COMPLEX CAUSATIVES AND VERBAL VALENCE

DISSERTATION

in

Linguistics

For my mother

Helga Ebersberger (1942–2005)

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ABSTRACT

COMPLEX CAUSATIVES AND VERBAL VALENCE

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This dissertation studies complex causative predicates, like 'pound flat,' in relation to a question of verbal valence, with a focus on Igbo, Mandarin, and English. When a noun phrase enters a thematic relation with a nearby verb, does that relation project from the verb, or is it introduced by its structural context? Despite the attention given to this question, its answers are often hard to distinguish empirically. Yet complex causatives can provide a sharp diagnostic for the valence of verbs that occur in them. In English they suggest that agent and patient relations typically project from the verb. In Igbo and Mandarin, they show clearly that the typical verb has no arguments lexically. Agent and patient relations are introduced by structures extrinsic to the verb and, in the case of complex causatives, extrinsic to the complex predicate as a whole. Principles that relate the distribution of arguments to predicate meaning are correspondingly stated over structures larger than individual verb roots. These conclusions simplify the description of thematic interpretation and transitivity alternations in complex causatives, and the account of cross-linguistic differences in these same areas. Theoretically, they underscore one central point. The valence of a verb is not a trivial consequence of its meaning. Verbs that describe the same event can nonetheless differ in the number of participants they have as lexical arguments. The thesis also examines the typology of word order in complex causatives, based on a broad survey of languages, including Malayalam, Japanese, Edo, Vietnamese, Nosu Yi, and others. It shows that variation derives from whether the predicate that describes the result of causation is a head or a phrase.

Contents

Acknowledgements **iii**

Abstract **v**

Contents **vi**

1 Complex causatives and verbal valence **1**

1.1 Overview of the thesis 1

1.2 Complex causatives 8

1.3 Projectionist and nonprojectionist models 12

1.3.1 The two models described simply 12

1.3.2 Lexical valence is not lexical meaning 15

1.3.3 What is a lexical argument of the verb? 20

1.4 The relevance of CCs 24

1.5 Outlines of the semantic derivation 28

1.5.1 Introducing the agent and patient relations 29

1.5.2 Introducing the *CAUSE* relation 33

1.5.3 On the combinations of M and R 38

1.6 Outlines of the syntactic analysis 40

1.6.1 CCs are built in syntax 40

1.6.2 On the position of the object 43
1.6.3 Inside M and R 49

2 The No Argument Theory **53**

2.1 Introduction 53
2.2 English CCs and verbal valence 54
2.3 Arguments in Igbo and Mandarin 59
2.3.1 Unrealized patients 59
2.3.2 Patients in unexpected places 65
2.3.3 Agents, missing or displaced 70
2.3.4 Summary of the data 73
2.4 The No Argument Theory 75
2.5 Attractions and alternatives 80
2.6 Size does not matter 84
2.7 Meaning and the distribution of patients 88
2.8 Conclusions 93
2.9 Back to English CCs 96
2.9.1 The derivation of CCs in English 96
2.9.2 Apparent exceptions to the UPP in English 102

3 Intransitive complex causatives **115**

3.1 Introduction 115
3.1.1 Overview of the chapter 115
3.1.2 Intransitive CCs in Igbo and Mandarin 118
3.2 The Direct Object Restriction 125
3.2.1 Introducing the Direct Object Restriction in English 125
3.2.2 An argument for the DOR from the UPP 127

3.2.3 Subject-control CCs are nonagentive 129
3.2.4 Explaining the causer/controller disjunction 137
3.2.5 The DOR and the causer/controller disjunction 140
3.2.6 Implementing the DOR 143
3.2.7 The DOR cross-linguistically 147
3.2.8 Spurious CCs 150
3.2.9 Final comments on the DOR 155
3.3 Intransitive CCs and the NAT 156
3.3.1 Uniform projection in English intransitive CCs 157
3.3.2 The lack of uniform projection in Mandarin and Igbo 159
3.3.3 Against valence-reducing operations in Igbo CCs 168
3.3.4 On the distribution of agents 170
3.3.5 Subject-control CCs with a postverbal NP 189
3.3.6 Summary 197
3.4 Matching arguments and subevents 197

4 Word order in complex causatives **201**
4.1 Introduction 201
4.2 Continuity and the size of R 204
4.2.1 Patterns in the data 205
4.2.2 Explaining the pattern 213
4.2.3 Alternatives and their problems 218
4.2.4 Continuous order in the OV languages 224
4.3 Verb order and the size of R 227
4.3.1 Order and the category of R 229
4.3.2 Order and the size of R 237

4.3.3 Explaining the order of verbs in OV languages 239
4.4 The case of Yi 244
4.5 Conclusion 252

5 Final remarks **253**
5.1 Complex causatives and verbal valence 253
5.2 The Mandarin potential form 255

Bibliography **266**

Chapter 1

Complex causatives and verbal valence

1.1 Overview of the thesis

This thesis is about *complex causatives*, like English (1), Mandarin (2), and Igbo (3).

(1) Al pounded the cutlet flat.

(2) tā tī duàn -le nàtiáo mùbǎn.
3s kick snap -PFV that plank
'S/he made that plank snap by kicking.'[1]

[1]Mandarin is a Sinitic language and the national language in both mainland China and Taiwan. In glosses of Mandarin, PFV stands for 'perfective,' and PRT for 'sentence final particle.' One common PRT morpheme has the same pronunciation as PFV: [lʌ], written le. Sometimes it can be disputed whether le realizes PFV or this PRT. Since nothing relevant to this work depends on which choice is correct, I simply gloss le as LE in these cases. NMOD glosses -de, a toneless phrasal enclitic which attaches to adnominal modifiers. BA glosses ba, the morpheme which marks the so-called *ba*-construction; the noun phrase following ba is interpreted as the patient of the event of the VP that immediately follows it.

In my transcriptions, I use hyphens *only* to indicate that a morpheme is intrinsically an affix or a clitic. Thus I will not add a hyphen to a free morpheme that happens to be pronounced within a single phonological word, as in the case of the two verbs that make a complex causative.

(3) Ọ kụ wa -ra ọba ahụ.
3sS strike split -FACT gourd that
'S/he made that gourd split by striking.'[2]
(Hale, Ihiọnụ, and Manfredi 1995, tr. AW)

I study these constructions, which are often called resultatives,[3] in relation to a basic question in verbal grammar. When there is a thematic relation between (the meanings) of a noun phrase and a nearby verb, as there is between the subject or object and pound in (4) for instance, what introduces that relation? The verb itself, or something in the context where the verb occurs?

(4) Al pounded the cutlet.

In the first case, we treat the noun phrase as instantiating a lexical argument of the verb, satisfying it lexical valence. In the second, we don't.

[2]Igbo ([iɓo]) is a Benue-Congo (or Eastern Kwa) language, and is among the national languages of Nigeria; see Swift et al. 1962, Green and Igwe 1963, Emenanjọ 1978, Nwachukwu 1987, Ụwalaka 1988, Manfredi 1991, and Igwe 1999.

Glosses of Igbo use the following abbreviations. FACT means 'factative'; roughly, a predicate in the factative has past time reference when eventive and nonpast time reference when stative. BVC means 'bound verb cognate' (see Nwachukwu 1987 and Emenanjọ 1978). The BVC is a nominalization of the verb group, derived by prefixation of a low unrounded vowel; in all the data presented here, it is used solely to satisfy the requirement that a verb group in the factative not be clause-final (Nwachukwu 1987: 19–21). PROG means 'progressive,' SBRD means 'subordinate verb prefix,' and P means 'all-purpose preposition.' DSP stands for 'default subject prefix.' This prefix appears when a subject clitic surfaces postverbally (as it may for the first-singular and third-plural), and in impersonals, where there is neither a subject clitic marking person, nor a full NP subject.

My use of hyphens in transcriptions of Igbo follows the convention described in footnote 1. In this case I depart from what is typical in the Igbo orthography, which typically writes multimorphemic phonological words as single orthographic words, even when the component morphemes are not clitics or affixes. Because of the complexity of Igbo tonology, I omit reference to tones.

Unless attributed to other sources, the Igbo data I present in this dissertation come from primary research I conducted with native speakers from Nigeria, now living in the Philadelphia area.

[3]I avoid the term 'resultative' because it has a second common usage. It also names a type of derived stative, describing a state that naturally results from the event of the verb stem (Nedjalkov 1988). This second kind of resultative is exemplified in English by the so-called adjectival passive: 'The ground floor button is already *pushed*.' With the term 'complex causative,' I highlight a similarity between *complex* causative predicates like pound flat or polish smooth, and what are called *simple* causative predicates like flatten or (to) smooth (cp. Embick 2004). Both sorts describe a change of state; but complex causatives tell us what kind of event caused the change.

This question of verbal valence has received active attention over the past two decades. The view that argument relations 'project' from the verb has long been dominant; see e.g. Chomsky 1981, Bresnan 1982, Klein and Sag 1985, Dowty 1989, Steedman 1997, and Joshi 2004. As an attraction, its proponents advertise this feature: by localizing all information about clausal structure in the verb, the rules for assembling a clause are kept simple. But challenges favoring some role for the verbal context have become increasingly common, and better understood; see Marantz 1984, Carlson 1984, Borer 1994, Goldberg 1995, Kratzer 1996, Marantz 1997, Rothstein 2001, Borer 2003, and Pietroski 2004.

Yet the two ways of modeling a thematic relation, as projecting from the verb or as imposed by its context, are hard to distinguish empirically. In most cases, the description of the facts seems equally simple (or complex) under both models, and a theoretical premise invoked to make the call is itself under dispute.[4]

I believe that the complex causatives of Mandarin and Igbo provide a case where the facts are decisive. The grammar of these constructions demonstrates that, characteristically in these languages, neither agents nor patients are lexical arguments of the verb. Rather, basic thematic relations are introduced by the structure in which the verb occurs. And correspondingly, principles regulating the distribution of agents and patients are stated not over individual verb roots, but over verbal predicates more generally. This is what I call the *No Argument Theory* for Igbo and Mandarin,

[4]Kratzer's 1996 argument that agents are not arguments of the verb has been very influential. It relies on an observation made in Marantz 1984. Roughly, there are no idiomatic collocations that involve just the verb and an agent argument, to the exclusion of a patient argument. Kratzer then derives her conclusion via a further premise: idiomatic meanings must be stated over *lexical* representations. The facts are then explained, concludes Kratzer, if the the lexical representation of the verb contains no reference to an agent. Yet the crucial additional premise is left behind by Marantz himself in his 1997 paper. He assumes that idiomatic semantic relations may be stated over structures built in syntax, within a narrow domain of locality. And if one accepts this, Kratzer's argument loses its force. If idiomatic relations can be stated over syntactic structures, then facts about idioms don't necessarily tell us anything about lexical representations.

or NAT, and it is the central conjecture of this thesis.

If I am right, the question of verbal valence, of whether or not a verb has a certain thematic relatum as a lexical argument, is decided by the facts of the particular language. It is not decided once and for all by general principles. In particular, the valence of a verb is not decided trivially by its meaning, i.e. by what sort of event it describes. Even if the event of a verb necessarily involves a patient, for example, the verb need not have a patient as a lexical argument (cf. Kratzer 2003). Sometimes it will (generally in English) and sometimes it won't (generally in Igbo and Mandarin). This represents a departure from what seems to be the normal view in the field. I hope to show why the facts make it necessary.

In pursuing this issue of argument structure and meaning, I develop a basic syntax for complex causatives. Three of its premises are important: (i) the verb describing the 'means' of causation combines directly with the secondary predicate describing its 'result'; (ii) the minimal complex causative predicate excludes the direct object; and (iii) the 'result' predicate varies in size: sometimes it is phrasal, and sometimes it is just a head. These premises find initial support in simple facts of distribution internal to the language, like where adverbs can occur. And later we'll see that only (i–iii) directly predict how basic word order varies, both within a language and universally. But their deepest justification is in allowing a simple semantic structure for complex causatives, one that is both compositionally strict and cross-linguistically general.

In all cases, my conclusions will derive from a comparative perspective. I take it that cross-linguistically common features in the grammar of complex causatives should be emphasized, and described in terms of the same principles, whenever possible. Where languages differ, the difference should be located on a dimension of variation known independently to exist, and without predicting further differences that are not attested. Research on complex causatives, in English or Igbo or Man-

darin, has not benefited sufficiently from this sort of approach. Failure to appreciate both the scope and the limits of cross-linguistic difference has obscured important generalizations. Fundamentally, my motivation here is to bring these to light.

The core of the thesis is chapter 2, where I first establish the NAT. I compare the requirements associated with a verb in simple clauses with those manifested in complex causatives. In English, verbs must enter the same pattern of thematic relations in both environments (Dowty 1979, Carrier and Randall 1992, Levin and Rappaport 1995), exhibiting what I call the *uniform projection property*, or UPP. If a verb must find a patient in the direct object in a simple clause, for example, then the same is true in a complex causative. But Igbo and Mandarin lack the UPP. Requirements imposed on a verb in simple clauses are systematically absent when it occurs in a complex causative. This is explained, I argue, only if the simple clause dependencies do not express requirements of the verb itself—that is, if the argument noun phrases, subject or object, do not instantiate lexical arguments of the verb. My emphasis will be on patients. More often than agents, patients are treated as arguments of the verb, and strong conceptual support has been given for this decision, notably in Kratzer 2003. This chapter can be seen as a counterargument, based on the distributional facts of Igbo and Mandarin.

In chapter 2 I deal only with transitive complex causatives, like (1–3). Intransitives, like those in (5–7), are the topic of chapter 3, which has two large parts.

(5) The lake froze solid.

(6) neìge haízi dòng bìng -le.
that child freeze be ill -LE
'That kid got ill from freezing.' (Ma 1987: 439; tr. AW)

(7) Osisi ahụ da ji -ri adaji.
tree that fall snap -FACT BVC
'That tree got snapped from falling.'

The first part demonstrates that, once the UPP is recognized as an independent factor, it becomes clear that the "direct object restriction" (Simpson 1983, Levin and Rappaport 1995) is valid across languages. It is always the clause's underlying object that tells us who or what changes state in the event of the complex causative. Recent claims to the contrary (Y. Li 1995, Wechsler 1997, Rappaport Hovav and Levin 2001) either misunderstand the content of the restriction or wrongly extend its domain of application. The second part of the chapter presents more evidence for the NAT, from intransitive complex causatives in particular. Here the focus will be on agents. Whether or not a clause includes an argument identifying the agent of its event, we'll see, is not decided just by the meaning or the valence of the individual verbs that occur in it. Finally, at the end of the chapter, I observe that intransitive CCs do not refer to fewer events than do transitives, contra the suggestion in Rappaport Hovav and Levin 2001.

Chapter 4 turns to word order. Among VO languages, the object sometimes comes between the two predicates of a complex causative, as in English, and sometimes after both, as in Igbo or Mandarin. Among OV languages, the predicate describing the result of the event sometimes comes first, as in Kannada (8), and sometimes second, as in Ijọ (9).

(8) Hari tanna pyjamaga -lannu shubrav -aagi tol -id -a.
H. his pyjamas -ACC clean -ADV wash -PAST -3sm
'Hari washed his pyjamas clean.'

(9) Erí bẹ́lẹ sùrụ pámọ -mị.
he pot wash clean.CAUS -PAST
'S/he washed the pot clean.' (ex. & tr. Williamson 1965: 57)

Based on a survey of languages—not just from Sinitic, Benue-Congo, and Germanic, but also from Tibeto-Burman, Tai, Mon-Khmer, Dravidian, and Oceanic, along with Vietnamese and Japanese—I observe correlations between surface word order and the syntactic size of the result predicate. These correlations, I then show, follow quite naturally from the syntactic premises introduced and developed in the preceding chapters. Conversely, theories which depart from these premises, such as those in Déchaine 1993, Sybesma 1999, Collins 2002, or Carstens 2002, among others, render the observed patterns mysterious.

Jointly, chapters 1 through 4 will have provided a skeleton for complex causative structure across languages, and a simple way of describing differences: sometimes arguments are introduced structurally, and sometimes with the verb. The theory accommodates facts that are otherwise regarded as anomalous, while remaining conservative in its syntax and explicit in its semantics. In chapter 5, together with my concluding remarks, I indicate some outstanding difficulties for the NAT, which remain to be handled in future work.

In the rest of this first chapter, I further develop the terms of discussion. I begin in section 1.2 by outlining what complex causatives are, and how I will talk about them. Section 1.3 then describes what it means for an argument to be introduced by the verb, or by its context, with attention to the difference between meaning and valence. The main argument of chapters 2 and 3 is anticipated in section 1.4, which explains how complex causatives can be used to test for the valence of verbs within them. Finally, two long sections lay out my analytical premises in more detail, narrowing the space of theories I will consider, and the range of facts that will interest me. I discuss my semantic assumptions in section 1.5 and my syntactic assumptions in section 1.6.

1.2 Complex causatives

Complex causatives, henceforth CCs, are single clause constructions comprising two predicates, a *means predicate* (M) and a *result predicate* (R). Neither M nor R is introduced by a conjunction, adposition, or complementizer. (10) is an English example, where M is pound and R is flat.

(10) Al pounded the cutlet flat.

Semantically, CCs express a relation of causation between the eventualities described by M and R, without this relation being indicated by any overt morpheme: (10) says that pounding caused flatness (Dowty 1979, among many others). One aspect of this meaning is that some object changes state, entering the result condition defined by R. The phrase that names this object, I will say, *controls* R. In (10) the cutlet controls flat, since (10) entails that the cutlet became flat.

(11) and (12), which repeat (2) and (3), are CCs from Mandarin and Igbo. In (11) M is ti 'kick,' R is duàn 'snap,' and R is controlled by nàtiáo mùbǎn 'that plank.' The sentence says that pounding caused snapping, and what wound up snapped was the plank. (12) says that striking caused splitting, and what wound up split was the gourd. M here is kụ 'strike' and R is wa 'split.'

(11) tā tī duàn -le nàtiáo mùbǎn.
3s kick snap -PFV that plank
'S/he made that plank snap by kicking.'

(12) Ọ kụ wa -ra ọba ahụ.
3sS strike split -FACT gourd that
'S/he made that gourd split by striking.'

My glosses will follow a fixed format: 'SUBJECT made OBJECT R by M'ing.' Sometimes it will be more natural to say: 'SUBJECT made OBJECT R *from* M'ing.' But

this choice will not indicate a difference in the relation between the means and result events, which is causation whether I choose 'by' or 'from.'

What will interest me primarily are the understood thematic relations of subject and object to the event of M, the means event. In (10) Al names the agent of pounding and the cutlet names its patient. In (11) and (12) as well, the subject is the agent of the M event, and the object is the patient. But we will see in chapter 2 that Mandarin and Igbo differ from English in not requiring this particular pattern of relations. And this will form the basis of my central conclusion, that verbs are typically without arguments in Igbo and Mandarin.

We need to distinguish between what I will call *transitive* and *intransitive* CCs. In English the distinction is readily made in terms of surface syntax. Transitive CCs have a subject and an object, (13), while intransitive have only a (surface) subject, (14).

(13) a. Al pounded the cutlet flat.

b. Al yelled his throat hoarse.

(14) a. The lake froze solid.

b. The door swung shut.

But the criterion of the distinction, as I intend it, is in control of R. Control is by the object in transitives and the (surface) subject in intransitives. We will see in chapter 3 that this difference coincides with a more fundamental contrast in meaning. Transitive CCs include an argument, namely the subject, that is construed as the agent of causation, i.e. the 'causer.' But there is no reference to a 'causer' in intransitives (Y. Li 1995). Because control correlates in this way with meaning, it is a more useful criterion of classification in a cross-linguistic study, one which reveals generalizations that would otherwise be obscured by irrelevant differences in syntax.

Finally it will help to give some special attention to the form of CCs in Igbo and Mandarin, since it differs from that of the CC in English. In English, M is a verb but (the head of) R is not.[5] In Igbo and Mandarin, however, M and R are both verbs, roots that can serve as the sole predicate of a main clause without auxiliary support.[6] Thus the R predicates in (20) and (22) can head clauses on their own, (21) and (23). Notice that the R verb is moreover not constrained to be stative; in both these examples, it is eventive.

[5]In English R not only forbids verbs, it forbids even adjectives derived from verbs, i.e. participles (Green 1972). Embick 2004 proposes an explanation of this restriction; see section 3.2.6 chapter 3.

(15) a. Al pounded the cutlet flat/*flattened.
b. Al toasted the bagel black/*burned.

Because of these this, English lacks direct translation equivalents for many CCs found frequently in other languages. Cross-linguistically it is common to find predicates in R meaning 'break,' 'split,' or 'fall,' for example. Since English R excludes even the participles derived from verbs with these meanings—broken, split, fallen—we say (16a) instead of (16b), and (17a) instead of (17b).

(16) a. Al kicked the plank in two.
b. * Al kicked the plank split/broken.

(17) a. Al kicked the statue down/over.
b. * Al kicked the statue fallen.

The following quote from runway model Coralie Eicholtz, (18), shows the effects of this restriction. If English allowed participles in R, Ms. Eicholtz could have said (19) instead.

