exist or not. Without knowing first if they exist and second what their semantics is like in more detail, it cannot be said with certainty that they would violate the MH. Nevertheless, it seems quite likely that

[3]The kind of applicativization seen in Ulwa as in (19) must be distinguished, for the purposes of evaluation of the MH, from another perhaps better known kind, in which an oblique is simply promoted to a core argument. This is illustrated by the data from Ainu in (i).

(i) a. poro cise ta horari.
big house in live
'He lives in a big house.'

b. poro cise e-horari.
big house APPL-live
'He lives in a big house.' (Shibatani 1996: 159 in Peterson 1999: 1)

In the example in (i), it is not immediately apparent if there is anything going on at the level of lexical semantic representation; it could simply be that all the applicative does is to promote a non-core argument to core argument status. Such an operation may have some kinds of consequences for the meaning of the sentence, but these are not necessarily the result of the word-formation operation, but could have instead to do with differences in meaning associated with arguments and obliques (Beavers 2006). Further investigation of this kind of applicativization would also need to be pursued if Ulwa-type applicativization were further investigated. Nevertheless, the relevance of this perhaps more common kind in the context of the MH is less apparent.

they would. It seems promising, then, that at least in Ulwa, the operation is as in (19), and not as in (20), an asymmetry that seems likely to fall out of the MH. This is an area, then, for further typological and formal work in the context of the MH.

9.7 Concluding remarks

In this chapter I have surveyed several empirical domains that suggest themselves as fruitful areas for further examination of the MH. This discussion is merely suggestive and not meant to be exhaustive; there are many other areas which also look potentially interesting, among them the relationship between directional, locative, and source prepositions (Jackendoff 1983; Svenonius 2006), the conative alternation (Guerssel *et al.* 1985; Levin 1993; Beavers 2006), adjectival diathesis alternations (Landau 2006), and others. It is my hope that future work will investigate these areas in more detail, from both a detailed semantic perspective and from broad typological perspective in order to further examine the extent to which the MH is empirically justified. Independent of the MH, such work is certain to broaden the database of semantic operations that word formation operations perform, thereby shedding more light on the semantic nature of word formation, whether it does not or does turn out to be in compliance with the MH, as I have argued in this dissertation.

Chapter 10

Conclusion

In this final chapter, I first summarize the contents of the dissertation. I then discuss its major results, particularly in the context of areas for future research.

10.1 Summary

I took as my point of departure in Chapter 1 the observation, which has been made by others as well, that there is an asymmetry in the amount of attention devoted in the literature to the structural side of word formation operations when compared to their semantic side. In light of the progress made in lexical semantics over the past decades, I made the case for investigation of questions like those in (1) in the domain of word formation operations.

(1) a. From a semantic perspective, what do word formation operations do and what don't they do?
 b. Why don't word formation operations do the things they don't do?

The question in (1a) is simply a question about what the data are; to a large degree, we still don't know what kinds of semantic operations word formation operations perform on word meanings and what kinds of operations they don't perform. This kind of typological question, with few exceptions noted in Chapter 1, is not one that is generally posed in the literature. Moving beyond the question about what the empirical space of word formation operations is, the obvious question to ask is why it should be that way. In this dissertation, I have sought to address a small corner of these two problems by examining a particular hypothesis about one kind of operation on word meanings that word formation operations could conceivably effect. The kernel of this idea, which I call the *Monotonicity Hypothesis*, goes back at least to Kiparsky (1982), and is the idea that word formation operations can add, but not remove elements of meaning.

The MH, to the extent that it has been formulated at all in previous work, I argued in Chapter 2, is vague and difficult to test. In that chapter, as a consequence, I consider the nature of word meaning, and how the MH might be coherently formulated in the context of such a theory. Ultimately, I argued that the MH makes most sense in the context of a decompositional theory of word meaning, where the decompositional operators are themselves situated in a theory of reference, like that of Montague (1970, 1973). Such an approach is precisely the one taken by Dowty (1979) in his pioneering work on word meaning, and his general approach was largely adopted. This discussion led to the conceptual recasting of the MH in decompositional terms, allowing derivational operations that add decompositional operators but precluding derivational operations that remove decompositional operators. In light of this discussion, I offered some preliminary thoughts about how the MH, in its decompositional guise, might follow from broader principles of grammar, such as the Principle of Compositionality. I offered no formal proof of this conjecture, but noted directions for future research.

With this much as background, I then discussed my criteria for the evaluation of the MH in the context of derivational morphology. As a methodological operating principle, I adopted a stance due to Paul Kiparsky called “Taking Morphology Seriously”. By this criterion, I consider that given a morphologically marked/unmarked pair related by a productive word formation operation, in the absence of evidence to the contrary, lexical semantic direction of derivation matches morphological direction of derivation. The assumption of this methodological operating stance, makes for straightforward investigation of the MH from a crosslinguistic perspective.

Having clarified the formal nature of the MH and the methodological approach, I then proposed the empirical domain of states and changes of state as an ideal testing ground for the MH. I began by justifying the decompositional representations I assume for them, which I believe are uncontroversial given much previous work on the topic. Assuming the stance of Taking Morphology Seriously, the MH then makes a number of straightforward, empirically falsifiable predictions about the derivational relationship of words naming states to words naming changes of state, the strongest two of which are repeated in (2).

(2) a. Words naming states are never derived from words naming changes of state.
  b. Words naming non-causative COS events are never derived from words naming causative COS events.

These predictions follow straightforwardly from the decompositional implementation of the MH and from the standard decompositional representations of states, changes of state, and causative changes of state justified in Chapter 2. The prediction in (2a), that words naming states are never derived from words naming changes of state, follows from the MH in that such a derivation would involve the deletion of CAUSE and BECOME operators. The prediction in (2b) that words naming non-causative changes of state are never derived from words naming causative changes of state follows from the MH in that such a derivation would again involve the deletion of an operator, in this case a CAUSE operator. The core chapters of the dissertation examined these strong predictions in detail.

Part II of the dissertation was devoted to an examination of the first prediction, (2a). In Chapter 3, I began the investigation by observing that not all states are semantically identical, and that this observation coupled with the MH leads to a more nuanced prediction about the derivational relationship of words naming states to words naming changes of state. While some state-denoting words, so-called *result states*, entail that there was a prior event giving rise to the state named by the word, others, what have often been called *property concept states* following Dixon (1982), do not. I proposed a difference in the decompositional representations of these two kinds of states in light of this contrast that has precedents in prior work. In particular, while the decompositional representation of result states includes an existentially bound preceding event (Piñón 1999; Kratzer 2000), property concept states do not. Given this contrast in decompositional representation, the MH leads to the prediction that words naming these two kinds of states should show contrasting derivational behavior—it is words naming property concept states that, in line with (2a), are predicted never to be derived from words naming changes into those states. By contrast, words naming result states, which include an existentially bound event as part of their decompositional representation, *are* predicted to be derived from words naming changes of state. Data from languages like Quechua, Eastern Armenian, Tongan, and Pima, not to mention English, are shown to support this prediction.

The predictions are not without challenges, however, and these present themselves in both directions. On the one hand, Tagalog seems to pose a challenge to the prediction that words naming result states are derived from words naming changes of state. In this language, the opposite appears to be the case—in descriptions of the language due to Foley and Van Valin (1984), it appears that words naming result states with meanings like 'disappeared' are morphologically simple, with words naming changes of state with meanings like 'disappear' derived from these. Further investigation, however, reveals that the situation is more complicated and that in fact, the morphologically simple words in question do not name result states. Instead, in the case of the morphologically complex verb with the meaning 'disappear', evidence suggests that the word from which it is derived has a meaning more like 'to not exist', rather than 'disappeared.' Tagalog, then, is shown to behave exactly as predicted by the MH, once a better understanding of the lexical semantics of the words in question is achieved.

I then laid out data suggesting a counterexample in the other direction. In Ulwa, an endangered Misumalpan language spoken in Nicaragua, words naming property concept states are morphologically complex, and appear to be derived from morphologically simple roots naming causative changes of state. This state of affairs, unlike the Tagalog case, cannot be attributed to incomplete understanding of the lexical semantics of the state-denoting words—they are unambiguously property concept denoting, not result state denoting. Chapter 4 gave an overview of my work on Ulwa and of salient aspects of Ulwa grammar with Chapters 5 and 6 devoted to untangling the derivational relationship between words naming property concept states and words naming COS events in the language. In order to show exactly how Ulwa challenges the prediction in (2a), I first laid out the morphological verb class system of Ulwa in Chapter 5, providing a full-scale reanalysis of Ulwa verb class morphology on the basis of newly collected data from eleven months of fieldwork.