(18) "As Cameron [Diaz] leaped over our seats she accidentally trod on my dress, putting a big hole in it. I toppled over and fell on my face. So I gave her a right hook before my friends stepped in." (*Philadelphia Metro*, 21 June 2005, pg. 11)

(19) * Cameron Diaz accidentally trod my dress torn, and I toppled fallen.

[6]In Mandarin, a slim morphological distinction can be made between two kinds of verbs, *xíngróng-cí* 'descriptive words' and *dòng-cí* 'action words.' Both classes are large, and Rs can come from either. Because predicates of the former class generally translate to English adjectives, and the latter to English verbs, the distinction in Mandarin is often identified with the one in English, wrongly. Unlike English verbs and adjectives, 'descriptive words' and 'action words' are not distinguished in whether they can serve as the main predicate of a clause without auxiliary support (both can), or in whether they can serve as attributive modifiers to a noun, without formal marking (basically, neither can).

In Igbo, words that one might call adjectives, by virtue of their occurring as unmarked noun modifiers, never occur in R. The adjectives appear to be a subcategory of nouns: they have the vowel-initial shape typical of nouns, and their ability to occur as adnominal modifiers is shared by many nouns, including basic nouns like eze 'chief' (see e.g. Emenanjọ 1978, Hale et al. 1995, Igwe 1999). Only a few of the adjectival nouns, roughly eight (Adams 1932, Green and Igwe 1963,

(20) tā tī duàn -le nàtiáo mùbǎn.
3s kick snap -PFV that plank
'S/he made that plank snap by kicking it.'

(21) nàtiáo mùbǎn duàn -le.
that plank snap -PFV
'That plank snapped.'

(22) Ọ kụ wa -ra ọba ahụ.
3sS strike split -FACT gourd that
'S/he made that gourd split by striking it.'

(23) Ọba ahụ wa -ra awa.
gourd that split -FACT BVC
'That gourd split.'

In English, R is phrasal, in that it may contain modifiers in addition to its head, (24). But the head of R cannot be modified in Igbo and Mandarin, as shown for Mandarin in (25).[7] Thus R is a verbal head simply, and not a phrase.

(24) Al pounded the cutlet very flat.

(25) tā zá (*hěn) píng -le nàkuài ròu.
3s pound (*very) flat -PFV that meat
'S/he pounded that meat (*very) flat.'

Tense and aspect suffixes follow both verbs in Igbo and Mandarin, and do not attach to M independently. The direct object likewise follows both M and R, and cannot occur between them, (26, 27).

Schacter 1985), are lexically primitive. The rest can be derived from verbs by regular morphological processes; see Igwe 1999: XXXV–XLII.

[7]R cannot be adverbially modified in Igbo either, but it is harder to illustrate this quickly. In Igbo, a modifier of R—whether an adverbial noun, an adjunct PP, or a serialized VP—would not occur between the M and R verbs. But in any other position the modifier could modify the whole CC predicate. Thus one has to distinguish this interpretation from modification of R alone. This can be done, but it requires analytical detail not warranted by current purposes.

(26) * tā tī (-le) nàtiáo mùbǎn duàn (-le).
3s kick (-PFV) that plank snap (-PFV)
Intended: 'S/he made that plank snap by kicking.'

(27) * Ọ kụ (-rụ) ọba ahụ wa (-ra).
3sS strike (-FACT) gourd that split (-FACT)
Intended: 'S/he made that gourd split by striking.'

Because M and R are in this way inseparable, with neither noun phrases nor tense-aspect suffixes allowed between them, it is widely agreed that Igbo and Mandarin CCs are complex predicates. By this I mean that the M verb combines directly with R; it does not combine first with an object noun phrase, forming a verb phrase that excludes R (for Mandarin see e.g. Thompson 1973, Y. Li 1990, and Huang 1992, contra Hashimoto 1966; for Igbo see Lord 1975 and Hale, Ihiọnọ, and Manfredi 1995). The most common analysis for both languages is narrower still: neither M nor R contain any argument NPs. Thus R, like M, comprises just a verbal head. This accounts for the common designation of Igbo and Mandarin CCs as compounds of two verbs.[8]

Sections 1.5 and 1.6 lay out my assumptions about the semantic and syntactic structure of CCs in more detail.

1.3 Projectionist and nonprojectionist models

1.3.1 The two models described simply

Suppose that a noun phrase in a simple clause identifies a certain participant in the verb's event, as e.g. the direct object identifies the patient of pounding in (28).[9]

[8]Conveniently, CCs in Igbo and Mandarin are distinct in form from serial verb constructions with sequential or coordinative meaning. Constructions of the latter sort put an object NP *between* the two verbs. In many other languages typologically similar to Mandarin or Igbo, such as Thai and Yoruba, this is not true: there, CCs have the same word order as coordinative or sequential verb serializations, something which can complicate analysis.

[9]It is notoriously difficult to *define* what makes a clause 'simple' or 'basic.' But this is not a task we need to undertake here, because fundamentally, all that will matter is the *contrast* I indicate

There are basically two ways to model this, differing in how the thematic relation is introduced in deriving the semantic representation of the clause (see Carlson 1984, Dowty 1989, Kratzer 1996, Borer 2003).

(28) $[\![\ [_{\text{VP}}\ \textsf{pound the cutlet}\ ]\ ]\!] = \ldots \lambda e.[\mathit{pound}(e) \wedge \text{PAT}(e) = c \ldots]$

We might say that the patient relation is introduced by the lexical representation of the verb, perhaps by assigning the verb the denotation in (29); see section 1.3.3. In this case the patient relation *projects* from the verb, and the phrase that identifies the patient instantiates a *lexical argument of the verb*.

(29) $[\![\ \textsf{pound}\ ]\!] = \lambda y \ldots \lambda e.[\mathit{pound}(e)\ \wedge\ \text{PAT}(e) = y\ \ldots]$

Or we might say that the relation is not introduced by the verb, but by the structure in which it occurs. This might be done as in (30).[10] Then the noun phrase that identifies the patient of pounding, while it occupies an argument position in the clause, does not instantiate a lexical argument of the verb.

(30) a. $[\![\ \textsf{pound}\ ]\!] = \lambda e.\mathit{pound}(e)$

b. $[\![\ [_{\text{VP}}\ \text{V DP}\ ]\ ]\!] = \lambda e.[[\![\text{V}]\!](e)\ \wedge\ \text{PAT}(e) = [\![\text{DP}]\!]]$

I will call models of the first type *projectionist*, and models of the second type *non-projectionist*.

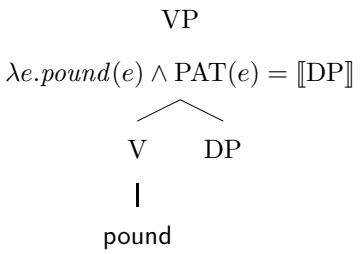
It may help to sketch the idea in tree form. (31) outlines a possible projectionist model for the patient relation observed in (28), and (32) a possible nonprojectionist

between a given complex causative clause and whatever clause I refer to as 'simple.'

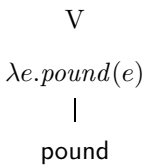
[10] It will be convenient to assume that Quantifier Raising applies to all DPs of quantificational type, $\langle\langle e,t\rangle,t\rangle$, leaving a trace in type $\langle e\rangle$. Then all DPs in argument positions denote uniformly in type $\langle e\rangle$, allowing equations like "$\text{PAT}(e) = [\![\text{DP}]\!]$." When I say that a DP 'identifies the patient (or agent) of event e,' therefore, I mean that it denotes an individual that instantiates the value of $\text{PAT}(e)$ (or $\text{AG}(e)$, respectively). But informally, I will use the same locution to describe any quantificational noun phrase which binds the trace that itself 'identifies a participant' in the strict sense. Nothing of great importance depends on my assumption of QR, and dropping it would require only obvious adjustments in how I say what I say.

model. Nodes are paired with their semantic interpretation, a graphical convention I will use throughout this work.

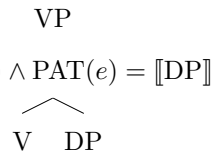
(31)



(32) a.



b.



The projectionist model, (31), associates a template for the semantic structure of the VP with the lexical representation of the verb. We can say that the verb *lexicalizes* that structure (see Joshi and Shabes 1997). In the nonprojectionist model, it does not. The verb itself tells us nothing about what relations it will enter, (32a). Instead, the semantic structure of VPs is described independently of any particular verb, as in (32b). This is one possible VP frame into which pound can be inserted.

Nonprojectionist models of purely syntactic relations are familiar. In a simple Context Free Grammar, for instance, the verb is assigned an unanalyzable category label. The grammar fragment in (33), for example, assigns pound the category Vt, (33a). But the category label itself encodes no information about where the verb can occur. Information about the distribution of Vt's is stated entirely in the rules of phrase structure, like (33b).

(33) a. $\text{Vt} \rightarrow \textsf{pound}$

b. $\text{VP} \rightarrow \text{Vt}\ \ \text{NP}$

My interest is in the distribution of verbs with respect to, not just NPs simply, but phrases with a particular thematic relation to the verb's event. In this more semantic domain, nonprojectionist models are less familar. But formally they are entirely analogous to the familiar nonprojectionist models of plain syntax, like CFGs.

I will be more specific about what it means for a verb to have have a lexical argument, and hence about how projectionist and nonprojectionist model differ, in sections 1.3.3 and 1.4. First we should see how they do *not* differ.

1.3.2 Lexical valence is not lexical meaning

The two models differ in how many lexical arguments they assign the verb. But they need not differ in how many participants they assign the event-type that the verb describes. If a verb has an argument to which it assigns a certain thematic relation, then it describes an event involving a participant who bears that relation. But the converse is not necessarily true. Compare (30a) and (29) for example, which I repeat here as (34) and (35).

(34) $[\![\ \textsf{pound}\ ]\!] = \lambda e.pound(e)$

(35) $[\![\ \textsf{pound}\ ]\!] = \lambda y \ldots \lambda e.[pound(e)\ \wedge\ \text{PAT}(e) = y\ \ldots]$

Given existential closure of y in (35), and any other variables that may be in the ellipsis, as in (36), each defines a predicate of events.

(36) Set of events described by **pound**, according to (35):
$\lambda e \exists y \ldots .[pound(e)\ \wedge\ \text{PAT}(e) = y\ \ldots]$

These two predicates, (34) and (36), do not necessarily differ in extension. Any event that verifies the predicate from (36) must have a patient; this is stated explicitly in the formula. But the same might be true of (34), albeit implicitly, if the metalanguage predicate *pound* is defined to have (37) as a consequence (see Dowty 1989: 85): every pounding has a patient. In that case (34) and (36) will describe exactly the same set of events, the set of poundings.

(37) $\forall e.[pound(e) \rightarrow \exists y.\mathrm{PAT}(e) = y]$

Thus the choice between projectionist and nonprojectionist models is primarily not semantic, in the strict sense, but grammatical. Given two theories of either sort which assign the verb the same type of event, with the same array of participants, which one yields the simpler and more explanatory grammar?

Yet it is sometimes suggested that, pursuant to some universal principle, a verb will have a lexical argument for each necessary participant in its event. "[A]s soon as you have relational concepts, you already have arguments," writes Kratzer (2003, Ch. 1, pg. 18), for example. The suggestion is this. If an eventuality as described by a verb V cannot be conceived without a relation to, say, a patient, then V will have a lexical requirement to cooccur with a phrase identifying the patient of its event. It will have a patient as a lexical argument. But of course this is not a priniciple of logic. Knowing that poundings have patients doesn't compel you to talk about them.[11] So Kratzer's suggested implication, from necessary participants to lexical arguments, is a substantive empirical hypothesis. And if my understanding of Igbo and Mandarin is correct, it is a hypothesis challenged by the facts of these languages.

[11]Fathers necessarily have children, but this leads no one to propose that the noun father has a lexical requirement to cooccur with a phrase identifying a child. Perhaps there is a reason why Kratzer's implication should apply to verbs, but not nouns. But if there is, that reason will itself constitute a theory of some substance; and the proposed correlation of conceptual relata and lexical arguments will follow from that theory, not anything more general.

Indeed the facts will invalidate a still stronger hypothesis. It is not even true that each necessary participant in the verb's event will be identified by an argument phrase in its clause, whether that phrase instantiates a lexical argument of the verb or not. Lidz, Gleitman, and Gleitman 2003 describe of study which, if they interpret it correctly, shows that this correlation is presupposed in the process of first language acquisition.[12] Yet at the same time, they acknowledge that the correlation is *not* respected in the adult language that is the output of acquisition, which in their study was Kannada. A Kannada verb whose event has n participants need not occur with n arguments identifying those participants, even in basic clauses (see Lidz 1998, 2001, 2003). The conclusions I reach concerning Igbo and Mandarin amplify this observation about Kannada.[13]

It is worth pausing to reflect on English, which I believe makes the same point, if less dramatically than do Igbo and Mandarin. Consider the verb strike out, in its baseball-related meaning.[14] It describes an event which cannot possibly be defined without reference to a sequence of pitches and swings, balls and bats, and so forth. Yet the verb clearly makes none of these participants into lexical arguments. Only the batter, and sometimes the pitcher, are ever identified by argument phrases. And whether even the pitcher and batter arguments instantiate lexical arguments of the

[12]What Lidz, Gleitman, and Gleitman (2003) actually say is that children presuppose that a verb will have as many *lexical arguments* as its event has participants. But they say this only because they presume that an argument phrase with which a verb must cooccur is ipso facto a lexical argument of the verb. This premise is not something for which they argue. They argue only for the broader conclusion I describe, namely that, as children see it, each participant in the event of a verb ought to be identified by an argument, i.e. nonadjunct phrase, in its clause.

[13]If Lidz, Gleitman, and Gleitman (2003) are right, there is a period of deep misunderstanding between child learners and adult speakers of Kannada. An adult uses basic clauses that do not identify every participant in their event. So an adult may describe an event of V'ing without mentioning its agent, even when he thinks that all V events have an agent. His child audience, presupposing that a basic clause identifies every necessary participant in its event, deduces that V events do not have agents. So until the child learners drop their presupposition (which Lidz, Gleitman, Gleitman take to be determined innately) they will fail to understand what the adults are talking about. If this is right, one wonders what leads the children to recognize their misunderstanding.

[14]I thank Jerry Sadock (p.c.) for this evocative example.

verb, furthermore, is still another question. They might be introduced syntactically.

The verb jimmy supplies another example. It describes an event of opening (or trying to open) something with a short crowbar, or any short lever used as such. There is no way to say what counts as an event of jimmying without mentioning a lever. Yet jimmy has no need to cooccur with a phrase that identifies the lever, and so has no lever-argument lexically.

(38) Al jimmied the car door.

One cannot say that the syntax of (38) does contain a lever argument, just one that happens to be silent. If it did, jimmy would have two complements internal to its VP. Double-complement verbs typically cannot occur in CCs, (39). But jimmy is normal in M, (40).

(39) a. * Al sprayed the litmus paper with acid pink.
Intended: 'Al made the litmus paper pink by spraying it with acid.'

b. * Al had previously driven that nail into concrete dull.
Intended: 'Al had previously made that nail dull by driving it into concrete.'

c. * Al taught Bill math smart.
Intended: 'Al made Bill smart by teaching him math.'

(40) Al jimmied the car door open.

Nor can one explain the absence of a lever-argument in (38) by saying that the lever-participant is 'semantically incorporated' into the verb meaning. This begs exactly the questions we are asking. Which of the participants that are 'incorporated' into the verb's meaning are necessarily realized by arguments? And which arguments instantiate lexical arguments of the verb? The lever and the thing jimmied are equally

necessary in any event of jimmying. But the fact is, only the thing jimmied must be identified by an argument.[15]

In desperation, one might respond to such observations by claiming there is a second level of 'semantics.' At semantics level 1, we see all the participants an event must have, if it's to count as an event of striking out or jimmying. But at semantics level 2, the newly proposed level, we see only those participants that wind up being identified by arguments in simple clauses with strike out or jimmy. This allows us say that every participant listed at level 2, which we are calling a level of 'semantics,' is identified by an argument in syntax. But what sort of achievement is this, when the only reason for positing level 2 is to make this statement? Anything else we need to say can be said with equal ease in a theory that recognizes only 'level 1,' i.e. semantics proper, along with the syntax and its accompanying lexicon.

Even before heading into the more persuasive data from Igbo and Mandarin, therefore, there is little reason to suppose that a verb has a lexical argument for each participant in its event. And consequently the idea that this should be true does not offer a compelling a priori argument against nonprojectionism. Indeed the idea itself derives from the *presupposition* of projectionism, as we will see in section 2.7 of chapter 2.

[15]Of course the behavior of jimmy also cannot be explained by the fact that English includes a noun jimmy, meaning 'a short crowbar.' Many speakers use the verb jimmy without knowing of the noun, and for these speakers the presence of the noun in a dictionary could not possibly matter to the grammar of the verb.

The example of jimmy can be recast using the verb pry. But here there is the distracting (though actually irrelevant) complication that pry can only occur in CCs, or with 'resultative particles,' (41).

(41) a. Al pried the car door *(wide open).

b. Al pried *(off) the lid.

1.3.3 What is a lexical argument of the verb?

A projectionist model, I have said, treats an argument as instantiating a lexical argument of the verb; and I have said that one way of representing a lexical argument is by having the verb denote a certain type of function. In this section I will expand on what I take this to mean.

A verb has a lexical argument when a requirement to cooccur with a certain type of expression is stated in its lexical representation, rather than in any other part of the grammar. A verb has a patient as a lexical argument, for example, when its lexical representation requires that it cooccur with an expression grammatically constrained to identify the patient of its event. Yet I will allow a moderated, conditional view of such 'requirements,' one that sorts the data into the *expected* and the *special* cases. This will grant broader generality to the conclusions I reach later.

The *expected* cases are derivations where the verb does indeed cooccur with the sort of argument it 'requires.' But there may also be *special* cases, where the verb does not cooccur with its 'required' argument.[16] These are special because they demand explanation. Specifically, we demand good evidence that the derivation involves a valence-reducing operation, one that eliminates the verb's requirement; or, to put it differently, one that satisfies the requirement otherwise than providing an argument expression of the right sort. Good evidence must be independent of the facts it is meant to explain. So the plain fact that a verb occurs without a certain argument is not good evidence for a valence-reducing operation. Ideally, the postulated operation will be correlated with some independent change in form or meaning; it might be linked to an overt affix signalling (anti-)passivization, for instance. Importantly, if

[16]I describe this as a moderated view. The unmoderated view is present in the "Projection Principle" (Chomsky 1981). As conventionally understood, this principle says that I what I call the expected case is actually the only possible case. A verb with a lexical requirement for a (e.g.) a patient *always* coocccurs with an argument identifying the patient.

no good evidence can be found, this counts strongly against the original hypothesis that forced the demand for it, namely the hypothesis that the verb has a lexical requirement for a certain argument.

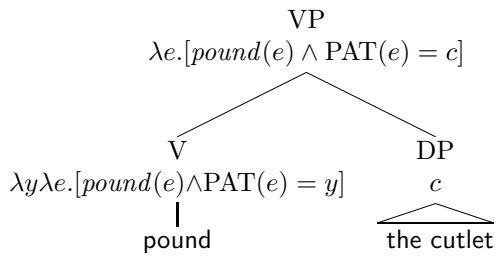
When a verb does not have a patient (agent, etc.) as a lexical argument, the lexical representation of the verb does not itself require that the verb cooccur with a phrase that identifies the patient (etc.) of its event. The distribution of the verb with respect to patients (etc.) is determined by other components of the grammar: rules of phrase structure, rules of semantic composition, or the properties of other morphemes in the language. By itself, therefore, the lexical representation yields no expectation about the verb's distribution. And so if it occurs without a patient, this is not ipso facto a 'special' case.

In this work I use the semantic type of a verb as a convenient way of representing its argument requirements. Specifically I assume that a verb has a patient as a lexical argument if and only if it denotes a function over a patient; the same goes for any other thematic participants, such as agents. Thus if I assign pound a denotation like (42), I am saying that, in the expected case, and perhaps always, pound cooccurs with a phrase constrained to identify the patient of pounding.

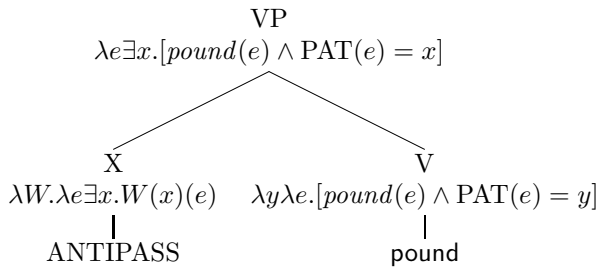
(42) $\quad [\![\textsf{pound}]\!] = \ldots \lambda y \ldots [\ \mathit{pound}(e) \ \wedge \ \mathrm{PAT}(e) = y \ldots\ ]$

If it does not, then this counts as a special case, demanding explanation. We will want evidence for an operation that reduces pound's valence, binding or eliminating the y variable in its denotation. Thus (43) would count as an instance of the expected case, and (44), as one sort of special case.