With this new understanding of the Ulwa verb class system as background, I show how the words for property concept states appear to be derived from roots naming changes into those states, in apparent violation of the prediction of the MH in (2a). In Chapter 6 I then showed that contrary to initial appearances, the words for these property concept states are not derived from roots naming changes into the states. Instead, the function of the suffix appearing on words naming property concept states is to change the syntactic category of the root to which it suffixes—it derives nouns from lexemes of indeterminate syntactic category. I offer a number of syntactic arguments showing that these morphologically complex words naming property concept states are indeed nouns, rather than adjectives, as previously presumed (Hale and Salamanca 2002; Green 1999). Further, I present additional evidence in favor of the roots upon which these property concept state denoting nouns are built being state-denoting, rather than COS-denoting, with the COS-denoting uses of the roots the result of zero derivation. In addition to explaining the synchronic morphosyntactic behavior of property concept state denoting words in Ulwa, the finding that these words are nouns, rather than adjectives, explains otherwise curious facts regarding the historical morphosyntax of nouns and adjectives in the Misumalpan languages more broadly. In the course of this discussion, I also provide a detailed description of the morphosyntax of both Ulwa verb classes and Ulwa property concept state words. More importantly in the context of this dissertation, the discussion reveals the Ulwa facts to be consistent with the predictions of the MH, despite initial appearances to the contrary. Based, then, on the findings in Chapter 6 and the detailed examination of the Ulwa facts, I conclude that the strong prediction of the MH in (2a) is indeed borne out.

In Part III I turned attention to examination of the prediction in (2b), that words naming non-causative changes of state are never derived from words naming causative changes of state. In Chapter 7 I showed that for many types of events in many languages, consistent with the strong prediction of the MH, words naming causative COS events are derived from words naming non-causative COS events. For other types of events, however, the reverse direction of derivation is often observed, with the word naming the non-causative COS event derived from the word naming the causative COS event, as in the Spanish *quebrar* 'break (causative)' versus *quebrar se* 'break (inchoative).' In such a derivation, it appears as though the derivational operation is responsible for deleting a CAUSE operator from the lexical semantic representation of a causative in order to derive an inchoative, in direct violation of the MH. This kind of derivational operation, commonly referred to in the literature as *anticausativization*, poses perhaps the most pressing empirical challenge to the MH.

I began the investigation in Chapter 7 by laying out the basic facts of anticausativization that any comprehensive analysis of the phenomenon must capture. This was followed by a critical review of previous analyses of the phenomenon. The most obvious and widely-accepted analysis of anticausativization is one whereby the word-formation operation deriving inchoative verbs from causative COS verbs deletes a CAUSE operator from the lexical semantic representation, in violation of the MH. I showed that such an analysis fails to capture a wide-range of facts about the phenomenon, among others: the fact that the morphological marker of anticausativization is almost always also a marker of reflexivization (Haspelmath 1990); that not all causative verbs participate in the alternation; and most surprisingly in Chapter 8, that contrary to widely held beliefs dating to the foundational studies of the causative/inchoative alternation, sentences headed by a causative verb do not entail sentences headed by the corresponding inchoative verb.

Instead, I showed in Chapter 8 that the empirically best analysis of anticausativization is one that treats anticausativization as a semantic reflexivization operation. Building on Chierchia (2004), I develop a detailed analysis of anticausativization as reflexivization drawing on Davidsonian event semantics. This analysis, I showed, captures the wide range of facts laid out earlier. Completely independent of the MH, then, the reflexivization analysis is the empirically most adequate analysis of anticausativization. Additionally, on this analysis the CAUSE operator is retained in the decomposition of derived inchoatives, consistent with the MH, and with its strong prediction in (2b). I offered a number of empirical arguments showing that contrary to received wisdom, derived inchoatives do indeed have causative semantics, consistent with this analysis, and consistent with the MH. In this way, despite initial appearances to the contrary, anticausativization is perfectly consistent with the MH.

Having argued in detail from both language particular and crosslinguistic perspectives that the predictions of the MH in (2) are indeed borne out in the domain of states and changes of state, in Part IV I moved beyond the discussion of states and changes of state, turning my attention in Chapter 9 to predictions made by the MH in other empirical domains. For any pair of derivationally related words, once the lexical semantics of the words in question can be well established, the MH makes clear predictions about possible and impossible derivational relationships. Chapter 9 lays out some of the phenomena which I believe future investigation of the MH from a crosslinguistic perspective should focus on. Among these are: the relationship of manner verbs (e.g., *run*) to manner plus path verbs (e.g., *run to*); contrasts in the behavior of manner verbs (e.g., *run*) and result verbs (e.g., *break*); the derivational relationship of result nouns like *a break* to verbs naming the event giving rise to the result like *break*; the derivational relationship crosslinguistically of pairs of nouns and verbs that in English are zero related, but may not be in other languages, e.g., *a paddle* and *to paddle*; and augmentative and diminutive derivations. These all will, I argue, contribute toward better understanding of constraints on the semantics of word formation operations, and more specifically of the MH.

10.2 Major results and areas for future research

The main contribution of this dissertation has been to draw attention to the semantic side of word formation operations, an area that has previously received very little attention. I have shown that the Monotonicity Hypothesis, a widely assumed, but never tested hypothesis about the semantic side of word formation operations, holds of a particular empirical domain in a strong way. This alone is a welcome result, given the wide-spread assumption of the MH in a diverse range of theoretical frameworks. The contributions of this dissertation, however, go beyond this area, and suggest a number of areas for future research, some of which I outline in this section.

10.2.1 The Monotonicity Hypothesis, the Principle of Compositionality, and context-free lexical semantics

In Chapter 2, I briefly touched on other higher level principles of grammar from which the MH might follow, focusing most closely on the Principle of Compositionality. I came at this question from a particular perspective, however, that suggests an area for significantly broadening research on the MH. Specifically, I took Dowty's (2006) work on context-free semantics as a point of departure. Although Dowty's original discussion focused on semantic composition at the sentential level, I suggested that also treating the semantics of word-formation as context-free could have desirable consequences, specifically in that the MH might follow. I did not, however, discuss any other reasons (empirical or otherwise), independent of the MH or Dowty's considerations, for why the semantics of word formation might be context-free.

There is at least one potential reason discussed in Chapter 3 (and glossed over to a large degree) that might motivate a move to the much stronger constraint of context-free lexical semantics (with the MH as a consequence). With the MH, the question arises what specifically counts as an operator, such that the MH precludes its deletion. Operators in the decompositional literature are typically conceived of as objects such as CAUSE and BECOME. In the discussion of result states in Chapter 3, however, I considered the existential quantifier in the representation of result states, illustrated in (3) for the result state named by *reddened*, to be an operator falling under the purview of the MH.

(3) $[\![reddened]\!] =$
$\lambda x \lambda s \exists e[BECOME(e,s) \wedge red(s) \wedge THEME(s,x)]$

From this followed the prediction, borne out by the data in Chapter 3, that words naming result states can be derived from words naming changes of state, but never vice versa. As previously mentioned, however, existential quantifiers do not seem like decompositional operators of the traditional kind and interpreting them in this way might rightly be seen as questionable. If we consider the semantics of word formation to be constrained by the context-free desideratum, then the claimed prediction follows much more straightforwardly—while there could be a context-free operation that saturates the event argument, existentially binding it, there could be no context-free operation that "undoes" the saturation.

A parallel case, where moving to context-free lexical semantics might have interesting consequences, is the relationship between active and passive forms of verbs. The passive form of a verb might reasonably be seen as having some kind of existentially bound argument that remains unsaturated in the corresponding active form of the verb. If this is correct, then context-free lexical semantics might lead to the prediction that while passives could be derived from actives, actives could never be derived from passives. I do not know at present whether this (potentially) predicted asymmetry holds up to crosslinguistic investigation, but it seems like something worth pursuing in future research, especially in the context of further investigation of context-free lexical semantics.