(43)



(44)



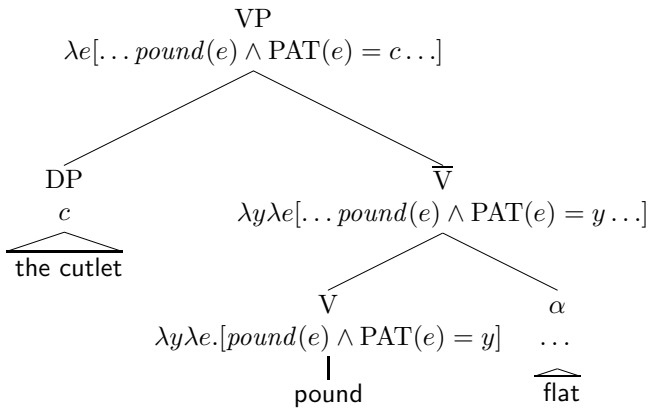
This use of semantic type should not be too distressing, since it agrees with a common practice. But of course this practice does not follow logically from what it means to be a function. It reflects a network of assumptions about just what sorts of rules for semantic and syntactic composition operate in the verb phrase in particular. Absent such assumptions, a function is under no obligation to combine with anything. And given a different network of assumptions, the obligations incurred would be different. But our topic is whether a verb has a lexical requirement for an argument, and not what assumptions allow the semantic type of a verb to represent such requirements; so I will not spend time describing those assumptions here. For an account of one framework which links having a lexical argument to denoting a function, see Heim and Kratzer 1998.

One feature of this convention that must be stressed, however, is its restriction to *verbs* (i.e. things that head verb phrases, or if you like, roots local to v). Common nouns are conventionally assigned the type $\langle e, t \rangle$. Yet here the expectation is that the noun will combine with a determiner of type $\langle \langle e, t \rangle, \ldots \rangle$, and not a noun phrase of type $\langle e \rangle$. Similarly, if I assign the adjective flat the denotation $\lambda y \lambda e.[\textit{flat}(e) \wedge \text{PAT}(e) = y]$,

it does not mean that flat has a lexical requirement to cooccur with an expression in type $\langle e \rangle$ identifying what is flat. Evidently flat has no such requirement, since it does not combine with any $\langle e \rangle$-type expression in, e.g., the very flat cutlet.

Two last clarifications are necessary. I do not assume that the satisfier of the verb's requirement must be found immediately in its sister. Within certain narrow limits, non-immediate instantiation of arguments is permitted.[17] The verb may occur in contexts which have the effect of 'passing along' its requirements to a containing constituent. Relevant here is the possibility of a derivation like (46). Here a complex predicate, pound flat, inherits from pound a requirement to cooccur with a phrase identifying the patient of pounding, represented by the λy in the denotation of $\overline{\text{V}}$. Thus (46) still counts as an expected case, given a representation like (42) for pound.

(46)



Nor do I assume that the satisfier of the verb's requirement can satisfy only that one requirement, and no others. A single phrase might satisfy the requirements of more than one predicate. So in (46), where the cutlet satisfies a requirement of pound (for an argument identifying what is pounded), it might also satisfy a requirement of

[17] Constraints on non-immediate instantiation of arguments will of course recapitulate the constraints on A-movement, like those that account for (45). Whether they need to be still stricter is not clear.

(45) * The lake seems that it is likely to freeze solid.

flat (for an argument identifying what is flat), if flat has such a requirement. More generally, I do not accept that part of Chomsky's "Theta Criterion" (Chomsky 1981) which says that a phrase can be assigned no more than one θ-role. Arguments can be shared, and correspondingly, the grammar can constrain the thematic interpretation of an argument phrase with respect to more than one predicate. Certainly, this is the case (46): the cutlet is constrained to name both what is pounded, and what is flat.

1.4 The relevance of CCs

CCs are often analyzed as *complex predicates*. It is assumed, that is, that M contains no argument positions. Instead the means verb combines directly with R to the exclusion of the object, (47); for English see e.g Chomsky 1957, Dowty 1979, Baker 1989, Jackendoff 1990, Larson 1991, Hale and Keyser 1993.

(47) [OBJECT [V_{means} R]] (linear order irrelevant)

Insofar as this analysis is correct for a given CC, the construction will provide a diagnostic environment. By putting a verb in M, we stand to learn something about its lexical argument structure.[18] Let us see why.

Suppose we are choosing between two denotations for pound, (48) and (49). The two options make different predictions when pound occurs in M, if the CC is a complex predicate.

(48) $[\![\text{pound}]\!] = \lambda y \lambda e.[pound(e) \ \wedge \ \text{PAT}(e) = y]$

(49) $[\![\text{pound}]\!] = \lambda e.pound(e)$

[18] Some of the points I make about the complex predicate analysis can also be made about the Small Clause analysis (Kayne 1985, Hoekstra 1988), according to which CCs have the structure: [V_{means} [OBJECT R]]. Yet I will not entertain such analyses in this dissertation, for reasons I describe in section 1.6 below (cf. Sybesma 1999).

Given (48), the verb, when it occurs in M, will have an argument that is not immediately saturated, since there the verb's sister will be R, an expression that cannot provide a patient. We consequently expect that the complex predicate will *inherit* this unsaturated argument from M. We expect, for example, that the denotation of pound flat will have the outlines in (50).

(50) $[\![\text{ pound flat }]\!] = \lambda y \ldots pound(e) \wedge \text{PAT}(e) = y \ldots$

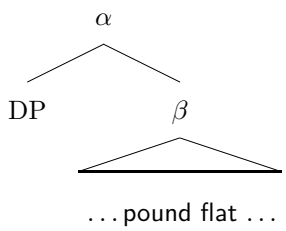
So by assigning the argument to the verb lexically, we encode an expectation that the verb will be subject to the same requirement in a CC as in a simple clause. In both contexts it will cooccur with a phrase understood as its patient. Any deviations from this expectation will count as special cases, in need of explanation. For example, we might need to posit a covert operator that binds the verb's unsaturated argument.

We have no such expectation, however, if the patient is not an argument of the verb, (49). Then there will be no argument left unsaturated when M and R combine, and no argument to pass along to the complex predicate. So there will be no assumption, based solely on the verb's lexical representation, that it will enter the same thematic relation in CCs as it does in simple clauses. It will not come as a surprise if no noun phrase in an CC is interpreted as the patient of the means event.

Related to this, the two models make different predictions about what interpretations are even *possible* for a noun phrase outside the complex predicate, whether the object or the subject.

As we just saw, if pound has its patient as a lexical argument, (48), then larger predicates containing pound can inherit this argument. Consequently there is no problem assigning the patient-of-pounding relation to a DP that occurs at a remove from the verb, outside its c-command domain, like in (51). Node β might have a denotation like (50), having inherited the patient argument of pound.

(51)



There will be a problem, however, if pound does not have the patient as a lexical argument, (48). Then a patient relation could only be introduced structurally. But if the patient relation is introduced outside the complex predicate, between a DP and a constituent that contains both M and R, it will relate the DP-referent to the event of the entire complex predicate, not to the M event in particular. Look again at (51). If a patient relation is introduced between DP and β, it will constrain DP to identify the patient of causation, but not the patient of pounding. (The same would be true, mutatis mutandis, if DP were instead assigned an agent relation to β.)

Any thematic relation to pound in particular would have to be introduced by structure immediately local to the verb, within a constituent that includes M but excludes R, and makes no mention of the event of causation. Yet it is typically assumed that structure which introduces thematic relations coincides with the presence of an argument DP.[19] And what the complex predicate analysis says is exactly that the means verb does *not* combine with an argument DP before joining the CC predicate.

Other things being equal,[20] therefore, we do not expect that a noun phrase generated outside the CC predicate even *can* be assigned a patient (or agent) relation to the means event, unless the verb in M has a patient (or agent) as a lexical argument.

[19]For example, Kratzer proposes a head v_{AG} that introduces an agent relation; it also requires the agent DP to occur in the specifier of its vP. And semantic rules for introducing a thematic relation, like my (30b), are typically rules that interpret a node whose daughters are an event predicate *and* the DP to which the thematic relation is assigned. Any theory which voids this assumption will lose much of its predictive power.

[20]Among the other things that must be kept equal is the assumption I describe in section 1.6 below: the causative meaning of the construction does not project from the lexical representation of the means verb itself (*pace* Simpson 1983 and others).

If they are complex predicates, therefore, CCs can provide evidence for whether or not a given thematic relation projects from the verb. If the relation obtains wherever the verb occurs, equally in CCs and simple clauses, then it is likely introduced by the verb itself, lexically. But if it should matter where the verb occurs—with the relation required in simple clauses, but not in CCs—then it is more plausibly introduced, not by the verb, but by its context. Putting it differently, if the subject or object in a CC is grammatically constrained to bear a certain thematic relation to means event, this is evidence that the relation projects from the verb in M. And to the extent that their interpretation with respect to M is unconstrained, it is evidence that the verb has no arguments lexically.

I will decide in section 1.6 that CCs are complex predicates in all the languages under consideration. The motives for this decision are especially strong in Igbo and Mandarin, and so in these languages, the conditions under which CCs are relevant to our theoretical question are very clearly met.

Finally it is worth stressing an important presumption of the complex predicate analysis. It presumes that a verb is under no obligation to occur in exactly the same local environment, always. A verb may sometimes find a noun phrase in its sister, for example, and sometimes a result predicate. There are grammatical frameworks which forbid this possibility entirely, and presume that any verb always occurs in exactly the same local environment. This is the basic picture in many early versions of Transformational Grammar, and in versions of Government and Binding Theory that incorporate both the Theta Criterion and the Projection Principle (Chomsky 1981): at deep structure, a verb always occurs in the same sort of VP. If all the data are *presupposed* to reflect these assumptions, there can be no serious question of choosing between projectionist and nonprojectionist models of it. The difference could not possibly matter to our expectations of where the verb can or cannot occur—since

it always occurs in the same place by hypothesis. And in this situation, a projectionist analysis is naturally favored, simply because it allows the convenience of recording all relevant facts about the distribution of the verb in one place, its lexical representation.

1.5 Outlines of the semantic derivation

This section introduces the semantic representations I rely on later, in particular my representation of thematic relations and causation.

I presuppose some familiarity with event-based representations (see e.g. Davidson 1967, Castañeda 1967, Higginbotham 1985, Parsons 1990, Landman 2000, Rothstein 2004, Pietroski 2004). These posit a domain of *events*, $\langle v \rangle$, in addition to the usual domain of individuals, $\langle e \rangle$. Clauses are typically construed as descriptions of an event, with denotations like (52). Any variable $e_{(\alpha)}$, ranges over $\langle v \rangle$; variables x, y, and z range over $\langle e \rangle$.

(52) $\quad [\![\text{ S }]\!] = \ldots \exists e. \ldots \phi(e) \ldots$

I take verbs to denote (the characteristic function of) a set of events, in type $\langle v, t \rangle$, or a function from one or more individuals to a set of events, in type $\langle e, \ldots \langle v, t \rangle \rangle$, (53).

(53) $\quad [\![\text{ V }]\!] = \{\lambda x \ldots\} \lambda e. \psi(e, \{x, \ldots\})$

In the latter case, represented by including what (53) puts in curly braces, the individuals are assigned thematic relations to the event. For me it will be useful to assume that thematic relations can be factored apart from the rest of a verb's meaning (see section 1.5.1), and thus can be expressed as in (54), by conjoining the proposition that individual x bears thematic relation θ to event e.

(54) $\quad [\![\text{ V }]\!] = \lambda x \ldots \lambda e. P(e) \ \wedge \ \theta(e) = x \ldots$

At some point in the derivation, all event variables are existentially bound. This happens either by default, or because the event-predicate occurs in the scope of some operator which imposes binding (such as negation or a modal operator).

1.5.1 Introducing the agent and patient relations

A nonprojectionist theory is one that introduces argument relations syntactically. I will follow a common assumption about what this means. Introducing an argument syntactically entails that something in the syntactic context of the verb, and not the verb itself, introduces a thematic predicate into the semantic derivation. Take (55), for example, which repeats (30b). This rule associates the introduction of a patient argument with VP structure, and part of this is introducing the actual content of the argument's thematic relation to the V event, in the thematic predicate PAT.

(55) $\llbracket\ [_{\mathrm{VP}}\ \mathrm{V}\ \mathrm{DP}\ ]\ \rrbracket = \lambda e.[\llbracket \mathrm{V} \rrbracket(e)\ \wedge\ \mathrm{PAT}(e) = \llbracket \mathrm{DP} \rrbracket]$

This is not the only possibility. For Rothstein (2001, 2004), syntactic introduction of an argument does not mean introducing a thematic relation. It just means abstracting over a designated variable in a structured denotation. The content of the thematic relation is expressed by restrictions on that variable stated in the denotation of the *verb*. Applied to the example at hand, this view would replace (55) with a rule like (56), and pound would denote something like (57), with the superscripted circle distinguishing x as the variable to be abstracted over at VP. The semantic representation of pound the cutlet would then be derived as in (58).

(56) $\llbracket\ [_{\mathrm{VP}}\ \mathrm{V}\ \mathrm{DP}\ ]\ \rrbracket = \lambda x^{\circ}\llbracket \mathrm{V} \rrbracket(\llbracket \mathrm{DP} \rrbracket)$

(57) $\llbracket\ \textsf{pound}\ \rrbracket = \lambda e.[\ \mathit{pound}(e)\ \wedge\ \mathrm{PAT}(e) = x^{\circ} \ldots\ ]$

(58) $[\![[_{\mathrm{VP}}$ pound the cutlet $]]\!]$

a. $= \lambda x^{\circ}[\![\textsf{pound}]\!]([\![\textsf{the cutlet}]\!])$

b. $= \lambda x^{\circ}\lambda e.[\ \mathit{pound}(e)\ \wedge\ \mathrm{PAT}(e) = x^{\circ}\ldots\ ](c)$

c. $= \lambda e.[\ \mathit{pound}(e)\ \wedge\ \mathrm{PAT}(e) = c\ldots\ ]$

This approach has some interesting grammatical applications,[21] but I will not adopt it. I prefer to maintain the fundamental association between syntactic and semantic relations embodied in the more common approach, whereby introducing arguments means introducing thematic relations.

Because of this, it is necessary that there *be* thematic relations, separable from the (remaining) meaning of the verb. I make significant use of two thematic predicates, AG and PAT, which denote what I will call the agent and patient relations. My patient relation is perhaps more often called the "theme" relation.

I intend both relations to be understood very broadly, and to do little more than distinguish an active 'initiator' of an event from a passive 'undergoer.' More specific information about the agent or the patient of an event—whether the agent is volitional, for example, or whether the patient undergoes a change of state—derives from sources other than the content of the thematic relation, such as (i) what sort of the thing the agent or patient is, and (ii) what sort of event it is related to. My agent and patient relations are thus similar to the "Actor" and "Undergoer" relations in Foley and Van Valin 1984, or Van Valin and Wilkins 1996.

The subjects of (59a) and (59b), for example, are not assigned distinct thematic relations. Both identify agents. But Al is more likely to be sentient than the meteor,

[21] Rothstein's method of introducing arguments syntactically is designed to allow for the syntactic introduction of subject arguments, in a way that does not discriminate between expletive subjects and those associated with semantic content. If all subjects are introduced syntactically, and some subjects are expletive, then of course the syntactic introduction of arguments cannot always be associated with the introduction of thematic relations.

so he is more likely to have initiated the striking volitionally.

(59) a. The meteor struck Bill.

b. Al struck Bill.

Nor are the objects of (60a) and (60b) assigned distinct thematic relations. Both identify patients. But events described as splittings involve a definite change in the material integrity of their patients, while those described as strikings do not. So we know that a patient of splitting is affected in a way that a patient of striking is not.

(60) a. Al struck the plank.

b. Al split the plank.

For further development of this perspective, see (e.g.) Parsons 1990, Van Valin and Wilkins 1996, Landman 2000, and Pietroski 2004.

I will also presume that, at least for nonrelational states (or 'qualities') like the state of being flat or the state of being dead, the holder of the state is its patient. Thus I presume representations like in (61). If this seems odd, it may help to replace my term *patient* with *theme*, which has more often been used to describe the holder of a state.

(61) $[\![\ \textsf{The cutlet is flat}\ ]\!] = \exists e.[\ \mathit{flat}(e)\ \wedge\ \mathrm{PAT}(e) = \mathit{cutlet}\ ]$

This seems especially natural in languages, like Igbo, where there is no regular formal expression of a distinction between stative and state-change meanings. Igbo (62) serves to translate both of the given English glosses. In English, the semantic distinction is matched by the paradigmatic difference between a verb and a predicate adjective. In Igbo there is no similar distinction.

(62) Ọba ahụ wa -ra awa.
gourd that split -FACT BVC
Translates either as 'the gourd split' or as 'the gourd is split.'

It seems attractive to assume that the gourd has the same thematic relation regardless of whether (62) is understood as stative or eventive.

As I have said, there must be thematic predicates if arguments are introduced syntactically, given my assumptions. To demonstrate that an argument is introduced syntactically is therefore to demonstrate the existence of a certain thematic predicate. And this is the sort of argument I'll give in chapter 2.

At the same time, there are doubts about the semantic viability of very general thematic predicates, like AG and PAT. Best known are those in Dowty 1991, which argues that 'agents' and 'patients' of different event-types have too little in common for predicates like AG and PAT to be assigned proper truth conditions, definable independently of any particular verb-meaning. Dowty grants only this: given a verb describing an event with two participants, we can decide which participant is *more likely* to be identified by the subject (or by the object), in light of which *better* fits the description of a *prototypical* agent (or patient, respectively). Unlike Dowty, Kratzer (1996, 2003) believes that a general agent predicate can be defined. But she agrees that a general patient predicate cannot be (Kratzer 2003), persuasively elaborating the observation that the putative patients of diverse verbs have little in common. We cannot recognize the patient of an event, therefore, without knowing what description of that event is imposed by the verb.

The use of predicates like AG and PAT will thus require that events—that is, the things to which the AG and PAT functions apply—are individuated to a very fine grain. It must be that any event can be truly described by relatively few verbs. Then information particular to the verb can be recast in the structure of the event itself,

and each event will, so to speak, wear its agent and/or its patient on its sleeve (see Parsons 1990, Landman 2000, Pietroski 2004). So we will know that a buyer is not seller, for example, because an event described by buy is never truly described by sell, even though, necessarily, a buying occurs whenever a selling does. The arguments of Dowty and Kratzer are essentially an objection to this result. The requisite degree of finegrainedness tends to undermine one motivating ambition in semantic theory, that of relating language to a denotational domain of significantly independent structure. Semantics is supposed to relate language to the world, the idea goes, but the world is independent of verbs, and so fine-grained events are not objects in the world.

I will not engage the semantic issue directly. Rather I will let my distributional argument for a nonprojectionist analysis of Mandarin and Igbo speak for itself. If it is correct, both agents and patients are introduced syntactically in these languages. And if I am right to assume that introducing arguments syntactically means introducing thematic predicates, then there must be predicates like AG and PAT.

1.5.2 Introducing the *CAUSE* relation

CCs say that the M event causes the R event. I will formalize this observation by presuming that CCs describe an event of causation, an event e such that $CAUSE(e, e_m, e_r)$, where e_m is the means event and e_r the result event. Correspondingly I presume that the smallest constituent κ that contains both M and R denotes along the lines of (63), where $\mathcal{M}$ and $\mathcal{R}$ are variables over the event sortals contributed by M and R. Further content may fill in the ellipses in (63), if that should be necessary.

(63) $\quad [\![\ [_\kappa\ \mathrm{M} \ldots \mathrm{R}\ ]\ ]\!] = \ldots \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge \mathcal{M}(e_1) \wedge \mathcal{R}(e_2) \ldots]$

My interest is not in defining what conditions hold when three eventualities stand in the *CAUSE* relation; that is, in giving an analysis of causation. I will just assume

that *CAUSE* stands in for whichever analysis turns out to be correct. If Rothstein's mereological analysis of causation is correct, for instance, then $CAUSE(e, e_m, e_r)$ would be equivalent to the proposition in (64); here CUL maps an event onto its "culmination" (see Parsons 1990 and Landman 2000).

(64) $(e = e_m \sqcup e_r) \wedge (\text{CUL}(e_m) \sqsubseteq e_r)$ (Rothstein 2001: 158)

Many accounts of English CCs posit a cause-relation which requires that both the means and the result eventualities are dynamic events, and not states. My *CAUSE* is indifferent to this distinction. This permits a simpler semantic description of languages, Mandarin and Igbo included, where R may describe eventualities of either sort. In (65a), for example, R is stative but in (65b) it is eventive. If either sort of eventuality can be the result eventuality in a *CAUSE* relation, then all CCs can be assigned the same semantic structure; there will no need posit a covert operator, just when R is stative, that maps its state to the event of its inchoation, for example.

(65) a. Lǎo Wèi zá píng -le nà kuài ròu.
L.W. pound flat -PFV that chunk meat
'Lao Wei made that piece of meat flat by pounding.'

b. tā tī duàn -le nàtiáo mùbǎn.
3s kick snap -PFV that plank
'S/he made that plank snap by kicking.'

In Mandarin, even M may be stative, (160), suggesting that there is no universal restriction on the event-type of the means eventuality either. In Mandarin cases like these, furthermore, there is no obvious means *event* to which one could convert the state given by the M verb; certainly (160) mentions no event of the tofu *becoming* spicy.

(66) nà wǎn māpodòufu là kū -le xiǎo haízi.
that bowl Mapo Tofu spicy cry -PFV small child
'That bowl of Mapo Tofu made the child cry by being spicy.'

Because the distinction between states and events will play no role in my discussion, I will generally avoid the cumbersome term *eventuality*, and use *event* as a hypernym for both states and events proper.

I will presume that (at least) the *CAUSE* relation is introduced by a silent morpheme, CAUSE. Given (63), I take it that CAUSE denotes within the limits of (67).

(67) $[\![\text{CAUSE}]\!] = \lambda R \lambda M \ldots \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge M(e_1) \wedge R(e_2) \ldots]$

If M and R both have lexical arguments, it may be that those arguments are unified (i.e. identified, or associated with the same variable[22]) resulting in argument sharing. When necessary, this could be accomplished by building abstraction over these arguments into the denotation of CAUSE. (68) unifies a single presumed internal argument of the two predicates.

(68) $[\![\text{CAUSE}]\!] = \lambda R \lambda M \lambda x \ldots \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \ \wedge \ M(x)(e_1) \ \wedge \ R(x)(e_2) \ldots]$

The alternative is to leave CAUSE simple, (67), and accomplish unification of arguments in the rules of semantic composition. (70–73) is one set of rules that would be sufficient. Using these would allow some generality. The denotation of CAUSE would be kept the same, regardless of what valence M and R have; and the rules themselves would have formal analogues in other rules of conjunction.[23] But of course it would also put a greater burden on the syntax, to ensure that argument categories appear

[22] What I call "unification" of arguments is more often called "identification" of arguments. But avoiding the latter term will avert possible confusion, since I typically say that an argument NP "identifies the agent" or "identifies the patient" of an event.

where we want them to, within some local domain.

(70) a. If $[\![\text{A}]\!]$ is in type $\langle\alpha,\ldots\rangle$ and $[\![\text{B}]\!]$ is in type $\langle e,\alpha\rangle$, then:
$[\![[\ \text{A B}\ ]]\!] = [\![[\ \text{B A}\ ]]\!] = [\![\text{A}]\!] \circ [\![\text{B}]\!]$.

b. $A \circ B = \lambda y.[A(B(y))]$
Simple Function Composition

(71) a. If $[\![\text{A}]\!]$ is in type $\langle e,\langle\alpha,\ldots\rangle\rangle$ and $[\![\text{B}]\!]$ is in type $\langle e,\alpha\rangle$, then:
$[\![[\ \text{A B}\ ]]\!] = [\![[\ \text{B A}\ ]]\!] = [\![\text{A}]\!] \overset{+}{\circ} [\![\text{B}]\!]$.

b. $A \overset{+}{\circ} B = \lambda y.[A(y)(B(y))]$
Function Composition, with one pair of arguments unified[24]

(72) a. If $[\![\text{A}]\!]$ is in type $\langle e,\langle\alpha,\ldots\rangle\rangle$ and $[\![\text{B}]\!]$ is in type $\langle e,\langle e,\alpha\rangle\rangle$, then:
$[\![[\ \text{A B}\ ]]\!] = [\![[\ \text{B A}\ ]]\!] = [\![\text{A}]\!] \overset{+}{\circledcirc} [\![\text{B}]\!]$

b. $A \overset{+}{\circledcirc} B = \lambda y\lambda x.[A(y)(B(y)(x))]$
Double Function Composition, with one pair of arguments unified

(73) a. If both $[\![\text{A}]\!]$ and $[\![\text{B}]\!]$ are in type $\langle e,\langle v,\ldots\rangle\rangle$, then:
$[\![[\ \text{A B}\ ]]\!] = [\![[\ \text{B A}\ ]]\!] = [\![\text{A}]\!] \overset{+_v}{+_e} [\![\text{B}]\!]$

b. $A \overset{+_v}{+_e} B = \lambda x\lambda e[A(x)(e) \wedge B(x)(e)]$
Conjunction, for predicates in $\langle e,\langle v,\ldots\rangle\rangle$

I will generally build argument unification into CAUSE. Mainly this is meant to keep exposition clear and compact. Occasionally I will show the alternative implementation, using rules from (70–73).

[23]These attractions could be pursued still further by factoring even the M and R arguments out of CAUSE, (69), and adding these instead by generalized rules of predicate conjunction. This follows the perspective developed in Pietroski 2004.

(69) $[\![\ \textsc{cause}\ ]\!] = \lambda e\exists e_1\exists e_2.CAUSE(e,e_1,e_2)$

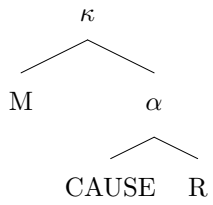
[24]This operation is referred to as "Substitution" in Steedman 1997.

There are some syntactic reasons to assume a CAUSE head. But I have no very strong objection to an analysis where *CAUSE* is instead introduced by the semantic rule which combines M and R, along the approximate lines of (74). Argument sharing can be built in by including the material in curly braces, which puts this rule in the genre of (71) or (72). Analyses of this type are found, among other places, in Larson 1991, Hale and Keyser 1993, and (more explicitly) in Rothstein 2001 (pg. 158).

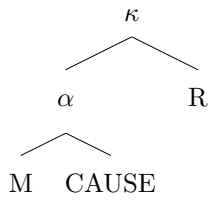
(74) $[\![\text{ M R }]\!] = \{\lambda x \ldots\}\lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \ \wedge \ [\![\text{M}]\!]\{(x, \ldots)\}(e_1) \ \wedge \ [\![\text{R}]\!]\{(x, \ldots)\}(e_2) \ \ldots \ ]$

If there is a CAUSE head, of course, it must be c-commanded by both M and R, as in either (75) or (76); otherwise it could not compositionally introduce a relation between their meanings.

(75)



(76)



I will take (75) to be the correct structure, as cross-linguistic patterns in the word order of CCs suggest to me that M is the less embedded predicate; see chapter 4. But compare Embick 2004, who makes use of a structure like (76). Some assumptions about the syntactic category for κ will surface in chapters 2 and 4.

1.5.3 On the combinations of M and R

Not all combinations of means and result predicates are equally acceptable, even when all syntactic constraints are satisfied. (77) is fine, for example, but (78) is not.

(77) "Graner [. . .] punched the detainee unconscious."
(K. Zernike, *New York Times*, 14 May 2004)

(78) # Graner punched the detainee angry.

The apparent unacceptability of a given combination might have any of several causes. It might violate some semantic principle, or clash with our understanding of the world, or just seem odd by virtue of its novelty. Surely each of these factors accounts for some of the data. Determining which factors explain which facts, and then developing a general theory in each area of what makes an acceptable combination, is an important topic in the analysis of complex causatives (see for example Green 1972, Dowty 1979, Rappaport Hovav and Levin 2001, Wechsler 2001, Boas 2003).

It is not a topic I will pursue in this work, however. In part this decision is meant to limit the scope of the study. But it has a further motivation in the difficulty of the facts, viewed from a comparative perspective.

Quite often a combination that is natural in one language is considered unacceptable when translated into another. Take Mandarin (79), for example. (80) is an approximate translation which, so far as I know, obeys all the syntactic constraints on CCs in English. But (80) is terrible.

(79) tā liǎng bǎ wǒmén dōu chǎo fán -le.
3s two BA 1p all quarrel annoyed -LE
'Those two made us all annoyed by quarreling.' (Wang 1995: 148, tr. AW)

(80) # Those two quarreled us all angry.

Contrasts like this show the difficulty of drawing conclusions, based on one language, about what combinations are licit on semantic grounds: as far as possible, constraints that are purely semantic should apply universally. Consider Mandarin (81). Again its English equivalent is quite bad, (82), though it is flawless syntactically.

(81) zhè yīfú nǐ yòu xǐ zāng -le.
these clothes you again wash dirty -le
'Again you made these clothes dirty by washing.'
(Yuan 2001: 400, tr. AW)

(82) ?# Again you washed the clothes dirty.

The unacceptability of sentences like (82) has been taken to show that R must describe a normal or expected result of the M action (see Wechsler 1997, Boas 2003). Maybe there is something to this conclusion, but in light of the Mandarin data it is not deeply gratifying, since there it does not apply. Similar comments apply to the contrast between Igbo (83) and English (84).

(83) Obi gba rụ -rụ miri.
Obi move go bad -FACT water
'Obi made the water dirty by stirring.'

(84) ?# Al stirred the water bad/dirty.

Because of such frustrations, I will have nothing to say about what combinations of means and result predicates are possible. My interest is in highlighting those aspects of complex causative structure which, at least to me, appear clearly to be uniform across languages.

1.6 Outlines of the syntactic analysis

1.6.1 CCs are built in syntax

I will assume that, except perhaps in sporadic special cases, CCs are built in the syntax, out of productively available parts. As I mean it, this assumption has two aspects that are relevant here. First, the verb head in M does not itself introduce the relation of causation between events, and neither does the head in R; as just discussed, this relation is introduced by some part of their structural context. Second, the verb head in M can also occur outside of M, as the main predicate of a simple clause.

(85) sketches a possible analysis of pound flat that is compatible with these premises, and (86), one that is not. The two analyses assign the same denotation to the the complex predicate; (85a) and (86a) are identical. But (85) introduces the relation between M and R events contextually, while (86) introduces it in the lexical representation of the means verb.

(85) a. $[\![\text{ pound flat }]\!] = \lambda x \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \ \wedge \ pound(e_1) \ \wedge \ \text{PAT}(e_1) = x \ \wedge \ flat(e_2) \ \wedge \ \text{PAT}(e_2) = x \ ]$

b. $[\![\text{ pound }]\!] = \lambda y \lambda e . [\ pound(e) \ \wedge \ \text{PAT}(e) = y \ ]$

c. $[\![\text{ flat }]\!] = \lambda z \lambda e . [\ flat(e) \ \wedge \ \text{PAT}(e) = z \ ]$

(86) a. $[\![\text{ pound flat }]\!] = \lambda x \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \ \wedge \ pound(e_1) \ \wedge \ \text{PAT}(e_1) = x \ \wedge \ flat(e_2) \ \wedge \ \text{PAT}(e_2) = x \ ]$

b. $[\![\text{ pound }]\!] = \lambda R \lambda x \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \ \wedge \ pound(e_1) \ \wedge \ \text{PAT}(e_1) = x \ \wedge \ R(x)(e_2) \ ]$

c. $[\![\text{ flat }]\!] = \lambda z \lambda e . [\ flat(e) \ \wedge \ \text{PAT}(e) = z \ ]$

Since (86b) makes R a lexical argument of pound, the verb in pound flat is not the same one that occurs in the simple clause (87) with the same pronunciation. The

latter verb occurs without any phrase identifying a result of pounding in the cutlet, and without any implication that there is such a result. So one cannot say that (87) involves the pound of (86b), but with existential binding of its R argument.

(87) Al pounded the cutlet.

Under the first analysis, however, there is no problem with assuming that (87) involves the same verb as what occurs in pound flat, namely the verb described in (85b).

In excluding analyses like (86), let us call them *lexicalist* theories of CC structure, my main purpose is to sharpen discussion, by limiting the class of theories that need to be considered. I am not suggesting that they are incoherent. Reasonable analyses of this type have been presented in Simpson 1983, Wunderlich 1997, Wechsler 1997, and elsewhere.

Yet I admit to seeing little motivation for the lexicalist theories. Such theories posit that causative meaning is added in the lexicon, by an operation that relates one lexical item to another. Because this operation relates two lexical items, it could in principle relate two items with distinct pronunciations. In particular, the output of the operation, i.e. the item that occurs CCs, could have a form that is encountered nowhere except in CCs. From hammer, for instance, meaning 'to hammer,' it could produce shammer, meaning 'to make R by hammering,' with the latter verb form found only in the context of M. Yet this does not happen in English or, so it appears to me, in any language. More generally, I know of no language where the verb in M shows *any* morphological sign of causativization,[25] and no language where the predicate in R shows any morphological sign of derivation particular to the CC construction.[26]

[25]In some Oceanic languages, including Paamese (Crowley 1987: 64), some verbs do not have the same morphology when in M as they do in simple clauses. And what these cases show is *not* that the verb is causativized; almost the opposite. Verbs which take an object-marking suffix when they head a simple clause appear without that suffix when in M. The suffix instead attaches to the entire complex predicate, MR. This is what we expect if the suffix just reflects being immediately local to the structure that introduces the object.

[26]In many languages, the predicate in R may be a change of state verb. In some of these, there is

The actual situation is that roots which occur in M and R have the same overt form as predicates that occur elsewhere in the language, in simple clauses. And this is as any syntactic theory of CC structure predicts.

One fact occasionally offered in favor of a lexicalist analysis is that, *sometimes*, there are idiosyncratic restrictions on what words can occur in M or in R, and in what combinations (see Boas 2003). The idea is, such restrictions can only be stated over single, word-sized objects in the lexicon, and hence there must a single word-sized object in the lexicon that contains both a particular verb root and its relation to a result predicate. But even if one accepts this idea, which I do not (see Marantz 1997), the existence of idiosyncratic restrictions could only show that CC structure is *sometimes* built in the lexicon; that is, the lexicon contains *some* verbs that project CC structure. One would be free to assume that these are special cases, and that normally, CCs are built in syntax. As I see it, there is more regularity in the structure and interpretation of CCs than idiosyncrasy; so even a lexicalist ought to countenance that CCs are generally built in syntax.

In sum, I assume that the verb in M is the same verb we see in simple clauses, and thus that the semantic structure of a CC does not project from its means verb.[27]

a further requirement: when the CC is transitive, the root in R be one that, on its own, pronounces a transitive and agentive change of state verb (see Nishiyama 1998, Hyslop 2001, Collins 2002). In the Khmer (88), for example, R is the verb sɑmʔaat 'to clean,' which is derived from the stative sʔaat by infixing -ɑm-, a morpheme that signals the "transitive-causative voice" (Gorgoniyev 1966).

(88) koun baoh sɑmʔaat pʰteah.
child sweep clean.CAUSE house
'The child sweeps the house clean.' (ex. & tr. Schiller 1990)

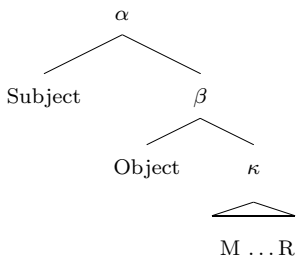
But the so-called causative form in R, whether transitive or intransitive, is never particular to the CC construction. It always occurs on its own in simple clauses as well. It is far from obvious, moreover, that the meanings of these verbs include *CAUSE* relation that relates M to R in the CC. I don't think the English verb clean means 'to make clean *by doing M*,' and I don't think the Khmer verb sɑmʔaat 'clean' does either (*pace* Dowty 1979 and Parsons 1990: 118, 139). There is therefore no compelling reason to suppose, based just on the fact that R is 'causative' verb, that it projects the *CAUSE* relation between M and R in (88).

[27]My anti-Lexicalist stance may seem surprising, given the context in which the comparison of Mandarin and Igbo was first established. Thompson 1973 argued against deriving Mandarin CCs

1.6.2 On the position of the object

(89) sketches the barest outline of the structure I presume for any (transitive[28]) CC, linear relations here being irrelevant. Again, κ is first node that dominates both M and R.

(89)



The direct object is outside the minimal node that contains both M and R, and so asymmetrically c-commands both. This assumption has two sorts of justification, semantic and syntactic.

In English, among other languages, the grammar sometimes constrains the thematic interpretation of the direct object with respect to *both* M and R. In (90), for example, Bill's chest is constrained to identify both the thing that is cut and the thing that winds up open. In such cases we say that the object is *shared*.

(90) Al cut Bill's chest open.

This interpretation of the object is not the result of common sense inference. It is imposed absolutely by the grammar of English, which (simplifying somewhat for

from two clauses, and for deriving them from two verbs. Lord 1975 responded with similar points for Igbo, noting its similarities to Mandarin. In the climate of the time, these arguments were presented as evidence for "lexical rules," and so for the emerging theory of "Lexicalism." In this dissertation, I presume that CCs are not built "in the Lexicon," and reject what later became a principle of "Lexicalism," viz. projectionism. But my proposals do not conflict (very much) with what Thompson and Lord actually say. I just don't assume that, if two verbs combine, they must do so "in the Lexicon," i.e. by means of rules, separate from those of syntax, whose inputs and outputs are both objects in the Lexicon. Two verbs, any two X_o's, can combine in syntax. Also, much of Thompson and Lord's most interesting data, showing that verbs have requirements in simple sentences that evaporate in CCs, can be seen as amplifying the main theme of this study.

[28]I will conclude in chapter 3 that the structure of an intransitive is the same as (89), just without the underlying subject.

now) requires the following pattern of construal. First, if the verb in M is one that necessarily enters thematic relation θ with the direct object in simple clauses, then it enters θ with the direct object in the CC (Dowty 1979: 222, Carrier and Randall 1992: 187, Levin and Rappaport Hovav 1995: 39). Thus the object in (90), for example, can only be understood as the patient of cutting; an attempt to have it identify the instrument of cutting fails, (91). This observation will be developed throughout this dissertation, particularly in sections 2.2 and 2.9.2 of chapter 2.

(91) * Al cut his knife dull.

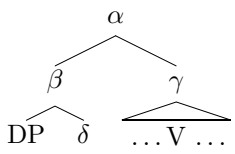
Second, the direct object must be interpreted as controlling R; control cannot go to the subject, (92). This reflects the so-called "direct object restriction" (Simpson 1983, Levin and Rappaport Hovav 1995), which will be the topic of section 3.2 in chapter 3.

(92) * Al cut pork chops weary.
Intended: 'Al made himself weary by cutting pork chops.'

Thus the construal of the object in (90) reflects systematic constraints, established in the grammar. The semantics assigns the object a thematic relation both to M and to R. Under a conventional understanding of compositionality and the structure of clauses, this entails that the object must c-command both predicates.[29] And so when

[29](93) abstracts over situations where a DP does not c-command a predicate V. Assume that V denotes in type $\langle \ldots \langle v, t \rangle \rangle$, and (for simplicity) that DP denotes in type $\langle e \rangle$. Compositionality says that the meaning of α is a function of the meaning of its immediate constituents, β and γ. Necessarily then, no relation can be compositionally established between the referent of DP and the event of V—except in a special case: β will have to refer to the same individual as DP does, or otherwise have a denotation that makes the DP referent accessible to predication.

(93)



there is mandatory sharing of the object, a structure like (89) is necessary.[30]

The same conclusion holds, notice, even if one assumes that the direct object has its interpretation by virtue of binding some sort of silent noun phrase (say, PRO) within either M or R. Presumably such binding itself requires c-command. No matter how object sharing is implemented, therefore—whether by assignment of thematic relations directly to the object, or by the object's control of silent pronouns in M or R—it requires that the object c-command both predicates.

For this reason, I will not entertain the possibility that English CCs might have a "Small Clause" analysis (Kayne 1985, Hoekstra 1988). This analysis gives CCs the basic syntax in (94), even when the means verb is transitive. R combines with the direct object, the resulting phrase then combines with the means verb to make a VP, and finally the VP combines with the subject.

(94) $[_{S}$ Subject $[_{VP}$ V_{means} $[_{SmallClause}$ Object R]]

Here the object noun phrase does not c-command the means verb. It follows that the grammar cannot establish a thematic relation between their meanings. The Small Clause analysis therefore predicts that English imposes no systematic constraints on the construal of the direct object with respect to M. And this is plainly wrong.

When there is no (grammatically mandated) sharing of the object, the semantic motivation for the position of the direct object in (89) is absent. Thus it is absent in the case of English examples like (95a), where the object has no thematic relation

Unless one can justify a meaning for δ which yields this sort of meaning of β, therefore, the DP cannot be assigned a thematic relation to V (i.e. it cannot be constrained to identify a certain participant in the V event). The default assumption is, there are no such meanings for δ; in general, we expect that a constituent containing a DP plus something else will not itself denote the same individual that is the referent of DP. And consequently it is the default assumption that a DP will c-command a predicate to which it is assigned a thematic relation.

[30] I will claim in chapter 2 that control of R sometimes follows from a grammatically assigned thematic relation, not to the event of R, but to the event of the entire complex CC predicate, viz. the event of causation. But this will not change the conclusions reached here. To be assigned a relation to the meaning of the CC predicate, the object will still have to c-command that predicate.

to M. More precisely, whatever understood relation is between Al's throat and his yelling, it is evidently not established by the grammar, since (95b) is ungrammatical.

(95) a. Al yelled his throat hoarse.

b. * Al yelled his throat.

So the semantics would permit a Small Clause analysis for these cases. Nevertheless I will assume the structure of (89) even here. Given that the AP flat does not combine immediately with a DP 'subject' in pound flat, it strikes me as syntactically implausible that the AP hoarse should do so in yell hoarse; there just isn't any formal motivation for it.