If indeed semantic composition at the level of word formation is context-free, there should be many other consequences; and if semantic composition at the level of word formation does turn out to be context-free, then this would be a non-trivial finding, shedding much light on the nature of the semantic side of word formation operations. It is not at all obvious, however, that context-free semantic word formation can hold up to a broad range of data from a wide variety of languages. In sentential semantics, for example, as pointed out in Chapter 2, context-free semantics faces serious challenges from phenomena such as propositional attitude verbs (Cresswell 1985; Chierchia 1989). Future research should explore the extent to which such challenges exist for the semantics of word formation, and if not, what the differences are between the semantics of word formation and sentential semantics such that this is the case.

10.2.2 Semantic composition below and above the word level

Discussion in Chapter 2 raises further questions regarding potential differences between semantic composition below and above the word level, which suggest interesting areas for future research that will almost certainly shed further light on the semantic nature of word formation operations.

Among the central topics broached in Chapter 2 was what kinds of set-theoretic operations are observed in word-formation. What was much less discussed, however, was how these observations compare to the kinds of set-theoretic operations observed in sentential compositional semantics, and whether the two might differ fundamentally in the nature of set-theoretic operations available to each domain. For example, it was observed that in sentential semantics disjunction takes two propositions as arguments, creating a new proposition that is a superset of each of the propositions from which the new, larger one was formed. At the level of word formation, however, no such operation was observed. An interesting question for future research is whether this is a true gap, or whether there in fact do exist word formation operations that expand the denotation of the lexeme upon which they operate. More broadly, the question is whether semantic composition below and above the word level is the same or different.

Such research is of basic importance in furthering the understanding of the semantics of word formation. At the same time, however, it potentially has consequences that extend far beyond the semantics of word formation to the decades-long debate over lexicalism in syntax (Chomsky 1970; Bresnan and Mchombo 1995; Marantz 1997; Embick 2004). If it turned out that the kinds of compositional operations observed below the word level and above the word level were in fact identical, it seems to me that this would constitute a rather strong argument in favor of a non-lexicalist approach to syntax, since on such a view, there should be no distinction between composition below the level of the word (such objects not really existing in the first place) and above the level of the word. If, however, it turned out (as appears to be the case on the basis of the very preliminary observations in Chapter 2) that the kinds of compositional operations available to word formation operations and to sentential compositional semantics were, in fact, different, then such a finding would seem to be more in line with the predictions of a lexicalist approach to syntax. The discussion in Chapter 2 barely begins to touch the surface of this question. Because of its importance to the study of the semantics of word formation operations specifically and also its broader implications, it is a topic that I believe should receive serious attention in future research.[1]

[1] In fact, as pointed out in Chapter 2, it is surprising that this topic has not received attention in previous literature; so far as I can tell, however, this is a neglected topic, most likely as a consequence of the neglect of the semantic side of word formation operations more generally.

10.2.3 Taking morphology seriously

Although I have not touched on it much since the discussion in Chapter 2, the methodological approach discussed there under the guise of "Taking Morphology Seriously" (TMS) has been pervasive throughout this dissertation, and, I believe, can be credited with many of its results. For example, TMS leads to the conclusion that in anticausativization, the intransitive, which is morphologically marked, is derived from the transitive, which is morphologically simple. As shown in Chapter 8, a number of other independent considerations lead to the same conclusion.

This methodological approach, although standard in typological studies like those of Nedjalkov and Silnitsky (1973), Croft (1990), and Haspelmath (1993), for example, is not universally adhered to in the generative literature. The results of this dissertation can perhaps be seen as illustrating the utility of this approach in generative oriented approaches to linguistic inquiry that are concerned with typological questions.

10.2.4 Ulwa

Beyond the core theoretical contributions to the study of the semantics of word formation operations, this dissertation also represents an advance in the study of the grammar of Ulwa. Among the more substantial achievements of Chapters 4–6 were: laying out the first substantial description of the sentential *ka* particle in the language, which seems to be implicated in some system of modality or evidentiality; giving a detailed analysis of derived property concept words, which, ultimately, I showed to be nouns; and giving a full-fledged reanalysis of the lexical semantics of Ulwa verb class morphology based on a much wider range of data than was considered or available in the previous work of Hale and colleagues (Hale and Salamanca 2002; Hale and Keyser 2002). In addition to the theoretical consequences in the context of this dissertation, the last of these has broader consequences in light of the role that Ulwa has played in the development of recent theories of argument structure, which I broach in Koontz-Garboden (2006e). Much remains, of course, to give a comprehensive documentation to the language.

Moving beyond the synchronic description of Ulwa, the results of the Ulwa discussion also offer areas to build on the program begun by others in recent years of trying to better understand the diachronic relationship not only of the Misumalpan languages to one another (Benedicto and Hale 2000), but also of the Misumalpan languages to the Chibchan languages more broadly (Craig and Hale 1992). In this area, the results of the descriptive discussion of property concept words in Ulwa suggest a promising area for future research. In Chapter 6, I showed that derived property concept words are nouns in Ulwa, and that, not only in Ulwa, but in the closely related Misumalpan language Mayangna, the same suffix used for third person singular possessive marking appears on property concept words. Further, I made the argument, building on Green (1992), that what look like attributive constructions in Ulwa, and Misumalpan more broadly, are in fact not attributive constructions, but instead internally headed relative clauses with the property concept word serving as the main predicate of the relative clause.

In at least one Chibchan language, Ika, spoken in northeastern Columbia (Frank 1990), the situation appears to be similar. In Ika not only are property concept words used in internally headed relative clauses, as shown in (4a), but they also must be used with a copular element *kawa* 'seem', as can be seen in (4a,b). In short, property concept words in Ika cannot predicate without copular material and in most cases cannot be used attributively at all (Frank 1990:19ff.).

(4) Property concept words in Ika

a. aná?nuga aʌn? kawa guákʌ-ža
animal big seem kill-MED
'It kills big animals (or, It kills animals that are big).'

b. Juansitu warin kawa ni
Juancito tall seem CERT
'Juancito is tall.' (Frank 1990:20)

Future work on the diachronic relationship of the Misumalpan and Chibchan languages might focus on property concept words. The fact that Ika, like Ulwa, uses internally headed relative clauses as opposed to attributive modification and has a marker appearing immediately after the property concept word that is at least phonologically superficially much like the Ulwa *–ka* (and from which *–ka* could easily be derived diachronically), while possibly accidential, seems worthy of future attention in the context of this understudied area of Native American historical linguistics.

10.2.5 Anticausativization

Anticausativization, in contrast with other operations like passive, is both understudied and not well-understood, and I believe one of the major contributions of this dissertation has been to demystify it to some degree. I have done this first by simply laying out in a single place the wide range of facts that are known about it, but which have never previously been considered together. In this way, I have shown what an adequate analysis of it must account for, and further, I believe I have provided such an analysis. At the same time, though, there are still basic facts of the phenomenon that remain poorly understood and which require much more work, as my investigation has revealed. Among these areas are the inferential relationship between sentences headed by causative and inchoative verbs, particularly in languages lacking a passive operation, since passive and anticausative are easily confused with one another and have radically different entailments. This leads to a further area in need of clarification—the differences between passive and anticausative. While I believe I have been much more explicit about the differences between passive and anticausative than previous literature, the differences require further exploration, and this is an area where useful contributions could be made that would have implications not only on formal analysis, but on general typological issues as well.

10.3 Parting remarks

In addition to drawing attention to the Monotonicity Hypothesis, which was previously assumed generally only implicitly, this dissertation has offered extensive empirical support for it. Along the way, I gave a reanalysis to Ulwa verb classes and contributed to the documentation of this language by describing and analyzing in detail property concept words, which I show to have a number of theoretically interesting properties. In arguing for the MH, I also have undertaken a full-scale reanalysis of the phenomenon of anticausativization, which although a commonly discussed phenomenon, is one that I believe to have previously been poorly understood. At the same time, I have shown that the MH makes many predictions in many different empirical domains, suggesting areas for fruitful future crosslinguistic research which I hope will lead to further exploration of the MH, of context-free lexical semantics more generally, and ultimately to deeper understanding of constraints on the semantics of word formation.

Bibliography

AIKHENVALD, ALEXANDRA. 2004. Evidentiality. Oxford: Oxford University Press.