In Mandarin and Igbo, object sharing is never grammatically required, as chapter 2 will demonstrate in detail. In principle, the direct object can bear any (or no) thematic relation to M, even when M contains a basically transitive verb whose direct object in simple clauses has a fixed interpretation. (96) and (97) present one such example from each language, first Mandarin then Igbo.

(96) tā hái qiē dùn -le nǐde càidāo.
3s also cut dull -LE your food knife
'S/he also made your cleaver dull by cutting.'
(Adapted from Ma 1987: 428)

(97) O bi kpụ -rụ mma.
3sS cut blunt -FACT knife
'S/he made his knife blunt by cutting.'

Thus for Mandarin and Igbo, the semantic motivation for the position of the object in (89) is radically absent. For exactly this reason, Sybesma 1999 explores a Small Clause analysis for Mandarin.

But again, I will insist on (89). Partly this is because I am interested in the ideal assumption that the basic syntax of CCs is the same in Mandarin and Igbo as in

English, where the Small Clause analysis cannot be correct, certainly not when the means verb is transitive. But more importantly, the *syntax* of CCs in these languages is what we expect given (89), and not what we expect under alternatives like the Small Clause analysis.

This is best illustrated by considering the distribution of aspectual suffixes like the Mandarin perfective -le, and the Igbo factative -rV. The placement of these suffixes treats the M and R verbs as unit. They follow both verbs, and do not occur between them. This is compatible with the assumption that M and R form a constituent to the exclusion of the direct object; and it is the predicted order if this constituent has the distributional profile of a single verb. For then we can say that the suffixes follow the first verbal unit, whether it is complex, (98), or simple, (99).

(98) a. tā tī duàn -le nàtiáo mùbǎn.
3s kick snap -PFV that plank
'S/he made that plank snap by kicking.'

b. Ọ kụ wa -ra ọba ahụ.
3sS strike split -FACT gourd that
'S/he made that gourd split by striking.'
(ex. Hale, Ihiọnụ, and Manfredi 1995, tr. AW)

(99) a. tā tī -le nàtiáo mùbǎn.
3s kick -PFV that plank
'S/he kicked that plank.'

b. Ọ kụ -rụ ọba ahụ.
3sS strike -FACT gourd that
'It struck that gourd.'

Under the Small Clause analysis, there is no single node in the underlying structure that dominates just the two verbs, to the exclusion of the object. The second verb is structurally embedded with respect to the first, inside a phrase that contains a full

argument NP. On general grounds, we would therefore expect the aspectual suffixes to associate with the higher verb alone, as in (100). But they don't.

(100) a. * tā tī -le duàn nàtiáo mùbǎn.
3s kick -PFV snap that plank
Intended: 'S/he made that plank snap by kicking.'

b. * Ọ kụ -rụ wa ọba ahụ.
3sS strike -FACT split gourd that
Intended: 'S/he made that gourd split by striking.'

To cope with this problem, the Small Clause analyst will posit a transformation that brings M and R together under one node. Sybesma (1999), for example, has the R verb raise out of its base position and adjoin to the node that contains M.[31] The distribution of the verbal suffix is then expected, since the two verbs form a unit. But the proposed movement is implausible, since it never strands any modifiers of the putative result VP, (101).

(101) * tā zá píng -le (feīcháng) nàkuài ròu (feīcháng).
3s pound flat -PFV (extremely) that meat (extremely)
Intended: 'S/he made that meat extremely flat by pounding.'

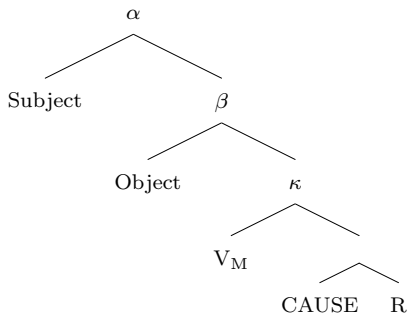
Stipulations can of course be made that forbid stranding of adverbs. I prefer to avoid such ad hoc stipulations by just assuming an analysis that predicts the observed facts directly, like (89). M and R form a unit at the outset, and so the grammar will treat them as such.

[31]Such movement adjoins one nonaffixal root to another, and as such constitutes *incorporation* (Baker 1988). It is not head movement of the classical sort, which cannot adjoin one root to another unless one is silent or affixal. The well-known accounts of verb movement in English, French, and German, for example, all assume that it is head movement and not incorporation. I am not inclined to believe that Mandarin and Igbo are any different. Thus in chapter 4 I will suggest that incorporating verb movement is not permitted in these languages either, contra (e.g.) Sybesma 1992 and Ihiọnụ 1992.

1.6.3 Inside M and R

(89) says that the overt NP that is the direct object of the CC clause c-commands both M and R. This leaves open the possibility that M and R themselves contain silent NPs, possibly or mandatorily anaphoric to the overt object. Yet I will make the further assumption that neither one does, at least not in English, Igbo, or Mandarin. For all three languages I adopt a complex predicate analysis as in (102).

(102)



In English R is a nonverbal XP, while in Igbo and Mandarin it is a verb root simply; we can tell the difference because R allows modifiers in English, but not in Mandarin or Igbo. But in neither case does R contain a silent pronoun anaphoric to the object. Thus CCs in all three languages involve what is called "nuclear juncture" in the Role and Reference Grammar literature (Foley and Van Valin 1984, Foley and Olson 1985, Van Valin and La Polla 1999).[32]

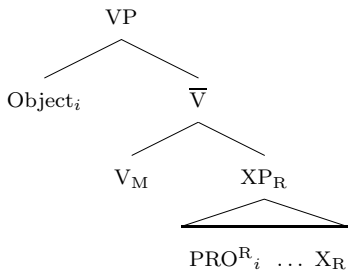
This goes against a proposal, common in the literature, that complex causative VPs have the structure in (103). Here R does contain a silent pronoun, which I

[32]Nuclear juncture is a syntactic relation between two nuclei, yielding a complex nucleus (Van Valin and La Polla 1999). A single, simple nucleus comprises a lexical predicate (a verb, for example), and possibly certain modifiers or aspectual operators, but no more. In particular, a nucleus contains no argument phrases, even when, semantically, the nucleus has lexical arguments. In general, RRG analyses presume a comprehensively projectionist encoding of thematic relations.

It is worth making this connection, because much excellent research on CCs and serial verb constructions has been carried out in the RRG framework, or under its influence (e.g. Foley and Olson 1985, Crowley 1987, Kuhn 1990, Bisang 1992, Durie 1994, Solnit 1997, Björverud 1998, Hyslop 2001, Crowley 2002).

refer to as PRO^{R}, meaning 'the sort of silent anaphor one finds in R, and possibly elsewhere.'

(103)



In general the presence of PRO^{R} is motivated by a theoretical presumption that the head of R has a lexical argument that must be saturated by a noun phrase within the first maximal projection containing it.[33]

For Igbo and Mandarin, (103) faces a simple problem: R cannot contain any adverbial modifiers, as illustrated for Mandarin in (104).

(104) * tā zá feīcháng píng -le nàkuài ròu.
3s pound extremely flat -PFV that meat
Intended: 'S/he made that meat extremely flat by pounding.'

A phrase large enough to contain both a predicate and a pronominal argument, I assume, is large enough to allow at least some kinds of adverbs. If that's right, then R does not contain a silent argument NP. This position is strengthened by conclusions I reach later in this dissertation: I show that verbs in Igbo and Mandarin in general have no lexical requirement to cooccur with any arguments. The motivation for positing a PRO^{R} is therefore absent.

(103) does not face the same problem in English, where R may contain adverbial modifiers. But support for the presumption that motivates PRO^{R} is weak. In English, R is never headed by a verb. Typically it contains an adjective phrase or a

[33]Collins 1997 is among the rare cases which argues for the presence of PRO^{R} in R on direct, empirical grounds. His study concerns serial verb constructions in Ewe.

prepositional phrase. In the general case, APs and PPs exhibit no need for a local DP of which they can be predicated. A fortiori, the AP in (105a) and PP in (105b) are not predicated of any overt DP, and few would presume the presence of a silent pronominal argument.

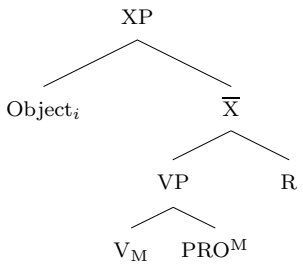
(105) a. the extraordinarily flat cutlet

b. The worm crawled into the wood.

Only when APs or PPs serve as the main predicate of a clause does it look like they predicate of a DP. But a predicate in R is not the main predicate of a clause. So there is no clear reason to posit PRO^{R}.

In any case, I will make little use of this conclusion. More consequential will be my assumption that there is no silent object pronoun in M, i.e. no PRO^{M}. VPs like (106) are excluded.

(106)



This should not be very controversial, since (106) is rarely assumed (though see Nishiyama 1998).[34] But the analysis is semantically workable, so we should want some plain evidence against it. I suggest that facts like (107) be counted as such.

(107) # Al took two hours to quickly pound the cutlet flat.
Intended: 'Al took two hours to make the cutlet flat by pounding quickly.'

[34]Carrier and Randall 1992 and Déchaine 1993 both assume that the means verb has a noun phrase sister. But for them, this is the overt direct object, not a silent pronoun controlled by a higher DP. For Carrier and Randall, the direct object controls a PRO in R, which they have as a third daughter of VP. For Déchaine, the object does not c-command R, but nevertheless controls the predicate directly, via a relation she introduces, called the "predication relation," or "π-relation." Roughly, NP and P are π-related just when NP is the nearest noun phrase that precedes and m-commands P.

(107) is absurd, since a two-hour ordeal of pounding a cutlet flat is not quick. This shows that quickly must describe this whole event of pounding flat, and cannot describe just its means event, the event of pounding. Thus the adverb cannot be contained within M. This would be surprising, I believe, if M were a full verb phrase, containing both a verb and a pronominal argument; such a phrase should allow adjunction of a manner adverb. I therefore conclude that (106) is impossible.

The same argument from adverbs can be made for Mandarin and Igbo. In these languages, moreover, the presumption that M contains just the means verb is crucial to the theory I develop in chapter 2. Insofar as that theory is explanatory, therefore, it supports the rejection of (106) and the adoption of (102).

Chapter 2

The No Argument Theory

2.1 Introduction

In Mandarin and Igbo, a verb is not subject to the same requirements in a CC as in a simple clause.[1] If a verb must find a patient in the object of a simple clause, for example, it need not do so when it serves as M in a complex causative. This pattern is systematic. So accounting for it will mean building a degree of freedom into the grammar somewhere. The theoretical question is, where? I argue that the facts are explained only if, characteristically, verbs in Igbo and Mandarin have no lexical arguments, neither agents nor patients. Thus a verb in M will not enter the same dependencies it enters simple clauses, because these do not project from the verb itself. They are imposed by the context in which it occurs. Thematic relations are introduced structurally, with respect to the maximal predicate in the VP. In a simple clause, that predicate contains just a single verb. So the verb in a simple

[1] In various versons, the material in this chapter was presented at: the University of Maryland (May 2005); the Workshop on Event Structure in Linguistic Form and Interpretation at the Universität Leipzig (March 2004); the University of Chicago (February 2004); and the Verb Meeting at the University of Pennsylvania's Institute for Research in Cognitive Science (November 2002). I thank the various audiences for their feedback. A large part of the chapter is to appear in a volume of papers from the Leipzig Workshop.

clause will find an agent in the subject and a patient in the object. But in a CC, the predicate is complex. So thematic relations are established to the event of the complex predicate (the event of causation) and not individually to the event of the verb embedded in M. Only this picture, we will see, provides both a nonstipulative account of the data and a simple description of cross-linguistic difference.

The plan of the chapter is this. I first sketch the facts of English in section 2.2, as a foil for what follows. Section 2.3 then details the data from Igbo and Mandarin; in this chapter I discuss only transitive CCs. My account of the facts, the no argument theory (NAT), is established in section 2.4, and alternatives are rejected in sections 2.5 and 2.6. The latter section dispels the suspicion that the behavior of Igbo and Mandarin CCs derives from the fact that they are 'compounds,' comprising two verbal heads. Section 2.7 shows how the distribution of patients can be encoded in a nonprojectionist theory, and without forgoing an explanatory relation to meaning. I sum up the discussion in section 2.8, and oppose my conclusions to conceptual arguments against the use of general thematic relations, particularly a general *patient* relation (cf. Kratzer 2003). Finally in section 2.9 I return to English. In 2.9.1 I outline derivations for English CCs within the framework of section 2.4, and in 2.9.2 I handle apparent counterexamples to the observations of section 2.2.

2.2 English CCs and verbal valence

It will be useful to consider English as a counterpoint to Igbo and Mandarin. We will see that, in English, the grammar of CCs can be used to argue that at least patients are arguments of the verb, and maybe agents too.

In English, a verb is typically subject to the same requirements in an CC as in a simple clause. A verb will require a patient (or theme) when in M, for example,

to the same extent, and under the same conditions, that it requires one in a simple clause (Dowty 1979: 222, Carrier and Randall 1992: 187, Levin and Rappaport Hovav 1995: 39, but cf. Boas 2003: 113). The verb yell, for example, does not require identification of its theme (i.e. that which is yelled) in simple clauses, (108), and the same is true in CCs, (109).

(108) Al yelled.

(109) Al yelled his throat hoarse.

The verb hammer generally does occur with an object naming the patient of hammering. But sometimes, particularly when the hammering is repetitive, the patient may go unexpressed, (111). Again, this is true in CCs as in simple clauses. (112) does not tells us what was hammered, but it is acceptable, at least marginally, if the hammering is repetitive.[2]

(111) Al hammered ?(nails).

(112) ? Al hammered his wrist sore.

Finally, verbs like cut and carry do not tolerate drop of their patients in simple clauses (113), and the same intolerance is shown in CCs (114). Carrier and Randall (1992: 187) illustrate the same point for the verb frighten, (115).

[2]The acceptability of (112), such as it is, appears to depend on the fact that Al's wrist, while the not the patient of hammering, is nevertheless involved in this action centrally. When the involvement of the object-referent is only incidental, the CC is bad, even if the means verb is one that conditionally allows its patient to go unidentified in simple clauses. Nearly every native speaker of English I have asked, myself included, rejects (110) under the intended interpretation; it can only mean that the roofers hammered Al.

(110) * The roofers hammered Al awake.
Intended: 'The roofers made Al awake by hammering stuff [not him].'

Similar sentences are apparently possible in German; see Wunderlich 1997 and Rapp 1997. By itself, this not important. What matters is whether the conditions on 'dropping an object' are essentially the same in simple clauses and CCs. I will not pursue this question for German.

(113) a. Al cut *(the frozen meat).

b. Al carried *(the luggage).

(114) a. * Al cut the knife dull.

b. * Al carried his neck sore.

(115) a. The bears frightened *(the campers).

b. * The bears frightened the campground empty.

Thus in each case the behavior of the verb in CCs corresponds to its behavior in simple clauses.

The same pattern governs grammatical relations. A verb in M will find its thematic relata bearing the same grammatical relations in the CC clause that they would have in a simple clause. In the simple clauses (116a) and (117a), yell and pound find their agent in the subject and their (theme or) patient in the object; the opposite arrangement is impossible, (116b, 117b).

(116) a. Al yelled slogans.

b. * The slogans yelled Al.
Intended: 'Al yelled the slogans.'

(117) a. Rocky's fists pounded the frozen meat.

b. * The frozen meat pounded Rocky's fists.

Just so, neither verb can occur in a CC where the object names its agent and the subject names its (theme or) patient, (118, 119). Notice that the intended meanings here are entirely plausible.

(118) * The slogans yelled Al hoarse.
Intended: 'The slogans made Al hoarse by his yelling them.'

(119) * The frozen meat pounded Rocky's fists bloody.
Intended: 'The meat made the fists bloody by their pounding it.'

So far, the data have concerned only patients and objects. But essentially the same observations apply to agents and subjects. A verb will require or refuse an agent to the same degree in M as in simple clauses. Compare pound, freeze, and swell for example. In simple clauses, pound must enter an agent relation with an argument NP, (120); freeze may or may not, (121); and swell cannot, (122).

(120) a. Al pounded the cutlet.

b. * The cutlet pounded.
Intended: 'The cutlet suffered pounding.'

(121) a. Neptune froze the lake.

b. The lake froze.

(122) a. * The mustard gas swelled his eyes.

b. His eyelids swelled (from the mustard gas).

The same is true in CCs. Only when the verb in M can occur without an agent in simple clauses can it occur without an agent in a CC—at least in an *intransitive* CC.

(123) a. Al pounded the cutlet flat.

b. * The cutlet pounded flat.

(124) a. Neptune froze the lake solid.

b. The lake froze solid.

(125) a. * The mustard gas swelled his eyelids shut.

b. His eyelids swelled shut.

Intransitive CCs are the topic of chapter 3, and I will not discuss data like (123b), (124b), and (125b) directly until then. But notice that, again with agents as with patients, the relation between thematic and grammatical relations remains constant. A verb that finds an agent in the subject of a simple clause will find it in the subject of a CC, as already illustrated in (118) and (119). (126) gives another example, one where the subject cannot be interpreted as the logical object of the means verb.

(126) * The violent singing yelled Al hoarse.

When a verb is subject to the same argument requirements in both simple clauses and RCs, I will say that it shows *uniform projection*. And when it is characteristic of a language that its verbs show uniform projection, I will say that the language has the *uniform projection property*, or UPP. Thus English has the UPP. Knowledge of this is revealed by our reaction to a quote attributed to Mormon pioneer Brigham Young, (127).

(127) "'God almighty will give the United States a pill that will puke them to death,' Young said during tensions in the late 1850's."
(T. Egan, *New York Times*, 3 February 2002)

From this unusual sentence we deduce immediately that Young's grammar must have allowed sentences like (128), which for us are ungrammatical. Were the UPP not a characteristic of English, the strength of this inference would be surprising.

(128) * This bitter pill will surely puke you.
(Hypothesis: Brigham Young would have judged this acceptable.)

There are some cases in English which seem to go against the UPP. I will leave these for section 2.9.2, where I argue that they do not in fact overturn the generalization. By then, moreover, any desire to challenge the UPP will have faded, squelched by the contrast with Igbo and Mandarin. If English did not have the UPP, we will come to see, it should behave like these languages. But it doesn't.

In light of the discussion in section 1.4 of chapter 1, it should be clear how the UPP can be used to argue for a projectionist model. If argument requirements are assigned to the lexical representation of the verb, we expect them to be expressed wherever the verb occurs. Thus a projectionist model predicts (and in this sense explains) uniform projection.[3] Moreover, by assigning the English verbs patient and agent arguments lexically, we account for how the subject and object even can be constrained to bear these relations to M, despite being generated outside the complex causative predicate, as I presume they are. For just these reasons, English CCs have been take to support a projectionist model of argument relations in this language, most emphatically in Levin and Rappaport Hovav 1995 (chapter 2). The same reasoning will favor a nonprojectionist model for Mandarin and Igbo.

2.3 Arguments in Igbo and Mandarin

In this section we will see that Igbo and Mandarin do not have the UPP. Systematically, verbs that must cooccur with a patient in simple clause have no such requirement in CCs.

2.3.1 Unrealized patients

In both Mandarin and Igbo, a verb that must cooccur with a patient in simple clauses need not do so when serving as M in a CC.

For Mandarin this observation is commonplace (L. Li 1980, Lü 1986, Ma 1987, Tan 1991, among others). Take the verb qiē 'cut,' for example. In simple clauses,

[3]We should remind ourselves that the UPP can provide evidence for a projectionist model only if the CC has the structure of a complex predicate, with the means verb combining directly with R. If instead it combines first with an object NP, as argued in Carrier and Randall 1992, then the local syntactic context of the verb will be the equivalent in CCs and in simple clauses. And in that case we would expect the UPP pattern, whether the arguments project from the verb or not. See sections 1.4 and 1.6 of chapter 1.

(129–131), it requires an object naming the patient of cutting. Thus sentences like (130) or (131) can only be analyzed as including a silent object pronoun, referring to some individual salient in the discourse. They cannot mean simply that there was an event of Lao Wei cutting something, or that there is such an event ongoing.

(129) Lǎo Wèi qiē -le zhúsǔn.
L.W. cut -PFV bamboo shoot
'Lao Wei cut bamboo shoots.'

(130) * Lǎo Wèi qiē -le.
L.W. cut -PFV
Intended: 'There was an event of cutting with Lao Wei its agent.'
Can mean: 'Lao Wei cut *it*.'

(131) * Lǎo Wèi zài qiē.
L.W. PROG cut
Intended: 'There is an ongoing event of cutting with Lao Wei its agent.'
Can mean: 'Lao Wei is cutting *it*.'

When qiē 'cut' is the means verb of a CC, however, no such requirement holds. The CC in (132), for example, can mean just that the subject made the knife dull by cutting something. No noun phrase names what is cut.

(132) tā hái qiē dùn -le nǐde càidāo.
3s also cut dull -LE your food knife
'S/he also made your cleaver dull by cutting.'
(Adapted from Ma 1987: 428)

(132) does not contain a silent object pronoun, referring to the patient. Syntactically the sentence has no space for a second object, (133).