ALEXIADOU, ARTEMIS, and ELENA ANAGNOSTOPOULOU. 2004. Voice morphology in the causative-inchoative alternation: Evidence for a non-unified structural analysis of unaccusatives. In The unaccusativity puzzle: Explorations of the syntax-lexicon interface, ed. by Artemis Alexiadou, Elena Anagnostopoulou, and Martin Everaert, 114–136. Oxford: Oxford University Press.

——, ——, and FLORIAN SCHÄFER. 2006. The properties of anti-causatives crosslinguistically. In Phases of interpretation, ed. by Mara Frascarelli, 187–211. Berlin: Mouton de Gruyter.

ALPHER, BARRY, and KENNETH L. HALE. n.d. On relativization in Miskito. Sydney University and MIT, ms.

ANDREWS, AVERY. 1990. Unification and morphological blocking. Natural Language and Linguistic Theory 8.507–557.

ARAD, MAYA. 2003. Locality constraints on the interpretation of roots: The case of Hebrew denominal verbs. Natural Language and Linguistic Theory 21.737–778.

——. 2005. Roots and patterns: Hebrew morpho-syntax. Dordrecht: Springer.

ARONOFF, MARK. 1976. Word formation in generative grammar. Cambridge, MA: MIT Press.

——. 1994. Morphology by itself. Cambridge, MA: MIT Press.

——, and Frank Anshen. 1998. Morphology and the lexicon: Lexicalization and productivity. In Handbook of morphology, ed. by Andrew Spencer and Arnold M. Zwicky, 237–247. Oxford: Blackwell.

Asudeh, Ash, and Ida Toivonen. 2006. Response to David Adger's 'Remarks on Minimalist feature theory and Move'. Journal of Linguistics 42.675–686.

Baker, Mark C. 2003. Lexical categories: Verbs, nouns, and adjectives. Cambridge: Cambridge University Press.

Bauer, Winifred. 1993. Maori. London: Routledge.

Beard, Robert. 1995. Lexeme-morpheme base morphology. Albany: State University of New York Press.

——. 1998. Derivation. In Handbook of morphology, ed. by Arnold Zwicky and Andrew Spencer, 44–65. Oxford: Blackwell.

Beavers, John. 2006. Thematic roles and argument/oblique alternations. Stanford, CA: Stanford University dissertation.

——, and Andrew Koontz-Garboden. 2006. A universal pronoun in English? Linguistic Inquiry 37.503–513.

Beck, David. 2002. The typology of parts of speech systems: The markedness of adjectives. Outstanding Dissertations in Linguistics. New York: Routledge.

Benedicto, Elena, and Ken Hale. 2000. Mayangna, a Sumu language: Its variants and its status within Misumalpan. In Indigenous languages, ed. by Elena Benedicto, volume 20. Amherst, MA: University of Massachusetts Occassional Papers in Linguistics.

Bhat, D.N. 1994. The adjectival category: Criteria for differentiation and identification. Amsterdam: John Benjamins.

BIERWISCH, MANFRED. 1986. On the nature of semantic form in natural language. In Human memory and cognitive capabilities: Mechanisms and performances, ed. by F. Klix and H. Hagendorf, 765–784. Amsterdam: Elsevier (North-Holland).

——. 2002. A case for CAUSE. In More than words: A festschrift for Dieter Wunderlich, ed. by Ingrid Kaufmann and Barbara Stiebels, 327–354. Berlin: Akademie Verlag.

BOOIJ, GEERT, and ROCHELLE LIEBER. 2004. On the paradigmatic nature of affixal semantics in English and Dutch. Linguistics 42.327–357.

BRESNAN, JOAN, and SAM A. MCHOMBO. 1995. The Lexical Integrity Principle: Evidence from Bantu. Natural Language and Linguistic Theory 13.181–252.

BROUSSEAU, ANNE-MARIE, and ELIZABETH RITTER. 1991. A non-unified analysis of agentive verbs. In Proceedings of the Tenth West Coast Conference on Formal Linguistics, ed. by Dawn Bates, 53–64. Stanford, CA: CSLI Publications.

BYBEE, JOAN. 1985. Morphology: A study of the relation between meaning and form. Amsterdam: John Benjamins.

——, REVERE PERKINS, and WILLIAM PAGLIUCA. 1994. The evolution of grammar: Tense, aspect, and modality in the languages of the world. Chicago, IL: University of Chicago Press.

CAMPBELL, LYLE. 1997. American Indian languages: The historical linguistics of Native America. Oxford: Oxford University Press.

CANN, RONNIE. 1993. Formal semantics: An introduction. Cambridge: Cambridge University Press.

CARSTAIRS-MCCARTHY, ANDREW. 1992. Current morphology. New York: Routledge.

CARTER, RICHARD J. 1976. Some constraints on possible words. Semantikos 1.27–66.

—— 1978. Arguing for semantic representations. Recherches Linguistiques 5–6.61–92. Reprinted in Beth Levin and Carol Tenny (eds.) 1988. *On Linking: Papers by Richard Carter*. Lexicon Project Working Papers 25, Center for Cognitive Science, MIT, Cambridge, MA.

CENTINEO, GIULIA. 1995. The distribution of *si* in Italian transitive/inchoative pairs. In Proceedings of Semantics and Linguistic Theory 5, 54–71. Ithaca, NY: Cornell Linguistics Circle.

CHIERCHIA, GENNARO. 1984. Topics in the syntax and semantics of infinitives and gerunds. Amherst, MA: University of Massachusetts dissertation. References to 1988 Garland published version.

——. 1989. Structured meanings, thematic roles and control. In Properties, types and meaning, ed. by Gennaro Chierchia, Barbara H. Partee, and Raymond Turner, 131–166. Dordrecht: Kluwer.

——. 2004. A semantics for unaccusatives and its syntactic consequences. In The unaccusativity puzzle, ed. by Artemis Alexiadou, Elena Anagnostopoulou, and Martin Everaert, 22–59. Oxford: Oxford University Press. Previously circulated as unpublished 1989 Cornell University manuscript.

——, and SALLY MCCONNELL-GINET. 2000. Meaning and grammar: An introduction to semantics. Cambridge, MA: MIT Press.

CHOMSKY, NOAM. 1964. Current issues in linguistic theory. The Hague: Mouton.

——. 1970. Remarks on nominalization. In Readings in English transformational grammar, ed. by Roderick Jacobs and Peter Rosenbaum, 184–221. Waltham, MA: Ginn.

——. 2005. Three factors in language design. Linguistic Inquiry 36.1–22.

CHURCHWARD, C. MAXWELL. 1953. Tongan grammar. London: Oxford University Press.

——. 1959. Tongan dictionary: Tongan-English and English-Tongan. London: Oxford University Press.

CIDCA. 1985. Miskitu bila aisanka/Gramática Mískita. Managua: Centro de Investigaciones y Documentación de la Costa Atlántica.

Clark, Eve V. 1993. The lexicon in acquisition. Cambridge: Cambridge University Press.

——, and Herbert H. Clark. 1979. When nouns surface as verbs. Language 55.767–811.

Cole, Peter. 1982. Imbabura Quechua. Amsterdam: North Holland.

Constenla Umaña, Adolfo. 1991. Las lenguas del area intermedia: Introducción a su estudio areal. San José, Costa Rica: Editorial de La Universidad de Costa Rica.

Craig, Colette. 1990. Rama kuup: Gramática Rama. Managua: Centro de Investigaciones y Documentación de la Costa Atlántica.

——, and Kenneth Hale. 1992. A possible macro-Chibchan etymon. Anthropological Linguistics 34.173–201.

Cresswell, M.J. 1985. Structured meanings: The semantics of propositional attitudes. Cambridge, MA: MIT Press.

Croft, William. 1990. Possible verbs and the structure of events. In Meanings and prototypes, ed. by Savas L. Tsohatzidis, 48–73. London: Routledge.

Cusihuaman, Antonio. 1976. Gramática Quechua: Cuzco-Collao. Lima, Perú: Ministerio de Educación, Instituto de Estudios Peruanos.

Davidson, Donald. 1967. The logical form of action sentences. In The logic of decision and action, ed. by Nicholas Rescher, 81–95. Pittsburgh, PA: University of Pittsburgh Press.

de Swart, Henriëtte. 1998. Aspect shift and coercion. Natural Language and Linguistic Theory 16.347–385.

DeLancey, Scott. 1984. Notes on agentivity and causation. Studies in Language 8.2.181–213.

Deo, Ashwini. 2006. Tense and aspect in Indo-Aryan languages: Variation and diachrony. Stanford, CA: Stanford University dissertation.