(133) * tā hái qiē dùn -le (zhúsǔn) nǐde càidāo (zhúsǔn).
3s also cut dull -LE (bamboo) your food knife (bamboo)
Intended: 'S/he also made your cleaver dull by cutting bamboo.'

Pragmatically, moreover, (132) is not constrained to occur only in a context that would license silent pronominal reference to the patient of cutting. The context of (134a), for instance, does not license pronominal reference to anything but the cleaver, yet (134b) is felicitous nonetheless.

(134) a. càidāo zěnme huíshì a?
cleaver how happened PRT
'What happened with the cleaver?'

b. Lǎo Wèi qiē dùn -le *pro.*
L.W. cut dull -PFV it
'Lao Wei made it dull by cutting.'

Should the speaker of (132) want to identify what was cut, this can be done (among other ways) by adjoining an adverbial verb phrase, as in (135). Yet regardless of whether this addition is required by the conversation, it is not required by the syntax.[4]

(135) Lǎo Wèi qiē zhúsǔn, qiē dùn -le càidāo.
L.W. cut bamboo shoots, cut dull -PFV food knife
'Cutting bamboo shoots, Lao Wei made the cleaver dull by cutting.'

Finally we cannot say that the direct object in (132), càidāo 'cleaver,' is itself an argument of the means verb. The cleaver is indeed the instrument of the means event; but in simple clauses qiē 'cut' cannot take an instrument as its direct object, (136).

(136) * tā qiē -le nǐde càidāo.
3s cut -LE your food knife
Intended: 'S/he cut [stuff] with your cleaver.'

[4]Such VPs are considered adjuncts not only because they can be dropped, but also because they cannot include aspectual suffixes or modal verbs.

This pattern is systematic. With few exceptions, any verb in M can occur without the patient argument required in simple clauses. (137–140) give further examples.

(137) wǒ cā zāng -le liǎngkuài móbù.
1s wipe dirty -PFV two towels
'I made two towels dirty by wiping.' (Wang 1995: 148, tr. AW)

(138) tā pāi téng -le shǒu.
3s smack hurt -PFV hand
Can mean: 'S/he made her/his hand hurt by smacking [something else].'
(Adapted from L. Li 1980: 98, tr. AW)

(139) tī qiú, tī qiú, yīge yuè tī huài -le sān shuāng xié.
kick ball, kick ball, one month kick bad -PFV three pair shoe
'S/he kicked balls, and kicked balls, [so] in one month s/he made three pairs of shoes go bad by kicking.' (Lü 1986: 5, tr. AW)

(140) tā mǎi kōng -le qíanbāo.
3s buy empty -PFV wallet
'He bought (so much that) his wallet (got) empty.'
(ex. & tr. Tan 1991: 100)

It can be shown, just as it was for (132), that none of these CCs includes a noun phrase naming the patient (or theme) of the means event; yet in each case M is a verb that must cooccur a patient (or theme) argument in simple clauses, and cannot take an instrument as its direct object.

Igbo displays the same pattern as Mandarin, just as systematically. A verb required to cooccur with a patient in simple clauses is subject to no such requirement when in M. Take the Igbo verbs bi 'cut' and gwu 'dig out,' for example. In simple clauses like (141) and (142), these verbs must cooccur with an argument noun phrase that identifies what was cut or what was dug out.

(141) O bi -ri osisi.
3sS cut -FACT wood
'S/he cut wood.'

(142) O gwu -ru ji.
3sS dig out -FACT yam
'S/he dug up yams.'

Unlike Mandarin, Igbo has no silent object pronouns; so (143) and (144) have no grammatical analysis at all (see Nwachukwu 1987: 126 on the lack of "object drop" in Igbo simple clauses).

(143) a. * O bi -ri (ebi).
3sS cut -FACT (BVC)
Intended: 'There was an event of cutting with him its agent.'

b. * Ọ na e- bi (ebi).
3sS PROG SBRD- cut (BVC)
Intended: 'There is an ongoing event of cutting with him its agent.'

(144) a. * O gwu -ru (egwu).
3sS dig out -FACT (BVC)
Intended: 'There was an event of digging out with him its agent.'

b. * Ọ na e- gwu (egwu).
3sS PROG SBRD- dig out (BVC)
Intended: 'There is an ongoing event of digging out with him its agent.'

Yet when bi 'cut' and gwu 'dig out' appear in M, there is no need for a patient. (145) and (146) are perfectly natural, despite the absence of any noun phrase identifying what was cut or what was dug out.

(145) O bi kpụ -rụ mma.
3sS cut -blunt -FACT knife
'S/he made his knife blunt by cutting.'

(146) O gwu ji -ri ọgụ.
3sS dig out snap -FACT hoe
'S/he made the hoe snap by digging out.'

Again, these are not cases of silent anaphora, since Igbo has no silent object pronouns. Nor do they express alternative argument structures for bi 'cut' and gwu 'dig out,' alternatives which select an instrument rather than a patient as object. In simple clauses an instrumental object is impossible, (147, 148).

(147) * O bi -ri mma (n' osisi).
3sS cut -FACT knife (P wood)
Intended: 'S/he cut with a knife (at wood).'

(148) * O gwu -ru ọgụ (na ji).
3sS dig out -rV hoe (P yam)
Intended: 'S/he dug with his hoe (at yams).'

We can only conclude that the requirement associated with these verbs in simple clauses is absent in CCs. Should the speaker want to identify the patient of the means event, this can be done by means of an adjunct PP, as in (149) and (150).

(149) O bi kpụ -rụ mma n' osisi.
3sS cut blunt -FACT knife P wood
'S/he made his knife blunt cutting wood.'

(150) O gwu ji -ri ọgụ na ji.
3sS dig out snap -FACT hoe P yam
'S/he made the hoe snap digging up yams.'

But the addition of this information is not syntactically required.

The behavior of bi 'cut' and gwu 'dig out' is in no way exceptional. Verbs that require a patient in simple clauses do not when in M, quite generally. Three more examples are given in (151–153).

(151) Ọ sọ ja -ra osisi.
3sS poke splayed -FACT wood
'S/he made the stick splay by poking [with it].'
(Can also mean: 'S/he splayed the stick by poking it.')

(152) O de ji -ri pensul.
3sS write snap -FACT pencil
'She made the pencil (nib) snap by writing.'

(153) O bu ṅo -ro olu (n' ibu).
3sS carry sore -FACT neck (P load)
'She made her neck sore by carrying (a load).'

In none of these CCs is there a noun phrase identifying the patient of the means event. Yet sọ 'poke,' de 'write,' and bu 'carry (on the head)' are all verbs that require a patient in simple clauses, and cannot take an instrument as object.

2.3.2 Patients in unexpected places

The suspension of simple-clause requirements is also evident in the correspondence between thematic and grammatical relations. A verb constrained to find its patient in the direct object of a simple clause may seem to find a patient in the subject of a CC.

For Mandarin this has been observed in L. Li 1980, Lü 1986, Ma 1987, Tan 1991, and elsewhere; the most widely known discussions are in Y. Li 1990 and 1995. Consider (154–156) for example.

(154) jiějiě xǐ -le yīfú.
elder sister wash -PFV clothes
'Big sister washed (the) clothes.'

(155) * yīfú xǐ -le jiějiě.
clothes wash -PFV elder sister
Intended: 'Big sister washed the clothes.'

(156) yīfú xǐ lèi -le jiějiě.
clothes wash tired -PFV elder sister
Can mean: 'The clothes made big sister tired by [her] washing [them].'
(Ren 2001: 326, tr. AW)

In simple clauses, (154,155), the verb xǐ 'wash' is constrained to find its patient in the object and its agent in the subject. Yet in the CC (156), the subject is understood as naming the patient of the means event, and the object, its agent: big sister washes the clothes. So constraints on the correspondence between grammatical and thematic relations in simple clauses are apparently voided when the verb is in M.[5]

Tan 1991 suggests that sentences like these reflect the possibility of the verb in M occurring intransitively and nonagentively, as in (159).[6]

(159) yīfú xǐ -le.
clothes wash -PFV
'The clothes are washed.'

She then proposes that, in CCs like (156), the means verb occurs in its intransitive guise, and consequently assigns its patient role to the subject. But this cannot be

[5]The same point can be illustrated for Cantonese with the following sentence quoted in Matthews and Yip's grammar of spoken Cantonese (1994: 155), (157). Cantonese is a southern Sinitic language of the Yue branch, spoken mainly in Hong Kong and the adjacent province of Guang Zhou.

(157) gojek laaih-fan hou yuhngyih sihk feih di bibhi.
that milk-powder very easily eat fat CLS baby
'That milk powder easily makes babies fat.'

(158) * gojek laaih-fan sihk di bibhi.
that milk-powder eat CLS baby
Intended: 'Babies eat that milk powder.'

[6]Tan demonstrates that sentences like (159) do indeed have an intransitive analysis, under which there is no silent pronoun referring to an agent, and the patient NP is the (surface) subject. I discuss the issue directly in chapter 3.

correct. Construed as nonagentive intransitives, sentences like (159) have a result-state interpretation. (159) means that the clothes are in the state that results from washing, for example. Yet this meaning is no part of (156). (156) does not mean: 'The clothes *being in a washed state* made big sister tired.' It means rather that *washing* the clothes made her tired. The contribution of the means verb here is eventive, and not (result-) stative. Thus we should assume that the verb in (156) is eventive transitive of (154) and not the result-state intransitive of (159).

(161) makes the same point as (156), but with a twist. Here M is xià 'fall,' a nonagentive intransitive which appears to be unaccusative. In simple clauses, xià 'fall' commonly occurs with its patient (or theme) in the direct object, (162). But in (161) it is the subject that tells us what falls.[7]

(161) mì yú xià hēi -le tiāndì.
dense rain fall black -PFV earth
'The dense rain made the earth dark by falling.'
(L. Li 1980, quoting from Zhou Libo's *Baofeng Zhouyu*)

(162) xià -le yú.
fall -PFV rain
'Rain fell.' (i.e., 'It rained.')

The fact that CCs like (161) are not possible in English, (163), might be taken to follow from basic constraints on semantic structure (see the discussion of Van Valin's views in Levin and Rappaport Hovav 1995: 71–72).

(163) * The tree fell the car flat.
Intended: 'The tree made the car flat by falling.'

[7]Mandarin also allows stative verbs in M, with the subject being the holder of the state, (160). I have found no similar examples in Igbo.

(160) nà wǎn māpodòfu là -kū -le xǐao haízi.
that bowl Mapo Tofu hot -cry -PFV small child
'That bowl of Mapo Tofu made the child cry by being so hot.'

That they are possible in Mandarin (and in Igbo as well, as we will see) shows that this is wrong. (163) violates no universal principle of semantics. It is simply inconsistent with whatever aspect of English grammar explains the UPP.

Now let us turn to Igbo. All Igbo speakers I consulted accept (166). M here is da 'fall,' and the subject of the CC identifies what falls. It is at least reasonable to assume that da 'fall' is unaccusative; that is, that the surface subject in (167) is the direct object of the clause underlyingly. If that assumption is correct, then (166) shows that the requirements associated with the verb in simple clauses are absent in CCs.[8]

(166) Osisi da bi -ri eriri.
tree fall in pieces -FACT rope
'The tree made the rope go to pieces by falling.'

(167) Osisi da -ra ada.
wood fall -FACT BVC
'The tree fell.'

My interviews with Igbo speakers have hinted that sentences like Mandarin (156) are possible as well: transitive CCs where the subject identifies the patient of the

[8]Sentence (164) can mean that the farmer made the tree split by falling into it. But only one of the Igbo speakers I consulted accepted (164) with the interpretation in the gloss. Here the direct object is meant to identify the patient of the means event, and the subject is meant to identify the agent of M causing R.

(164) % Onye ọlụ ubi da ji -ri osisi.
farmer fall split -FACT tree
Intended: 'The farmer split the tree by making it fall.'

This is not as I would expect, given my general description of Igbo CCs. Interestingly, however, even the speaker who did allow (164) strongly rejected (165), again indicating the important contrast between simple clause and CC environments.

(165) * Onye ọlụ ubi da -ra osisi.
farmer fall -FACT tree
Intended: 'The farmer made the tree fall.'

means event, but M is a transitive verb. Of the four speakers I consulted with most regularly, two accepted (168) and two rejected it.

(168) % Ji ahụ gwu ji -ri ogụ ya.
yam that dig out snap -FACT hoe 3sPOSS
'That yam made his hoe snap from digging out [i.e. from its being dug out].'

For those who accept this sentence, the subject, ji ahụ 'that yam,' is understood as the patient of the means event: the yam is what was dug out. In simple clauses, however, gwu 'dig out' must find the patient of digging in the object, (169).[9]

(169) a. O gwu -ru ji.
3sS dig out -FACT yam
'S/he dug out yams.'

b. * Ji ahụ gwu -ru ya.
yam that dig out -FACT 3s
Intended: 'S/he dug out that yam.'

So for some speakers of Igbo, constraints on the correspondence between thematic and grammatical relations are relaxed when a verb appears in a CC. I do not know what

[9]One of the speakers who accepted (168) also accepted (170). This sentence could not be tested with my other consultants, however, as their dialects do not include the verb ṅo 'tired, sore' (Green and Igwe 1963: 232, Igwe 1999: 559).

(170) Ibu bu ṅo -ro ya olu.
load carry sore -FACT 3s neck
'The load made his neck sore from carrying.'

Here M is bu 'to carry on the head', and the subject names what is carried. But this is impossible when bu is on its own, (171).

(171) * Ibu bu -ru ya.
load carry -FACT 3s
Intended: 'S/he carried the load.'

The speaker who accepted (170) grew up in the Isu-ikwu-ato region of an area now known as Ambiya, formerly a part of Imo State. The dialect studied in Green and Igwe 1963 was spoken "near Umuahia by the people known as Ọ̃hụ̃hụ̃" (1963: xiii).

to make of the disagreement among speakers. But it is interesting that (168) was sensible to any speakers at all. Contrast the English calque in (172), which provokes only bafflement.

(172) * That yam dug his hoe apart.

2.3.3 Agents, missing or displaced

In both Mandarin and Igbo, it is common for a verb which must cooccur with an agent in simple clauses to occur without one in an *intransitive* CC, (173). But intransitive CCs, where the subject controls R, need to be discussed on their own terms, and will be in chapter 3.

(173) a. hēibǎn cā gānjing -le.
blackboard wipe clean -LE
'The blackboard got clean from wiping.' (H. Huang 1982: 56; tr. AW)

b. ?* hēibǎn cā -le.
blackboard wipe -PFV
Intended: 'The blackboard underwent wiping.'
Can mean: 'The blackboard, *pro* wiped.'

(174) a. Ọba ahụ kụ -wa -ra akụwa.
gourd that strike -split -FACT BVC
'That gourd split from striking.'

b. * Ọba ahụ kụ -rụ akụ.
gourd that strike -FACT BVC
Intended: 'That gourd underwent striking.'

Within the domain of *transitive* CCs, the data concerning the distribution of agents for M is more subtle.

In Mandarin it does seem possible to have a transitive CC where no NP identifies the agent of the means event, despite M being a verb that never occurs without an

agent in simple clauses. (175) is an example often cited in the literature (see Gu 1992: 27). M here is kū 'cry.' In simple clauses this verb must occur with a subject that identifies the agent of crying, (176), certainly if it is to describe an *event* of crying, as it does in (175). But in (175) no argument noun phrase refers to the cryer. We know who cried only by inference, from the fact it was Lisi's eyes which were reddened by the crying.

(175) zhèjiàn shì kū hóng le Lǐsì-de yǎnjīng.
this matter cry red PFV L-'s eyes
'This matter made Lisi's eyes red from crying.' (Huang 1988: 296, tr. AW)

(176) * yánlei kū -le.
tears cry -PFV
Intended: 'There was crying of tears.'
Can mean: '*pro* cried tears,' and perhaps, very marginally: 'The tears are in the state of having been cried.'

Notice that the subject here appears to have no thematic relation to the means event, certainly not one that can be assigned to an argument in simple clauses with kū 'cry.' Its only clear relation is to the event of causation, of which it is the agent. I return to this observation below, in section 2.3.4.

In Igbo, examples that make exactly the same point as (175) are hard to come by. One possible example is (177), which repeats (168). For speakers who accept this sentence, the verb gwu 'dig out' occurs without any noun phrase identifying the agent of digging. Yet this is impossible in simple clauses, (178).

(177) % Ji ahụ gwu ji -ri ogụ ya.
yam that dig out snap -FACT hoe 3SPOSS
'That yam made his hoe snap from digging out.'

(178) * Ji ahụ gwu -ru.
yam that dig out -FACT
Intended: 'There was an event of digging out with that yam its patient.'

Turning to the relation between thematic and grammatical relations, Mandarin shows clear cases of agents being realized in unexpected positions. (156) is such an example; I repeat it as (179). Here the direct object is understood as naming the agent of the means event, even though this is impossible in simple clauses, (180).

(179) yīfú xǐ lèi -le jiějiě.
clothes wash tired -PFV elder.sister
'The clothes made big sister tired by [her] washing [them].'
(Ren 2001: 326, tr. AW)

(180) * yīfú xǐ -le jiějiě.
clothes wash tired -PFV elder.sister
Intended: 'Big Sister washed the clothes.'

I have found no comparable examples in Igbo, examples where the object clearly identifies the agent of M. In (177) the object identifies the instrument of the means event, not its agent. If it were understood as the agent, we would expect the sense of metonymy or personification that attends (181). But this is absent from (177); to those who accept it, this sentence does not depict the hoe as doing its own digging.

(181) ? Ọgụ ya gwu -ru ji ndịa.
hoe 3s dig out -FACT yam these
'His hoe [magically] dug out these yams [on its own].'

Further research is required to determine whether this gap in the Igbo data is accidental or principled. If it turns out to be principled, it will be important to account for it.

2.3.4 Summary of the data

The thematic relations an Igbo or Mandarin verb must enter in simple clauses, it need not enter when in the means predicate of an CC. Correspondingly, while the interpretation of subject and object is fixed with respect to the verb in a simple clause, it is largely free with respect the means verb in a CC.

At the same time, two correlated aspects of interpretation remain fixed. The subject names the agent of the event of causation, and the object names the thing caused to enter the result state defined by R. I develop both these observations more fully in chapter 3. But here it is enough to compare the four Mandarin examples in (182–185), which repeat sentences discussed above.

(182) tā tī duàn -le nàtiáo mùbǎn.
3s kick snap -PFV that wooden plank
'S/he made that plank snap by kicking.'

(183) Lǎo Wèi qiē zhúsǔn, qiē dùn -le càidāo.
L.W. cut bamboo shoots, cut dull -PFV food knife
'Cutting bamboo shoots, Wei made the cleaver dull by cutting.'

(184) yīfú xǐ lèi -le jiějiě.
clothes wash tired -PFV elder sister
Can mean: 'The clothes made big sister tired by [her] washing [them].'
(Ren 2001: 326, tr. AW)

(185) zhèjiàn shì kū hóng le Lǐsì-de yǎnjīng.
this matter cry red PFV L-'s eyes
'This matter made Lisi's eyes red from crying.'
(Huang 1988: 296, tr. AW)

The pattern of thematic relations to M varies from case to case, but the object always controls R, and the subject is always understood as the motive force behind the event of causation, a fact that is most pronounced in the last two examples (Huang 1988,

Y. Li 1990, Gu 1992). (184) presents the clothes as responsible for big sister getting tired from washing, and (185) presents 'that matter' as responsible for Lisi's eyes getting red from crying. That neither the dirty clothes nor the sad matter are the agent of the means event is a separate issue.[10]

Unlike thematic relations to the means event, these relations to the event of causation are never reversed (Y. Li 1995). The understood causer, for example, is never named by the object. And while it may happen that the sentence has no noun phrase naming the patient of the means event, the 'causee' in the event of causation is always identified overtly, namely by the phrase that controls R.

A theory of Igbo and Mandarin must therefore answer three questions. Why does the observed degree of freedom in interpretation obtain only in CCs? Why is interpretation in CCs free only with respect to the means event? And how are Igbo and Mandarin are different from English? I believe the only explanatory answers to these questions are provided by the theory I will now describe, the *No Argument*

[10]Although (185) is frequently cited in the literature, some speakers of Mandarin consider it awkward. A less awkward example that makes a similar point is (186), but this sentence requires some explanation.

(186) Zhāngsan! Nǐ dòng huài -le wǒ zheì kē baícaì !
Zh. 2s chill$_{intr.}$ bad -PFV 1s this head cabbage
'Zhangsan! You made this cabbage of mine go bad by freezing!'
(ex. adapted from Ma 1987:439; tr. AW)

The means verb here, dòng 'to chill' can be transitive or intransitive, exactly like its English translation. Corresponding to these two types of dòng are two meanings for (186). One entails (187), where dòng is transitive. But the other, represented by my translation for (186), does not. Zhangsan is said to have caused the cabbage to spoil by freezing, but he is not said to have chilled it.

(187) Zhāngsan dòng -le wǒ zheì kē baícaì
Zh. chill$_{tr.}$ -PFV 1s this head cabbage
'Zhangsan chilled this cabbage of mine.' (i.e. actively subjected it to cold)

The speaker can explicitly negate (187), but assert (186) nontheless, perhaps reprimanding Zhangsan for not noticing that that cabbage lay outside in the snow. Thus in the simple transitive clause (187), dòng requires the subject to be understood as an active agent of chilling; but in the M position of the CC (186), it does not. In the latter case, Zhangsan has no thematic relation to the means event; he is *only* as the agent of causation.

Theory for Igbo and Mandarin, or NAT.

2.4 The No Argument Theory

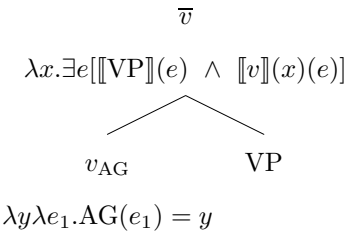
The facts of section 2.3 follow directly if we assume that patients, as well as agents, are not arguments of the verb in Igbo and Mandarin.[11] The typical verb in these languages characteristically has no arguments lexically. That is, it has no lexical requirements to enter a particular thematic relation with any NP in the clause. Thus, given the representational assumptions described in section 1.3.3 of chapter 1, the typical verb simply denotes a sortal on events, as illustrated in (188) for verbs meaning 'cut.'

(188) Mandarin 'cut': $[\![\text{qiē}]\!] = \lambda e.cut(e)$

Igbo 'cut': $[\![\text{bi}]\!] = \lambda e.cut(e)$

Correspondingly, thematic relations are introduced by the environment the verb occurs in. Kratzer's (1996) proposal for introducing agents structurally is familiar and I will adopt it here. (189) sketches the proposal by pairing syntactic nodes with their interpretation. A v head denoting the agent relation combines with VP, and the resulting $\overline{v}$ is interpreted by a rule known as "event identification."

(189)

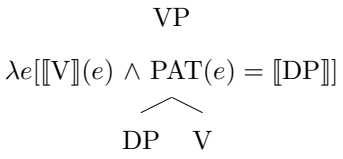


I add that, in Igbo and Mandarin, patient relations are also introduced structurally. This is done, I will assume, by means of a semantic rule that applies at VP, as in (190). Here I have the direct object as the specifier of VP, and preceding the verb,

[11] Lin 2001 arrives at similar conclusions for Mandarin, but by a very different route.

on the assumption that verb raising, presumably to v, will derive the correct surface order.[12] I also presume that rule (190) is an instance of a more general rule that applies whether VP combines its DP specifier with a V or with a $\overline{\text{V}}$.

(190)



Others might prefer to posit a head that denotes the patient relation, combining this with the verb by event identification, just as in the case of agents.

For a simple clause whose verb is Mandarin qiē 'cut' or Igbo bị 'cut,' (190) yields (191) as the denotation for VP. Plugging this into (189) then yields (192) for $\overline{v}$.

(191) $\llbracket\ [_{\text{VP}}\ \text{DP qiē }]\ \rrbracket = \llbracket\ [_{\text{VP}}\ \text{DP bị }]\ \rrbracket =$
$\lambda e.[cut(e)\ \wedge\ \text{PAT}(e) = \llbracket\text{DP}\rrbracket]$

(192) $\llbracket\ [_{\overline{\text{v}}}\ v_{\text{AG}}\ [_{\text{VP}}\ \text{DP qiē }]]\ \rrbracket = \llbracket\ [_{\overline{\text{v}}}\ v_{\text{AG}}\ [_{\text{VP}}\ \text{DP bị }]]\ \rrbracket =$
$\lambda x\lambda e.[cut(e)\ \wedge\ \text{PAT}(e) = \llbracket\text{DP}\rrbracket\ \wedge\ \text{AG}(e) = x]$

(192) states directly that the object DP is the patient of pounding, and the subject, when it comes along, will be its agent. The grammar thus predicts correctly that the interpretation of subject and object in simple clauses will be fixed.

But crucially, the same grammar yields a *vague* interpretation for subject and object in a CC, given two ordinary assumptions: the M verb and R constitute a complex predicate, and this predicate has the distribution of a simple verb.

If the M verb forms a complex predicate with R, it does not combine first with an object. In the present context, this means it does not first enter any structure

[12] This assumption is not significant for the semantics, but it is useful for certain syntactic purposes. It will permit a simple extension of the theory to handle the 'double unaccusative' CCs discussed in 3.3.5 of chapter 3. And it allows us to assign the same basic syntax to English, where M and R together constitute a phrase, as we assign to Mandarin or Igbo, where M and R appear to make a complex head (i.e. X_{o} category). See chapter 4.

that introduces a patient. Moreover, the minimal assumption about the semantics of combining M and R is that it introduces no content beyond the relation of causation. The smallest constituent containing both M and R, then, has the interpretation in (194).[13] I assume, recall, that the *CAUSE* relation here is introduced by a silent head, CAUSE, located between the two verbs. This head can be taken to denote as in (195); see section 1.5 of chapter 1.

(194) $[\![\text{ MR }]\!] = \lambda e \exists e_1 \exists e_2 [CAUSE(e, e_1, e_2) \wedge [\![\text{M}]\!](e_1) \wedge [\![\text{R}]\!](e_2)]$

(195) $[\![\text{ CAUSE }]\!] = \lambda R \lambda M \lambda e \exists e_1 \exists e_2 [CAUSE(e, e_1, e_2) \ \wedge \ M(e_1) \ \wedge \ R(e_2)]$

Given the lexical denotations in (196), therefore, the complex predicates qiē dùn 'cut dull' and bi kpụ 'cut dull' will denote as in (197).

(196) $[\![\text{ dùn }]\!] = [\![\text{ kpụ }]\!] = \lambda e.dull(e)$

(197) $[\![\text{ qiē dùn }]\!] = [\![\text{ bi kpụ }]\!]$
$= \lambda e \exists e_1 \exists e_2 [CAUSE(e, e_1, e_2) \ \wedge \ cut(e_1) \ \wedge \ dull(e_2)]$

The CC predicate thus denotes a predicate true of events e wherein one event e_1 causes another e_2—but it specifies no thematic relations to the means or result events individually.

Now let us assume that the minimal CC predicate has the same syntactic distribution as a simple verb. This assumption is common in the literature, where Igbo and Mandarin CCs are often described as compound verbs. Here it means that complex

[13] (194) is similar to Rothstein's rule of "resultative conjunction," (193).

(193) Resultative conjunction (Rothstein 2001: 158)
$A +_R B = \lambda y \lambda e. \exists e_1 \exists e_2 [(e = e_1 \sqcup e_2) \wedge (\text{CUL}(e_1) \sqsubseteq e_2) \ \wedge \ A(e_1, y) \ \wedge \ B(e_2, y)]$

(193) presupposes an analysis of what (194) has as "*CAUSE*" into a sequence of two relations, namely the first two conjuncts in the body of the formula. But we are free to import this analysis into (194). The only real difference between (194) and (193) is that (193) unifies the presumed internal arguments of M and R by lambda-abstraction, while (194) includes no such operation, since it combines verbs that have no internal arguments. If this difference is factored out, (194) and (193) can be seen as equivalent. See section 1.5 of chapter 1.

predicates like qiē dùn 'cut dull' and bi kpụ 'cut dull' will occur in the V slot of the VP structure in (190), yielding (198). Plugging this into the $\overline{v}$ structure of (189) yields (199) in turn.

(198) $[\![\ [_{\text{VP}}\ \text{DP}\ [_{\text{V}}\ \textsf{qiē dùn}\ ]]\ ]\!] = [\![\ [_{\text{VP}}\ \text{DP}\ [_{\text{V}}\ \textsf{bi kpụ}\ ]]\ ]\!] =$
$\lambda e \exists e_1 \exists e_2 . [\mathit{CAUSE}(e, e_1, e_2)\ \wedge\ \mathit{cut}(e_1)\ \wedge\ \mathit{dull}(e_2)\ \wedge\ \text{PAT}(e) = [\![\text{DP}]\!]\ ]$

(199) $[\![\ [_{\overline{\text{v}}}\ v\ [_{\text{VP}}\ \text{DP}\ [_{\text{V}}\ \textsf{qiē dùn}\ ]]]\ ]\!] = [\![\ [_{\overline{\text{v}}}\ v\ [_{\text{VP}}\ \text{DP}\ [_{\text{V}}\ \textsf{bi kpụ}\ ]]]\ ]\!] =$
$\lambda x \lambda e . [\mathit{CAUSE}(e, e_1, e_2)\ \wedge\ \mathit{cut}(e_1)\ \wedge\ \mathit{dull}(e_2)$
$\wedge\ \text{PAT}(e) = [\![\text{DP}]\!]\ \wedge\ \text{AG}(e) = x\ ]$

The VP and $\overline{v}$ structures introduce thematic relations. But as a matter of locality, these relations predicate of the main event of causation, and not of its subevents of means and result. The semantics thus tells us that the subject is the agent of causation and the object is its patient, but says nothing explicit about their relations to either the means or the result events. Interpretation with respect to these events is consequently free—except insofar as it is constrained, semantically and pragmatically, by being the agent and patient of a certain event of causation, with certain means and result components.

This predicted degree of vagueness is exactly what the Mandarin and Igbo data show, I suggest.[14] The subject and object of a CC may be construed as bearing any plausible thematic relation to the means event, or no relation at all, because the semantic representation insists on none in particular.

Construal with respect to the result event, on the other hand, is limited by the one purely semantic constraint that seems natural. Any definition of the basic predicates PAT and *CAUSE* should have (200) as a theorem.

[14]Sybesma (1999) has similarly suggested that vagueness is what is behind the facts of Mandarin, though his analysis of the CC is otherwise different.

(200) Patient of causation equivalence

If $CAUSE(e, e_m, e_r)$, then the patient of e is the patient of e_r.[15]

So if a plank is the patient of kicking causing snapping, then the plank is the patient of snapping, and hence winds up snapped. This is simply what it means to be the patient of an event of causation. Parsons makes essentially the same claim for his "Themes" of "BECOME" events—which, after all, can be regarded as events of causation with no means event or agent specified (Dowty 1979, Parsons 1990): "The Theme of [BECOME's] event is the same as the Theme of its Target state: $\text{BECOME}(e, s) \rightarrow [\text{Theme}(e, x) \equiv \text{Theme}(s, x)]$" (Parsons 1990: 119).

Given this semantics, it follows definitionally that the direct object in a CC, because it necessarily names the patient of the *CAUSE* event, also controls the result predicate R. Take (202), for example.

(202) a. Lǎo Wáng tī duàn -le nàtiáo mùbǎn.
L.W. kick snap -PFV that plank
'Lao Wang made that plank snap by kicking.'

b. $[\![(202a)]\!] = \exists e.[\text{CAUSE}(e, e_1, e_2) \ \wedge \ \textit{kick}(e_1) \ \wedge \ \textit{snap}(e_2)$
$\wedge \ \text{PAT}(e) = \textit{plank} \ \wedge \ \text{AG}(e) = \textit{laowang}]$

Here the object controls R, but not because the denotation in (202b) states any relation between the plank and the snapping. Rather, it establishes a patient relation between the plank and the event of kicking causing snapping. The relation to the snapping event, in virtue of which we say that the direct object controls R, is a

[15] As I state the patient of causation equivalence in (200), it applies whether the result event, e_r, is a state or an event, since I assume that the holder of a state is its patient (see section 1.5 of chapter 1). If this assumption is unacceptable, we can simply restate (200) less gracefully as (201).

(201) Patient of causation equivalence, version 2
If $CAUSE(e, e_m, e_r)$, then the patient of e is the holder of the result state in e_r.

definitional consequence. (I discuss control of R in English CCs below in section 2.9.1.)

Evidently the meaning of *CAUSE* does not entail identity between the agent or patient of causation and any particular participant in the means event. But there do seem to be default inferences; strongest among them, the inference that the agent of causation is in general the agent of the means event. This will be discussed briefly in section 3.3 of chapter 3.

2.5 Attractions and alternatives

Two aspects of the NAT are attractive. First, it relies on no special valence-reducing operations, posited ad hoc in the CC context, without morphological motivation. There is no formal indication that any such operation has applied to the verb in M, either passive or antipassive. Nor can the postulation of such operations in this context be justified on cross-linguistic grounds. I know of no CC in any language where the verb in M bears any morphological sign of argument suppression.[16] The direct approach of the NAT is therefore appealing. It accounts for the data just by defining the lexical primitives, and observing that CCs are complex predicates.

Second, the NAT implies a natural point of cross-linguistic difference. We can assume that Igbo and Mandarin differ from English just in the lexical valence of

[16]Hyslop's grammar of Ambae, an Oceanic language of Vanuata, includes the example CC in (203). Here the notional patient of the means verb tuli 'throw,' namely the man thrown, finds no expression, even though tuli is strictly transitive in simple clauses, and cannot 'drop' its patient.

(203) wai mo tuli waga tanga -na.
water REALIS throw break open testicles -3SPOSS
'The water threw [him] splitting open [his] testicles.' (ex. & tr. Hyslop 2001: 283)

I don't know how productive this possibility is in Ambae. What is relevant here is that Ambae *does* have a morphological antipassive, indicated by reduplication of the verb, but this antipassive form is not used in (203).

verbs which describe the same sort of event, (204). In English the patient is a lexical argument of the verb, and possibly the agent as well; as a result, English shows uniform projection, since the lexicalized thematic relations are assigned in both simple clauses and CCs (see chapter 1).

(204) a. Mandarin 'cut': $[\![\textsf{qiē}]\!] = \lambda e.cut(e)$

b. Igbo 'cut': $[\![\textsf{bi}]\!] = \lambda e.cut(e)$

c. English 'cut': $[\![\textsf{cut}]\!] = \lambda x \ldots \lambda e.[cut(e) \ \wedge \ \text{PAT}(e) = x \ldots]$

That verbs with similar meaning may differ in apparent valence is a familiar observation. Discuss and argue describe very similar activities, but only discuss requires a direct object to identify the topic of conversation. What the NAT invites us to assume is just that languages may exhibit *characteristic* differences in how many arguments they assign to a verb lexically, within the range allowed by the number of participants in its event.[17] To me this seems a plausible assumption.[18]

Now let us consider alternative accounts. How might one model the Mandarin and Igbo data while assuming, contra the NAT, that (at least) patients are arguments of the verb? I see three clear possibilities, but I think they all fail as explanations.

First, we could say that each verb has multiple lexical argument structures, but most are permitted only in the M context. Perhaps xǐ 'wash' has several lexical entries, for example, corresponding to the several denotations in (205), but only the entry with denotation (a) occurs freely. The others are constrained to occur only in M.

[17]The NAT itself says nothing about whether languages differ in how many participants in the verb's event must be identified in a simple clause. It says only that languages may differ in how many arguments in a simple clause are lexical arguments of the verb. See section 1.3.2 of chapter 1.

[18]It may be that languages whose verbs characteristically have no arguments have certain other characteristic properties. I don't know what these might be. But that does not make the lack of arguments an implausible characteristic.

(205) ⟦ xǐ 'wash' ⟧ =

a. $\lambda y \lambda x \lambda e.wash(e) \wedge \text{PAT}(e) = y \wedge \text{AG}(e) = x$

b. $\lambda x \lambda e.wash(e) \wedge \text{AG}(e) = x$

c. $\lambda e.wash(e)$

d. $\lambda x \lambda y \lambda e.wash(e) \wedge \text{PAT}(e) = y \wedge \text{AG}(e) = x$

Second, we might keep lexical verbs unambiguous, granting them only those argument structures that are manifested in simple clauses, and locate ambiguity in the complex predicate instead. The same pair of unambiguous verbs in M and R, that is, might yield a complex predicate with several distinct argument structures, (206). These differ in the thematic relations they establish between the means event and the subject or object referents. The object, for example, identifies the patient of washing given (a), the agent of washing given (c), and no participant in the washing given (b).

(206) ⟦ xǐ lèi 'wash tired' ⟧ =

a. $\lambda y \lambda x \lambda e.CAUSE(e, e_1, e_2) \ \wedge \ (wash(e_1) \ \wedge \ \text{PAT}(e_1) = y \ \wedge \ \text{AG}(e_1) = x) \ \wedge \ (tired(e_2) \ \wedge \ \text{PAT}(e_2) = y)$

b. $\lambda y \lambda x \lambda e.CAUSE(e, e_1, e_2) \ \wedge \ (wash(e_1) \ \wedge \ \text{AG}(e_1) = x) \ \wedge \ (tired(e_2) \wedge \ \text{PAT}(e_2) = y)$

c. $\lambda y \lambda x \lambda e.CAUSE(e, e_1, e_2) \ \wedge \ (wash(e_1) \wedge \text{PAT}(e_1) = x \ \wedge \ \text{AG}(e_1) = y) \ \wedge \ (tired(e_2) \ \wedge \ \text{PAT}(e_2) = y)$

The operation of CC predicate formation would then not define a function. More specifically, it would have the effect of arbitrarily permuting or deleting the lexical arguments of the means verb. A version of this solution was developed by Y. Li (1990, 1995), and I proposed what I considered an improvement in Williams 2001.

Finally, formation of a CC predicate might suppress the lexical arguments of the verb in M, through deletion or existential binding. The scheme for interpreting CC predicates might be as in (207), for example, where $\exists z$ binds a presumed lexical argument of M.

(207) $\quad [\![\text{ M R }]\!] = \lambda y \lambda e \exists z \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge [\![\text{M}]\!](z)(e_1) \wedge [\![\text{R}]\!](y)(e_2) \,]$

We would then be free to assume that xǐ 'wash' does have a patient argument lexically, since suppression of this argument under complex predicate formation would ensure that it is assigned to no phrase in the CC clause. Any understood thematic relation to the means event would be regarded as the result of inference, just as proposed within the NAT (see also Sybesma 1999).

This last alternative is the most attractive. It neither multiplies dubious lexical entries nor introduces a nonfunctional operation into the grammar, both moves that should be avoided. But it shares with the other alternatives the same basic problem.

Each alternative proposes that the M context is somehow special. It licenses argument structures not otherwise licit; it allows the verb's lexical arguments to be permuted; or it supresses them altogether. But why should the M context have these effects? More pressingly, why should it have these effects in Igbo and Mandarin but not English? If M's arguments are existentially bound in Mandarin and Igbo, for example, why shouldn't the same be true in English? Unless these questions find a good answer, the descriptive postulates of all three alternatives will seem ad hoc.

I believe there is no good answer, no independent feature of the M context, just in Mandarin and Igbo, that should have any special effect on the argument structure of its occupant. Sometimes changes in valence are linked to changes in aspectuality (e.g. eventive versus stative), or in what event the verb describes (e.g. a spontaneous change versus one wrought by an agent). But it is clear that no such change affects

the means verb in Igbo and Mandarin. Or changes in valence accompany changes in lexical category; Dowty 1989, for example, suggests that verbs lose their arguments under lexical nominalization (cp. Harley and Noyer 2001). But there is no evidence that the lexical category of a root is different in M than in simple clauses. And finally, to repeat, there is no formal indication that passive or antipassive operations apply to the means verb in Mandarin or Igbo.

Only one aspect of CCs in these languages has any allure as an explanatory factor: they, unlike the CCs of English, comprise two verbal heads, rather than a head and a phrase. Yet I will show in section 2.6 that this prospect too is a dead end.

The alternatives are therefore empirical failures. So long as we presume that, in Igbo and Mandarin as in English, patients are arguments of the verb, and maybe agents too, the CC data cannnot be explained. Yet once this presumption is removed, an explanation follows, just from the agreed fact that CCs are complex predicates with the distribution of simple verbs.

2.6 Size does not matter

English allows R to be phrasal, but Igbo and Mandarin do not. For this reason Igbo and Mandarin CCs are described as compounds, and sometimes as compounds formed 'in the lexicon.'[19] If we needed to claim that the M context of Mandarin and Igbo has special effects on argument structure, this difference in syntax might seem to promise an explanation of why. But in fact it could provide no explanation, for three reasons.[20]

First, there is no a priori reason that combining two lexical heads, whether in the

[19]The CCs of English are not compounds, at least not in general. But according to Synder (2001), there is a typological correlation between the availability of CCs in a language, and the availability of compounding. So Snyder suggests that English has CCs *because* it has compounds.

[20]I argue in chapter 4 that the size of R does explain certain patterns in word order.

lexicon or in the syntax, should cause the argument structures of either one to be modified or suppressed. Any such effect would have to be stipulated specially, and on no clear basis.

Second, the required stipulation would conflict with many studies of compounds, which have found it useful to assume that, if a verb has argument structure, it is preserved under compounding. The interpretation of compounds like English god-fearing, for instance, has often been explained by assuming that the root verb (here, fear) maintains its argument structure, and assigns the noun its internal thematic role (see Grimshaw 1990).

Third and most importantly, there is direct evidence from Mandarin that the size of R is not what matters. What accounts for the lack of uniform projection is the formation of a complex predicate, regardless of whether its secondary predicate is a head or a phrase. The evidence comes from another complex predicate type in Mandarin, called the V-*de* construction.