Dixon, R.M.W. 1972. The Dyirbal language of North Queensland. Cambridge: Cambridge University Press.

—— 1982. Where have all the adjectives gone?: And other essays in semantics and syntax. The Hague: Mouton.

—— 2004. Adjective classes in typological perspective. In Adjective classes: A cross-linguistic typology, ed. by R.M.W. Dixon and Alexandra Y. Aikhenvald, 1–49. Oxford: Oxford University Press.

Donohue, Cathryn. 2004. Morphology matters: Case licensing in Basque. Stanford, CA: Stanford University dissertation.

Doron, Edit. 2003. Agency and voice: The semantics of Semitic templates. Natural Language Semantics 11.1–67.

Dowty, David. 1978. Governed transformations as lexical rules in a Montague grammar. Linguistic Inquiry 9.393–426.

——. 1979. Word meaning and Montague grammar. Dordrecht: D. Reidel Publishing.

——. 1989. On the semantic content of the notion 'thematic role'. In Properties, types, and meaning, ed. by Gennaro Chierchia, Barbara H. Partee, and Raymond Turner, volume II: Semantic Issues, 69–130. Dordrecht: Kluwer.

——. 1991. Thematic proto-roles and argument selection. Language 67.547–619.

——. 2006. Compositionality as an empirical problem. To appear in Papers from the Brown University Conference on Direct Compositionality, ed. by Chris Barker and Pauline Jacobson. Oxford: Blackwell.

——, Robert Wall, and Stanley Peters. 1981. Introduction to Montague semantics. Dordrecht: D. Reidel Publishing.

Dressler, Wolfgang U., and Lavinia Merlini Barbaresi. 1994. Morphopragmatics: Diminutives and intensifiers in Italian, German, and other languages. Berlin: Mouton de Gruyter.

Dubinsky, Stanley, and Silvester Ron Simango. 1996. Passive and stative in Chichewâ: Evidence for modular distinctions in grammar. Language 72.749–781.

Embick, David. 2004. On the structure of resultative participles in English. Linguistic Inquiry 35.355–392.

Evans, Bethwyn. 2003. A study of valency-changing devices in proto-Oceanic. Canberra: Pacific Linguistics.

——, and Malcolm Ross. 2001. The history of proto-Oceanic *ma–. Oceanic Linguistics 40.269–290.

Evans, Nicholas. 2004. Experiencer objects in Iwaidjan languages. In Non-nominative subjects, ed. by Peri Bhaskararao and Karumuri Venkata Subbarao, volume 2, 77–100. Amsterdam: John Benjamins.

Everett, Daniel L. 2001. Monolingual field research. In Linguistic fieldwork, ed. by Paul Newman and Martha Ratliff, 166–188. Cambridge: Cambridge University Press.

Faller, Martina. 2002. Semantics and pragmatics of evidentials in Cuzco Quechua. Stanford, CA: Stanford University dissertation.

Faltz, Leonard M. 1985. Reflexivization: A study in universal syntax. New York: Garland Publishing.

Fillmore, Charles. 1970. The grammar of hitting and breaking. In Readings in English transformational grammar, ed. by Roderick Jacobs and Peter Rosenbaum. Waltham, MA: Ginn.

Finer, Daniel L. 1984. The formal grammar of switch-reference. Amherst, MA: University of Massachusetts dissertation.

Flobert, Pierre. 1975. Les verbes déponents Latins des origènes à Charlemagne. Number 17 in NS Recherches. Paris: Société d'Édition Les belles lettres.

Fodor, Jerry. 1970. Three reasons for not deriving 'kill' from 'cause to die'. Linguistic Inquiry 1.429–438.

Foley, William A., and Robert D. Van Valin. 1984. Functional syntax and universal grammar. Cambridge: Cambridge University Press.

Folli, Raffaella. 2001. Constructing telicity in English and Italian. Oxford: University of Oxford dissertation.

Frank, Paul. 1990. Ika syntax. Dallas, TX: Summer Institute of Linguistics.

Fukuda, Shin. 2006. The projection of telicity in Vietnamese. Paper presented at the 37th meeting of the Northeast Linguistic Society, October 13-15, Urbana-Champaign, IL.

Garcia, Erica C. 1975. The role of theory in linguistic analysis: The Spanish pronoun system. Amsterdam: North-Holland.

Garrett, Andrew. 2006. Paradigmatic uniformity and markedness. In Explaining linguistic universals: Historical convergence and universal grammar, ed. by Jeff Good. Oxford University Press. In press.

Geniušienė, Emma. 1987. The typology of reflexives. Berlin: Mouton de Gruyter.

Givón, Talmy. 1984. Syntax: A functional-typological introduction. Amsterdam: John Benjamins.

GRAHEK, SABINA. 2002. Alternating unaccusative verbs in Slovene. In Leeds working papers in linguistics and phonetics, ed. by Diane Nelson, volume 9, 57–72. Leeds, U.K.: University of Leeds, School of Modern Languages and Cultures: Linguistics and Phonetics. `http://www.leeds.ac.uk/linguistics/WPL/WPL9.html`.

GREEN, THOMAS. 1992. Covert clause structure in the Miskitu noun phrase. Unpublished MIT ms.

——. 1999. A lexicographic study of Ulwa. Cambridge, MA: MIT dissertation.

——, and KENNETH L. HALE. 1998. Ulwa, the language of Karawala, eastern Nicaragua: Its position and prospects in modern Nicaragua. International Journal of the Sociology of Language 132.185–201.

GREENBERG, JOSEPH. 1987. Language in the Americas. Stanford, CA: Stanford University Press.

GRIMSHAW, JANE. 1982. On the lexical representation of Romance reflexive clitics. In The mental representation of grammatical relations, ed. by Joan Bresnan, 87–148. Cambridge, MA: MIT Press.

——. 1990. Argument structure. Cambridge, MA: MIT Press.

——. 2005. Words and structure. Stanford, CA: CSLI Publications.

GUERSSEL, MOHAMED, KENNETH HALE, MARY LAUGHREN, LEVIN BETH, and JOSIE WHITE EAGLE. 1985. A cross-linguistic study of transitivity alternations. In Proceedings of the 21st Annual Meeting of the Chicago Linguistic Society, volume 2: Parasession on Causatives and Agentivity, 48–63. Chicago, IL: Chicago Linguistic Society.

HAIMAN, JOHN. 1985. Natural syntax. Cambridge: Cambridge University Press.

HALE, KENNETH L. 1991a. El ulwa, sumu meridional: ¿Un idioma distinto? Wani 11.27–50.

—— 1991b. Misumalpan verb sequencing constructions. In Serial verbs: Grammatical, comparative, and cognitive approaches, ed. by Claire Lefebvre, 1–35. Amsterdam: John Benjamins.

—— 1997. The Misumalpan causative construction. In Essays on language function and language type, ed. by Joan Bybee, John Haiman, and Sandra A. Thompson, 199–216. Amsterdam: John Benjamins.

—— 2001. Ulwa (Southern Sumu): The beginnings of a language research project. In Linguistic fieldwork, ed. by Paul Newman and Martha Ratliff, 76–101. Cambridge: Cambridge University Press.

——, and Samuel Jay Keyser. 1987. A view from the middle. Lexicon Project Working Papers 10, Center for Cognitive Science, MIT, Cambridge, MA.

——, and Samuel Jay Keyser. 1998. The basic elements of argument structure. In Papers from the UPenn/MIT roundtable on argument structure and aspect, volume 32, 73–118. MITWPL.

——, and Samuel Jay Keyser. 2002. Prolegomenon to a theory of argument structure. Cambridge, MA: MIT Press.

——, and Danilo Salamanca. 2002. Theoretical and universal implications of certain verbal entries in dictionaries of the Misumalpan languages. In Making dictionaries, ed. by William Frawley et al., 25–59. Berkeley, CA: University of California Press.

Härtl, Holden. 2003. Conceptual and grammatical characteristics of argument alternations: The case of decausative verbs. Linguistics 41.883–916.

Haspelmath, Martin. 1987. Transitivity alternations of the anticausative type. Institut für Sprachwissenschaft, Universität zu Köln.

——. 1990. The grammaticization of passive morphology. Studies in Language 14.25–72.

——. 1993. More on the typology of inchoative/causative verb alternations. In Causatives and transitivity, ed. by Bernard Comrie and Maria Polinsky, 87–120. Amsterdam: John Benjamins.

——. 2005. Universals of causative verb formation. LSA Institute class handout, August 2, 2005. Cambridge, MA.

HAVILAND, JOHN B. 1994. "Te xa setel xulum" [The buzzards were circling]: Categories of verbal roots in (Zinacantec) Tzotzil. Linguistics 32.691–741.

HIGGINBOTHAM, JAMES. 1985. On semantics. Linguistic Inquiry 16.547–593.

HOLM, JOHN. 1978. The creole English of Nicaragua's Miskito coast. London: University of London, University College dissertation.

HORN, LAURENCE. 2005. An *un-* paper for the unsyntactician. In Polymorphous linguistics, ed. by Salikoko Mufwene, Elaine J. Francis, and Rebecca S. Wheeler, 329–365. Cambridge, MA: MIT Press.

HORVATH, JULIA, and TAL SILONI. 2002. Against the "little-v" hypothesis. Rivista di Grammatica Generativa 27.107–122.

JACKENDOFF, RAY. 1975. Morphological and semantic regularities in the lexicon. Language 51.639–671.

——. 1983. Semantics and cognition. Cambridge, MA: MIT Press.

——. 1990. Semantic structures. Cambridge, MA: MIT Press.

——. 1993. X-bar semantics. In Semantics and the lexicon, ed. by James Pustejovsky, 15–26. Dordrecht: Kluwer.

——. 1997. The architecture of the language faculty. Cambridge, MA: MIT Press.

JACKSON, ERIC M. 2004. State-deriving suffixes in Pima. Handout of talk given at the Stanford Syntax Workshop, June 9, 2004.

—— 2005. Resultatives, derived statives, and lexical semantic structure. Los Angeles, CA: UCLA dissertation.

JACOBSON, STEVEN A. 1984. Yup'ik Eskimo dictionary. Fairbanks, AL: Alaska Native Language Center.

—— 1995. A practical grammar of the Central Alaskan Yup'ik Eskimo language. Fairbanks, AL: Alaska Native Language Center.

JUARROS, EVA. 2003. Argument structure and the lexicon/syntax interface. Amherst, MA: University of Massachusetts dissertation.

KALLULLI, DALINA. 2006a. On unaccusative morphology and argument realization. University of Vienna, ms.

——. 2006b. Rethinking the passive/anticausative distinction. University of Vienna, ms.

——. 2006c. Unaccusatives with dative causers and experiencers: A unified account. In Datives and other cases: Between argument structure and event structure, ed. by Daniel Hole, André Meinunger, and Werner Abraham, 271–301. Amsterdam: John Benjamins.

KATZ, GRAHAM. 2003. Event arguments, adverb selection, and the stative adverb gap. In Modifying adjuncts, ed. by Ewald Lang, Claudia Maienborn, and Cathrine Fabricius-Hansen, 455–474. Berlin: Mouton de Gruyter.

KEENAN, EDWARD. 1985. Passive in the world's languages. In Language typology and syntactic description, ed. by Timothy Shopen, volume 1, 242–281. Cambridge: Cambridge University Press.

KEMMER, SUZANNE. 1993. The middle voice. Amsterdam: John Benjamins.

KIPARSKY, PAUL. 1973. Phonological representations. In Three dimensions of linguistic theory, ed. by Osamu Fujimura. Tokyo: TEC.

——. 1982. Word-formation and the lexicon. In Proceedings of the 1982 Mid-America Linguistic Conference, ed. by F. Ingeman, 3–29.

——. 1997. Remarks on denominal verbs. In Argument structure, ed. by Alex Alsina, Joan Bresnan, and Peter Sells, 473–499. Stanford, CA: CSLI Publications.

——. 2001. Structural case in Finnish. Lingua 111.315–376.

——. 2002. Event structure and the perfect. In The construction of meaning, ed. by David Beaver, Luis Casillas Martínez, Brady Clark, and Stefan Kaufmann. Stanford, CA: CSLI Publications.

——. 2004. Blocking and periphrasis in inflectional paradigms. Yearbook of Morphology 2004.113–135.

KLAIMAN, M.H. 1991. Grammatical voice. Cambridge: Cambridge University Press.

KOONTZ-GARBODEN, ANDREW. 2004. Language contact and Spanish aspectual expression: A formal analysis. Lingua 114.1291–1330.

——. 2005. On the typology of state/change of state alternations. Yearbook of Morphology 2005.83–117.

——. 2006a. El estado actual del proyecto de la lengua Ulwa. Stanford University, ms .

——. 2006b. Monotonicity at the lexical semantics–morphosyntax interface. To appear in Emily Efner and Martin Walkow (eds.), Proceedings of the 37th meeting of the Northeast Linguistic Society. Amherst, MA: GLSA.

——. 2006c. The states in changes of state. In press Proceedings of the 32nd annual meeting of the Berkeley Linguistics Society.

——. 2006d. Two classes of intransitive verbs in Ulwa. Paper presented at 2006 annual meeting of the Society for the Study of the Indigenous Languages of the Americas. Albuquerque, New Mexico.

——. 2006e. Ulwa verb class morphology. Stanford University, ms. Under review.

——. 2007. Aspectual coercion and the typology of change of state predicates. Journal of Linguistics 43. In press.

——, and Beth Levin. 2005. The morphological typology of change of state event encoding. In Online proceedings of the Fourth Mediterranean Morphology Meeting (MMM4) Catania, 21-23 September 2003, ed. by Geert Booij, Emiliano Guevara, Angela Ralli, Salvatore Sgroi, and Sergio Scalise, 185–194. Università degli Studi di Bologna. `http://morbo.lingue.unibo.it/mmm/mmm4-proceedings.php`.

Kratzer, Angelika. 1996. Severing the external argument from its verb. In Phrase structure and the lexicon, ed. by Johan Rooryck and Laurie Zaring, 109–137. Dordrecht: Kluwer.

——. 2000. Building statives. In Proceedings of the 26th Meeting of the Berkeley Linguistics Society, 385–399. Berkeley, CA: Berkeley Linguistics Society.

Krifka, Manfred. 1998. The origins of telicity. In Events and grammar, ed. by Susan Rothstein, 197–235. Dordrecht: Kluwer.

Kroch, Anthony. 1994. Morphosyntactic variation. In Proceedings of the 30th annual meeting of the Chicago Linguistic Society, ed. by Katherine Beals et al., volume 2: The parasession on variation and linguistic theory, 180–201. Chicago, IL: Chicago Linguistic Society.

Kuryłowicz, Jerzy. 1964. The inflectional categories of Indo-European. Heidelberg: Carl Winter.

Labelle, Marie. 1992. Change of state and valency. Journal of Linguistics 28.375–414.

Lakoff, George. 1965. On the nature of syntactic irregularity. Bloomington, IN: Indiana University dissertation. Published 1970 as *Irregularity in syntax*. New York: Holt, Rinehart, and Winston.

Lakoff, Robin. 1971. Passive resistance. In Proceedings of the Seventh Annual Meeting of the Chicago Linguistic Society, 149–163. Chicago, IL: Chicago Linguistic Society.

LANDAU, IDAN. 2006. Ways of being rude. Ben Gurion University, ms. Available on author's website: `http://www.bgu.ac.il/~idanl/`.

LANGACKER, RONALD. 1986. Abstract motion. In Proceedings of the 12th Annual Meeting of the Berkeley Linguistics Society, 455–471. Berkeley, CA: Berkeley Linguistics Society.

LARSON, RICHARD. 1999. Semantics of adjectival modification. Lectures presented at the Dutch National Graduate School (LOT), Amsterdam, The Netherlands. Notes available on author's website at: `http://semlab5.sbs.sunysb.edu/~rlarson/LOT(99)/Contents.htmld/`.

LEVIN, BETH. 1993. English verb classes and alternations: A preliminary investigation. Chicago, IL: University of Chicago Press.

——. 2001. Externally and internally caused eventualities. Handout of Ling. 232A Class Lecture, Stanford University.

——, and MALKA RAPPAPORT HOVAV. 1995. Unaccusativity: At the syntax-lexical semantics interface. Cambridge, MA: MIT Press.

——, and MALKA RAPPAPORT HOVAV. 1998. Morphology and lexical semantics. In Handbook of morphology, ed. by Arnold Zwicky and Andrew Spencer, 248–271. Oxford: Blackwell.

——, and MALKA RAPPAPORT HOVAV. 1999. Two structures for compositionally derived events. In Proceedings of Semantics and Linguistic Theory 9, 199–223. Ithaca, NY: Cornell Linguistics Circle.

——, and MALKA RAPPAPORT HOVAV. 2003. Roots and templates in the representation of verb meaning. Handout of talk at the Department of Linguistics, Stanford University, May 15, 2003.

——, and MALKA RAPPAPORT HOVAV. 2005. Argument realization. Cambridge: Cambridge University Press.

LEVINSON, STEPHEN. 2000. Presumptive meanings: The theory of generalized conversational implicature. Cambridge, MA: MIT Press.

LIEBER, ROCHELLE. 1980. On the organization of the lexicon. Cambridge, MA: MIT dissertation.

——. 1998. The suffix *–ize* in English: Implications for morphology. In Morphology and its relation to phonology and syntax, ed. by Steven G. Lapointe, Diane K. Brentari, and Patrick M. Farrell, 12–34. Stanford, CA: CSLI Publications.

——. 2004. Morphology and lexical semantics. Cambridge: Cambridge University Press.

LIN, JIMMY. 2004. Event structure and the encoding of arguments: The syntax of the Mandarin and English verb phrase. Cambridge, MA: MIT dissertation.

LJUNG, MAGNUS. 1977. Problems in the derivation of instrumental verbs. In Perspektiven der wortbildungsforschung, ed. by Herbert E. Brekle and Dieter Kastovsky, 165–179. Bonn: Bouvier Verlag Herbert Grundmann.

LONGACRE, ROBERT E. 1985. Sentences as combinations of clauses. In Language typology and syntactic description: Complex constructions, ed. by Timothy Shopen, volume 2, 235–286. Cambridge: Cambridge University Press.

MAIENBORN, CLAUDIA. 2005. On the limits of the Davidsonian approach: The case of copula sentences. Theoretical Linguistics 31.275–316.

MANZINI, MARIA RITA. 1983. On control and control theory. Linguistic Inquiry 14.421–446.

MARANTZ, ALEC. 1984. On the nature of grammatical relations. Cambridge, MA: MIT Press.

——. 1997. No escape from syntax: Don't try morphological analysis in the privacy of your own lexicon. In Proceedings of the 21st Annual Penn Linguistics Colloquium, volume 4.2 of University of Pennsylvania Working Papers in Linguistics, 201–225.

MARCHAND, HANS. 1964. A set of criteria for the establishing of derivational relationship between words unmarked by derivational morphemes. Indogermanische Forschungen 69.10–19.

MARCOTTE, J.P. 2005. Causative alternation errors in child language acquisition. Stanford, CA: Stanford University dissertation.

MARUŠIČ, FRANC, and ROK ŽAUCER. 2005. On the intensional FEEL-LIKE construction in Slovenian: A case of a phonologically null verb. To appear in Natural Language and Linguistic Theory. Stony Brook University and University of Ottawa, ms.

MATSUMOTO, YO. 1996. Subjective motion and English and Japanese verbs. Cognitive Linguistics 7.183–226.

MCCARTHY, JOHN, and ALAN PRINCE. 1998. Prosodic morphology. In Handbook of morphology, ed. by Arnold Zwicky and Andrew Spencer, 283–305. Oxford: Blackwell.

MCCAWLEY, JAMES. 1968. Lexical insertion in a transformational grammar without deep structure. In Proceedings of the Fourth Regional Meeting of the Chicago Linguistic Society, 71–80. Chicago, IL: Chicago Linguistic Society.

——. 1978. Conversational implicature and the lexicon. In Pragmatics (Syntax and semantics 9), ed. by Peter Cole, 245–259. New York: Academic Press.

MCKOON, GAIL, and TALKE MACFARLAND. 2000. Externally and internally caused change of state verbs. Language 76.833–858.

——, and ——. 2002. Event templates in the lexical representation of verbs. Cognitive Psychology 45.1–44.

MEGERDOOMIAN, KARINE. 2002. Beyond words and phrases: A unified theory of predicate composition. Los Angeles, CA: University of Southern California dissertation.

MENDIKOETXEA, AMAYA. 1999a. Construcciones con *se*: Medias, pasivas e impersonales. In Gramática descriptiva de la lengua Española, ed. by Ignacio Bosque and Violeta Demonte, 1631–1722. Madrid: Editorial Espasa.

——. 1999b. Construcciones inacusativas y pasivas. In Gramática descriptiva de la lengua Española, ed. by Ignacio Bosque and Violeta Demonte, 1575–1629. Madrid: Editorial Espasa.

Michaelis, Laura A. 2004. Type shifting in construction grammar: An integrated approach to aspectual coercion. Cognitive Linguistics 15.1–67.

Mittwoch, Anita. 1988. Aspects of English aspect: On the interaction of perfect, progressive, and durational phrases. Linguistics and Philosophy 11.203–254.

Moens, Marc, and Mark Steedman. 1988. Temporal ontology and temporal reference. Computational Linguistics 14.15–28.

Mohanan, K.P., Tara Mohanan, and Lionel Wee. 1999. Introduction. In Grammatical semantics: Evidence for structure in meaning, ed. by Tara Mohanan and Lionel Wee, 1–22. Stanford, CA: CSLI Publications.

Montague, Richard. 1970. Universal grammar. Theoria 36.376–398.

——. 1973. The proper treatment of quantification in ordinary English. In Approaches to natural language, ed. by K.J.J. Hintikka, J.M.E. Moravcsik, and P. Suppes, 221–242. Dordrecht: D. Reidel Publishing. References to reprinted version in Paul Portner and Barbara Partee (eds.) 2002. Formal semantics: The essential readings. Oxford: Blackwell. Pp. 17-34.

Nedjalkov, Vladimir P. 1969. Nekotorye verojatnostnye universalii v glagol'nom slovoobrazovanii. In Jazykovye universalii i lingvisticheskaja tipologija, ed. by I.F. Vardul, 106–114. Moscow: Nauka.

——, and G.G. Silnitsky. 1973. The typology of morphological and lexical causatives. In Trends in Soviet theoretical linguistics, ed. by Ferenc Kiefer, 1–32. Dordrecht: D. Reidel Publishing.

Newmark, Leonard, Philip Hubbard, and Peter Prifti. 1982. Standard Albanian: A reference grammar for students. Stanford, CA: Stanford University Press.

NICHOLS, JOHANNA, DAVID PETERSON, and JONATHAN BARNES. 2004. Transitivizing and detransitivizing languages. Linguistic Typology 8.149–212.

NORWOOD, SUSAN. 1997. Gramática de la lengua Sumu. Managua: CIDCA.

PARSONS, TERENCE. 1990. Events in the semantics of English: A study in subatomic semantics. Cambridge, MA: MIT Press.

PERLMUTTER, DAVID. 1978. Impersonal passives and the Unaccusative Hypothesis. In Proceedings of the Fourth Annual Meeting of the Berkeley Linguistics Society, 157–189. Berkeley, CA: Berkeley Linguistics Society.

PESETSKY, DAVID. 1995. Zero syntax: Experiencer and cascades. Cambridge, MA: MIT Press.

PETERSON, DAVID. 1999. Discourse-functional, historical, and typological aspects of applicative constructions. Berkeley, CA: University of California dissertation.

PIÑÓN, CHRISTOPHER. 1999. Durative adverbials for result states. In Proceedings of the West Coast Conference on Formal Linguistics, 420–433. Somerville, MA: Cascadilla Press.

——. 2001a. A finer look at the causative-inchoative alternation. In Proceedings of Semantics and Linguistic Theory 11. Ithaca, NY: Cornell Linguistics Circle. References to prepublication manuscript on WWW at: `http://www.phil-fak.uni-duesseldorf.de/~pinon/papers/flcia.html`.

——. 2001b. Modelling the causative-inchoative alternation. Linguistische Arbeitsberichte 76.273–293.

PINKER, STEVEN. 1989. Learnability and cognition: The acquisition of argument structure. Cambridge, MA: MIT Press.

POLINSKAJA, MARIJA S. 1988. Stative, resultative, perfect, and passive in Tongan. In Typology of resultative constructions, ed. by Vladimir P. Nedjalkov, 289–301. Amsterdam: John Benjamins. English translation edited by Bernard Comrie.

POTTS, CHRISTOPHER. 2005. The logic of conventional implicatures. Oxford: Oxford University Press.

PUSTEJOVSKY, JAMES. 1992. The syntax of event structure. In Lexical and conceptual semantics, ed. by Beth Levin and Steven Pinker, 47–82. Cambridge, MA: Blackwell. Reprinted from Cognition 41.

——. 1995. The generative lexicon. Cambridge, MA: MIT Press.

PYLKKÄNEN, LIINA. 2000. On stativity and causation. In Events as grammatical objects, ed. by Carol Tenny and James Pustejovsky, 417–445. Stanford, CA: CSLI Publications.

RAPPAPORT HOVAV, MALKA, and BETH LEVIN. 1998. Building verb meanings. In The projection of arguments: Lexical and compositional factors, ed. by Miriam Butt and Wilhelm Geuder, 97–134. Stanford, CA: CSLI Publications.

——, and ——. 2001. An event structure account of English resultatives. Language 77.766–797.

REHG, KENNETH L. 1981. Ponapean reference grammar. Honolulu: University Press of Hawaii.

REINHART, TANYA. 1996. Syntactic effects of lexical operations: Reflexives and unaccusatives. In OTS working papers. Downloaded from author's website: `http://www.let.uu.nl/~tanya.reinhart/personal/`.

——. 2002. The theta system: An overview. Theoretical Linguistics 28.229–290.

——. 2006. Causativization and decausativization. Handout of Paper presented at the meeting of the Israeli Association for Theoretical Linguistics, Jerusalem, July, 2006.

——, and TAL SILONI. 2005. The lexicon-syntax parameter: Reflexivization and other arity operations. Linguistic Inquiry 36.389–436.

ROEPER, THOMAS. 1987. Implicit arguments and the head-complement relation. Linguistic Inquiry 18.267–310.

ROSEN, CAROL. 1984. The interface between semantic roles and initial grammatical relations. In Studies in Relational Grammar 2, ed. by David Perlmutter and Carol Rosen, 38–77. Chicago, IL: University of Chicago Press.

ROTHSTEIN, SUSAN. 2004. Structuring events. Oxford: Blackwell.

SADLER, LOUISA, and ANDREW SPENCER. 1998. Morphology and argument structure. In Handbook of morphology, ed. by Arnold Zwicky and Andrew Spencer, 206–236. Oxford: Blackwell.

SCALISE, SERGIO. 1986. Generative morphology. Dordrecht: Foris.

SCHLADT, MATTHIAS. 2000. The typology and grammaticalization of reflexives. In Reflexives: Forms and functions, ed. by Zygmunt Frajzyngier and Traci S. Curl. Amsterdam: John Benjamins.

SELLS, PETER, ANNIE ZAENEN, and DRAGA ZEC. 1987. Reflexivization variation: Relations between syntax, semantics, and lexical structure. In Working papers in grammatical theory and discourse structure: Interactions of morphology, syntax, and discourse structure, ed. by Masayo Iida, Stephen Wechsler, and Draga Zec, 169–238. Stanford, CA: CSLI Publications.

SHIBATANI, MASAYOSHI. 1996. Applicatives and benefactives: A cognitive account. In Grammatical constructions, ed. by Masayoshi Shibatani and Sandra Thompson, 157–194. Oxford: Oxford University Press.

SIEGEL, MUFFY. 1976. Capturing the adjective. Amherst, MA: University of Massachusetts dissertation.

SIEWIERSKA, ANNA. 1984. The passive: A comparative linguistic analysis. London: Croom Helm.

SIMONS, MANDY. 1995. The binyan Hitpa'el decomposed: On the derivation and function of the Hebrew binyan Hitpa'el. In Proceedings of the Eleventh Annual Conference of the Israel Association for Theoretical Linguistics, 143–167.

SMITH, CARLOTA. 1970. Jespersen's 'move and change' class and causative verbs in English. In Linguistic and literary studies in honor of Archibald A. Hill, ed. by Mohammad A. Jazayery, Edgar C. Polomé, and Werner Winter, volume 2: Descriptive Linguistics, 101–109. The Hague: Mouton.

SMITH, MARCUS. 2005. Two classes of causative/unaccusative alternation. Handout of talk given at LASSO 2005.

——. 2006. Canalization of causative derivations. Paper presented at 2006 meeting of LSA, Albuquerque, New Mexico.

STIRLING, LESLEY. 1993. Switch-reference and discourse representation. Cambridge: Cambridge University Press.

STUMP, GREGORY T. 2002. Inflectional morphology: A theory of paradigm structure. Cambridge: Cambridge University Press.

SVENONIUS, PETER. 2006. Parameters of P. Handout of talk presented at the 21st Comparative Germanic Syntax Workshop, UC Santa Cruz, March 30, 2006.

TALMY, LEONARD. 1985. Lexicalization patterns. In Language typology and syntactic description, ed. by Timothy Shopen, volume 3, 57–149. Cambridge: Cambridge University Press.

——. 2000. Towards a cognitive semantics, volume 1: Concept structuring systems. Cambridge, MA: MIT Press.

THOMPSON, CHAD. 1996. The Na-Dene middle voice: An impersonal source of the d-element. International Journal of American Linguistics 62.351–378.

VAN VALIN, ROBERT D. 1990. Semantic parameters of split intransitivity. Language 66.221–260.

—— 2005. Exploring the syntax-semantics interface. Cambridge: Cambridge University Press.

——, and RANDY J. LAPOLLA. 1997. Syntax: Structure, meaning, and function. Cambridge: Cambridge University Press.

——, and DAVID P. WILKINS. 1996. The case for "effector": Case roles, agents and agency revisited. In Grammatical constructions: Their form and meaning, ed. by Masayoshi Shibatani and Sandra A. Thompson, 289–322. Oxford: Oxford University Press.

VAN VOORST, JAN. 1995. The semantic structure of causative constructions. Studies in Language 19.489–523.

VÁZQUEZ SOTO, VERÓNICA. 2001. Some constraints on Cora causative constructions. In The grammar of causation and interpersonal manipulation, ed. by Masayoshi Shibatani, 197–244. Amsterdam: John Benjamins.

VON WRIGHT, GEORG H. 1963. Norm and action. New York: Humanities Press.

—— 1968. An essay in Deontic logic and the general theory of action. Acta Philosophica Fennica. Amsterdam: North Holland.

WALSH, MICHAEL. 1987. The impersonal verb construction in Australian languages. In Language topics: Essays in honor of Michael Halliday, ed. by Ross Steele and Terry Threadgold, 425–438. Amsterdam: John Benjamins.

WEBER, DAVID. 1989. A grammar of Huallaga (Huánuco) Quechua. Berkeley, CA: University of California Press.

WECHSLER, STEPHEN. 2005. More problems for 'little v'—and a lexicalist alternative. Talk presented on October 11, 2005 at the Construction of Meaning Workshop, Stanford University.

WETZER, HARRIE. 1996. The typology of adjectival predication. Berlin: Mouton de Gruyter.

WIERZBICKA, ANNA. 1980. Lingua mentalis: The semantics of natural language. Sydney: Academic Press Australia.

WRIGHT, SAUNDRA. 2001. Internally caused and externally caused change of state verbs. Evanston, IL: Northwestern University dissertation.

——. 2002. Transitivity and change of state verbs. In Proceedings of the 28th meeting of the Berkeley Linguistics Society. Berkeley, CA: Berkeley Linguistics Society.

WUNDERLICH, DIETER. 1997a. Argument extension by lexical adjunction. Journal of Semantics 14.94–142.

——. 1997b. Cause and the structure of verbs. Linguistic Inquiry 27–68.

YOUNG, PHILIP, and TALMY GIVÓN. 1990. The puzzle of Ngäbére auxiliaries: Grammatical reconstruction in Chibchan and Misumalpan. In Studies in typology and diachrony: For Joseph H. Greenberg, ed. by William Croft, Keith Denning, and Suzanne Kemmer, 207–243. Amsterdam: John Benjamins.

ZUCCHI, ALESSANDRO. 1993. The language of propositions and events: Issues in the syntax and the semantics of nominalization. Dordrecht: Kluwer.

——. 1998. Aspect shift. In Events and grammar, ed. by Susan Rothstein, 349–370. Dordrecht: Kluwer.