The V-*de* construction consists of a verb, transitive or intransitive, bearing the adverbal enclitic -dé (here glossed 'VDE'), followed possibly by a noun phrase (NP_o) and necessarily by a verb phrase (VP_2), (208). VP_2 is controlled by NP_o when present, and otherwise by the nearest NP outside VP_1.

(208) V-*de* construction: $[_{VP_1}$V-dé (NP_o) VP_2]

There are two or three subtypes of V-*de* construction, differing (at least) in what semantic relation holds between the meanings of V and VP_2 (L. Li 1963, Huang 1988, Lamarre 2001, Yue 2001). In one the meaning is roughly causative, and here glossing -dé as 'such that' yields an appropriate paraphrase.

(209) tā hǎn -dé wǒmén dōu lùoxià -le yǎnlèi.
3s scream -VDE we all fall -PFV tear
'S/he screamed such that we all shed tears.' (L. Li 1963: 405, tr. AW)

Two major studies of the V-*de* construction are L. Li 1963 and Huang 1992. Both conclude that V and VP_2 form a complex predicate to the exclusion NP_o. V combines first with VP_2 and then the result combines with NP_o.[21] Underlyingly, therefore, the V-*de* construction is isomorphic to the verb-verb CC. Both are complex predicates; they differ just in the size of their secondary predicates.

The NAT therefore predicts that, in V-*de* constructions as in a CCs, a verb will not be subject to the cooccurrence requirements it is subject to in simple clauses. And this is correct. Compare (210) and (211). In the simple clause (210), kuā 'praise' must cooccur with a patient, but in the V-*de* construction (211), it need not.

(210) * wǒ kuā -le.
1s praise -PFV
Intended: 'I praised.' (Can mean: 'I praised *him/her*.')

(211) wǒ pāi Lǎo Wèi -dé mǎ pì, kuā -dé lián ta tàitài
1s smack Lao Wei -VDE horse rump, praise -DE even 3s wife
yě bùhǎoyìsǐ le.
also embarrassed PRT
'Flattering Lao Wei, I praised [him] such that even his wife got embarrassed.'

(211) cannot be analyzed as containing a silent pronoun, serving as the object of kuā and referring to the understood recipient of praise. Syntactically there is no space for such a pronoun, either before the verb or after, (212).

[21] For Huang (1992) the surface discontinuity of the predicate is an effect of verb-raising, which here applies to V alone. I assume the same; see chapter 4. Huang also regards what I label VP_2 as a clause whose subject is a silent anaphor, controlled by the nearest noun phrase.

(212) * wǒ pāi Lǎo Wèi -dé mǎpì, (tā) kuā (tā) -dé (tā) lián
1s smack L.W.'s horse rump, (him) praise (him) -VDE (him) even
tā tàitài yě bùhǎoyìsi le.
his wife also embarrassed PRT
Intended: Same meaning as (211).

We also find that, again, notional thematic relata may be found in unusual syntactic positions, as in (213).

(213) wāndòu chī -dé rén tǔi fā ruǎn.
peas eat -VDE people legs go soft
'Peas make people go weak in the knees from eating them.'
(L. Li 1963: 405, quoting Liu Ke)

Here the understood patient of eating, wāndòu 'peas,' is the subject of the clause, and the understood agent is the object, rén 'people'. This arrangement is not possible in simple clauses, (214).

(214) * wāndòu chī rén.
peas eat people
Intended: 'People eat peas.'

One can plausibly object that wāndòu 'peas' in (213) is a topic, whose thematic relation to chī 'eat' is only inferred and not assigned grammatically. But in that case chī 'eat' enters no patient relation in (213), and this is itself significant, since in simple clauses the patient relation is required, (215).

(215) * Lǎo Wèi chī -le.
L.W. eat -PFV
Intended: 'Lao Wei ate.' (Can mean: 'Lao Wei ate *it*.')

The fact that Mandarin verbs seem to lose their arguments in verb-verb CCs is thus part of a larger pattern. Their arguments seem to get lost in any complex predicate, whether its secondary predicate is a single verb or a phrase. One cannot

use the size of R to explain the lack of uniform projection in Mandarin, therefore, without missing a major generalization.

Given this, I will assume that the size of R cannot explain why Igbo verbs do not show uniform projection either, or why English verbs do. This seems to be the null hypothesis.

One very common idea about why Mandarin (or Igbo) differs from English is consequently upended. The reason Mandarin lacks the UPP but English has it is not that Mandarin CCs are 'lexical' (comprising two verb roots) while English CCs are 'syntactic' (comprising a verb and a phrase). It is rather that the introduction of thematic relations is lexical in English, and syntactic in Mandarin.

2.7 Meaning and the distribution of patients

In Igbo and Mandarin, a verb whose patient is always identified in simple clauses can nevertheless occur in a CC where no noun phrase names its patient. I have concluded that these verbs do not have a lexical requirement for a patient, and therefore that they do not 'project' the structure of the simple clauses they occur in. It is not because Mandarin qiē 'cut' and Igbo bi have a lexical requirement for a patient, for example, that (216) and (218) are grammatical, but (217) and (219) are not.

(216) Lǎo Wèi qiē -le zhúsǔn.
L.W. cut -PFV bamboo shoot
'Lao Wei cut bamboo shoots.'

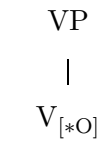
(217) * Lǎo Wèi qiē -le.
L.W. cut -PFV
Intended: 'There was an event of cutting with Lao Wei its agent.'
Can mean: 'Lao Wei cut *it*.'

(218) O bi -ri osisi.
3sS cut -FACT wood
'S/he cut wood.'

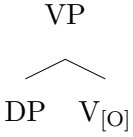
(219) * O bi -ri (ebi).
3sS cut -FACT (BVC)
Intended: 'There was an event of cutting with him its agent.'

Of course our nonprojectionist grammar is not without a way of encoding these facts.[22] For instance, we can assign a feature [O] to all verbs that, in simple clauses, only occur in VPs with a direct object. Then we can ensure that such verbs never occur in a VP without a direct object by assuming rules of phrase structure like (220) and (221). Here [∗O] means that a V in this slot cannot have the feature [O].[23]

(220)



(221)



If these are the only rules for VP, the grammar has this consequence: any predicate which combines with a DP to make a VP must have [O], and any predicate which can be a VP on its own must not. Since VPs with a DP daughter—a direct object—introduce a patient relation, this means that any predicate which has the patient of its event identified by a direct object will have [O].

The grammar does not say, however, that an *individual verb root* with [O] will necessarily have the patient of its event identified. A verb V may occur inside a

[22]There is never a question of whether the distribution of a verb *can* be encoded in a grammar where phrase structure does not project from the verb. What matters is how it's done, and which of the possible encodings is regarded as more plausible or explanatory on independent linguistic grounds. See Joshi and Schabes 1997.

[23]It might be possible to recast this grammar with V in (221) not specified for [O] at all. This would require only minor adjustments to what I say here.

complex predicate [V X]. And if the complex predicate combines with a direct object, the patient the object identifies will belong to the event of [V X], which is not (or may not be) the event of V itself.

Suppose that Mandarin qiē 'cut' has [O], for example. Then any VP whose predicate comprises just the verb qiē 'cut' will have a direct object, and hence in any simple clause with qiē 'cut' the patient of cutting will be identified. Not so if qiē occurs in a complex causative predicate, like qiē dùn 'cut dull.' With this complex predicate in the V slot of (221), the direct object will identify the patient of causation, not the patient of cutting; on this the [O] feature in M has no influence.

Assigning a verb [O], therefore, does not mean assigning it a patient as a lexical argument, since a verb with [O] is not thereby constrained to occur only in contexts that identify its patient.

This does not make [O] an unmotivated diacritic. Ideally, we want subcategorial features like [O] to reflect some feature of their bearer's meaning. The idea is, anything with [O] describes a certain sort of event, and that is why the grammar introduces patients only in relation to predicates with [O]. Fine. Let us suppose, at least for the sake of argument, a very simple criterion for the assignment of [O]. It is assigned to all and only those roots whose event has a patient. On this basis we assign [O] to verbs meaning 'cut.' We should also assign [O] to the CAUSE head, under the presumption that any *CAUSE* event has a patient. A *CAUSE* event is one where something enters the result condition defined by R because of the M event; and this thing is the patient of causation. Given rules (220) and (221), the facts of Mandarin and Igbo then follow. Any simple clause with qiē 'cut' or bi 'cut' has a direct object identifying the patient of cutting, and any CC has a direct object constrained to identify the patient of causation, though not the patient of M. More gratifyingly, the grammar captures an explanatory generalization that relates distribution to meaning.

If the maximal predicate in a VP describes an event that has a patient, its patient is identified by a direct object DP.

So the nonprojectionist grammar does not differ from its projectionist alternatives in being able to express such generalizations. Where it does differ is in their domain. A nonprojectionst model introduces a thematic relation θ in the syntactic context, in relation to a predicate whose complexity is not restricted by any architectural premise of the model. Principles that relate the occurrence of θ to predicate meaning are therefore stated over predicates of arbitrary size. And consequently we can say that a maximal VP predicate whose event has a patient must have its patient identified, without also saying the same for each individual verb root whose event has a patient. This is not possible under a projectionist model. If θ is introduced in the lexical representations of individual verb roots, then a principle regulating the distribution of θ will apply to each verb root in the lexicon. (If it didn't, it would hardly express a valid generalization.) And consequently, any verbal root whose event has a patient will be associated with a requirement to have its patient identified; that is, it will be assigned a patient as a lexical argument.

With this understood, the issue in section 1.3.2 of chapter 1 is more brightly illuminated. There I mentioned the idea that there ought to be a trivial correspondence between lexical meaning and lexical valence: if a verb's event has a certain participant necessarily, then it ought to have that participant as a lexical argument. Now it is clear exactly how this is misguided. Everybody wants to discover simple correspondences between the distribution of thematic relata and the meanings of predicates they relate to. But there is no reason to presume that these correspondences must be stated over lexical items only, because there is no reason to presume that thematic relations are introduced only in the representation of lexical items. Thus the position that lexical valence should follow directly from lexical meaning simply *presupposes*

a projectionist framework. And consequently it cannot be used to argue against its alternative.

I don't know whether the suggested criterion for the assignment of [O] is correct, or if something finer is needed. I leave that question for future work. The point here, which bears repeating, is this. Assigning a verb [O] does not mean assigning it a patient as a lexical argument, even if [O] is assigned because the event of the verb has a patient. And thus it can neither be said that, in using [O], the NAT becomes equivalent to its projectionist alternatives, nor that it forsakes the goal of relating the distribution of arguments to the meanings of the predicates they relate to.

In section 3.3 of chapter 3 I will discuss the distribution of *agent* arguments, where we'll see the patterns are more subtle.[24]

[24]In Igbo, there is another way in which verbs behave differently in CCs than they do in simple clauses, pointed out in Lord 1975. Many Igbo verbs occur with one or another "Inherent Complement," or IC (Nwachukwu 1987). ICs are typically bare nouns. The combination of a verb and an IC describes a more specific type of event than the verb alone. But in general, that meaning cannot be determined trivially, given just the meanings of the verb and the noun alone; the combination is idiomatic. In (222), ti 'hit' has the IC okpo 'blow.'

(222) O ti -ri nwoke ahụ okpo.
3s strike -FACT man that blow
'S/he struck that man a blow.'

Here the IC specifies that the striking event consisted of a punch, thrown by one person at another. Without this IC, it would be assumed that the strike was delivered by an involuntary collision, as in (223). (The verb bears the 'open vowel suffix,' because it occupies a noninitial VP in what is sometimes called the serial VP construction.)

(223) Osisi da -ra ti -e nwoke ahụ.
wood fall -FACT strike -OVS man that
'The tree fell, striking that man.'

ICs do not occur in complex causatives (Lord 1975: 32, et seq.). A verb which occurs with a noun N as an IC in a simple clause will not occur with N as an IC when in a complex causative, (224). If N occurs in the CC at all, it will be within a PP adjunct.

(224) O ti da -ra nwoke ahụ (*okpo).
3s strike fall -FACT man that blow
'She/he/it made that man fall by striking.'

2.8 Conclusions

The grammar of CCs in Igbo and Mandarin is explained directly if patients and agents in these languages are not lexical arguments of the verb. The explanation is attractive because it does not require any special operations on argument structure that apply in Mandarin and Igbo only. There is no independent indication that such operations do apply, and if they were to be postulated, it would be hard to say why they don't apply in English CCs as well. By adopting the NAT, therefore, we not only simplify the theory of Igbo and Mandarin, but also afford ourselves an account of CC structure that is cross-linguistically more uniform. The source of the observed variation is relocated to the lexicon; or, more precisely, to differences in whether a certain argument type is introduced by the verb or by the structure it occurs in.

These conclusions imply three points of more general relevance. First, we need to distinguish between what sort of event a verb describes, and what combinatory requirements are associated with the verb lexically. A verb need not have as many lexical arguments as its event has thematic participants. The idea that it should has guided much research, both grammatical and psycholinguistic. But if I am right,

Absent the IC, there is of course no assertion that the means event is of the type specified by the verb-IC combination. But neither is there any implication that it isn't of that type—not when the absence is grammatically mandated, rather than freely chosen. So one can take (224) to describe a situation where a punch is thrown, or one where the subject referent collides with the man involuntarily.

Seen from my perspective, this fact has three related implications for the analysis of ICs. First, if an IC is not needed in the complex causative context, its presence in simple clauses must not express a lexical requirement of the verb. Even if the verb always occurs with one or another IC in simple clauses, this must express conditions associated with the structure(s) in which V_o's occur. Second, the combination of a verb and an IC forms a $\overline{V}$ (pace Nwachukwu 1987). It then follows that M cannot itself contain an IC, since M is constrained to be a V_o simply. And furthermore, if an IC were generated outside of M, as the sister to the complex verb M-R, it would be licensed and interpreted in relation to that whole predicate, not the means verb individually. So there is no way to generate an IC particularly for the verb in M. Third, given that ICs are not lexically required, and yet the semantic contribution of an IC is sometimes idiomatic, it must be possible to state idiomatic meanings over structures assembled in syntax; see Marantz 1997.

For different perspectives on ICs and the relevance of their absence from complex causatives, see Nwachukwu 1987, Manfredi 1991, Ihiọnụ, Déchaine 1993, and Stewart 2001 (pp. 153–154).

there is empirical evidence against it.

Second, recognizing the distinction between lexical meaning and lexical valence does not mean forgoing any theory of how the distribution of arguments relates to event type. It just means that principles governing this relation apply where the thematic relations are introduced. If they are introduced lexically, we will see a strict correlation between the presence of arguments and the meanings of individual verbs. But if they are introduced in syntax, the generalizations may refer to the event of a predicate larger than a single lexical item.

And third, inasmuch as it simplifies description of the distributional facts, we need to include *patient* in the inventory of basic thematic predicates.

There is much doubt about the semantic legitimacy of a generalized patient (or theme) relation. Even more so than agents, the presumed patients of distinct event-types share few distinguishing properties (Parsons 1990, Dowty 1991). It is hard to say what the putative patients of all possible event types have in common. As Kratzer 2003 observes, we generally cannot recognize the patient of an event—that is, of an actual happening in the world—except under a particular description of the event imposed by a verb. Suppose that Bob criticizes Al's work poignantly, and in doing so, seduces his wife. Then as the criticism proceeds, and with it the seduction, it is impossible to say who is the patient of *what is happening*, Al's work or his wife. We can decide this only once we regard what is happening qua criticism, or qua seduction. So, if what happened is just one and the same *event*, and events are the things to which one bears thematic relations, it is not clear that a general patient predicate could be given truth conditions of any substance.[25]

[25]Kratzer refines this observation by demonstrating that the patient relation is not "cumulative." For a thematic relation R, being cumulative means this: whenever x bears R to e_1, and y bears R to e_2, the sum of x and y bears R to the sum of e_1 and e_2. The agent relation is cumulative, Kratzer shows, but the typical patient relation seems not to be, since we can reason like this. Suppose that, by criticizing his work and seducing his wife, Bob humiliates Al. Here the patient of humiliation is

Putting it differently, if there is such a predicate, it will require that events are individuated to a fine grain. What happens in the story of Bob and Al is not one event, but several. If events are the domain for our thematic relations, then the criticism and the seduction are not the same event, even though they coincide in the same piece of history. Given this, a patient relation can be defined (compare Parsons 1990 and Landman 2000 on agents). But, as observed in chapter 1, the requisite degree of finegrainedness compromises a motivating ambition in semantic theory: we want to relate language to a denotational domain of significantly independent structure. And for this reason, the idea of a basic predicate that denotes a generalized patient relation is often considered suspect.

With this work I mean only to cast an opposing doubt, based on the distributional facts of Igbo and Mandarin. In these languages patient arguments seem to be introduced syntactically, and not only in a small group of special cases. If introducing an argument syntactically means introducing a thematic predicate into the semantic derivation, as I assume (see section 1.5.1 of chapter 1), then the grammars of Igbo and Mandarin do include *patient* as a basic predicate. And if this is correct, then perhaps our semantic ambition should be moderated. With Landman (2000), we might accept that a denotational domain of fine-grained events is linguistically necessary, but proceed to relate this domain to one of coarser-grained "situations," by construing events a properties of situations. See also the discussion in Pietroski 2004.

Al, not his work and his wife. Yet the event of humiliation would seem to *consist* of the criticism and seduction. If that is right, then the patient of the sum event does not comprise the patients of the summed events, and the patient relation is not cumulative. For Kratzer, this eliminates the general patient relation from the class of "denotations of simple predicates in natural language," which she proposes are necessarily cumulative.

2.9 Back to English CCs

Before leaving this chapter, I return to English to address two outstanding issues. In 2.9.1 I show how English CCs will be derived, given that English verbs have patients as lexical arguments, and maybe agents as well. The discussion here lays the groundwork for observations in chapter 3, concerning control of R, and concerning the distribution of agents. In 2.9.2 I sweep out the closet of apparent exceptions to the UPP. The latter subsection can be skipped by anyone wanting to keep the thread of the cross-linguistic discussion.

2.9.1 The derivation of CCs in English

I suggested that, in English, a verb that occurs with a patient in simple clauses typically has the patient as a lexical argument. I implemented this by having the verb denote a function over a patient. Suppose that English adjectives like flat also denote a function over their patient, as in (225).[26]

(225) $\llbracket \text{ flat } \rrbracket = \lambda y \lambda e.[\mathit{flat}(e) \ \wedge \ \text{PAT}(e) = y]$

Then for English, control of R can be derived just by letting the presumed lexical argument of R apply to a DP in the clause. It is not necessary to postulate, in the semantic representation of CCs, a patient relation to the event of causation, as I have done for Igbo and Mandarin.

An example derivation will demonstrate this. Assume that pound denotes as in (226), and that CAUSE denotes as in (227), introducing no more than the *CAUSE*

[26] I have been assuming that, for verbs, semantic type represents argument requirements. Assigning a verb type $\langle e, t\rangle$ entails assigning a lexical requirement to cooccur with an argument phrase of type $\langle e\rangle$, and assign it a thematic relation. Recall, however, that I do not assume the same for adjectives, like flat. Even if flat denotes in type $\langle e, \ldots\rangle$, this does not mean that it has a need to assign its role to an $\langle e\rangle$-argument. If it did, it would be impossible in the very flat cutlet, which contains no expression of type $\langle e\rangle$.

event. The denotation of CAUSE here also incorporates abstraction over the presumed internal arguments of M and R, which are thereby unified. This could be done in the semantic rules instead; see section 1.5 of chapter 1, and the derivations at the end of this section.

(226) $[\![\textsf{pound}]\!] = \lambda y \lambda e.[pound(e) \ \wedge \ \mathrm{PAT}(e) = y]$

(227) $[\![\textsc{cause}]\!] =$
$\lambda R \lambda M \lambda y \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \ \wedge \ M(y)(e_1) \ \wedge \ R(y)(e_2)]$

The CC predicate pound flat then denotes as in (228), and adding the direct object, the cutlet, gives (229).

(228) $[\![\textsf{pound} \ \textsc{cause} \ \textsf{flat}]\!] = \lambda y \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \ \wedge \ pound(e_1) \ \wedge$
$\mathrm{PAT}(e_1) = y \ \wedge \ flat(e_2) \ \wedge \ \mathrm{PAT}(e_2) = y \ ]$

(229) $[\![[_{\mathrm{VP}} \ \textsf{the cutlet} \ [_{\overline{\mathrm{V}}} \ \textsf{pound} \ \textsc{cause} \ \textsf{flat} \ ]]\!] = \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \ \wedge$
$pound(e_1) \ \wedge \ \mathrm{PAT}(e_1) = c \ \wedge \ flat(e_2) \ \wedge \ \mathrm{PAT}(e_2) = c \ ]$

(229) says that the cutlet, c, is flat. So control of flat by the cutlet is derived without reference to a patient of causation.

Postulating a patient of causation would, however, permit a description of the core semantic structure of the CC construction that is uniform across languages. The semantics of a CC predicate would then vary only in the contributions of its variable constituents, the M and R predicates. In every language, the semantics of the CC would have the outline in (230) (here ignoring the effects of operations that unify various arguments, when present). The agent relation is optional, as we will see in the next chapter.

(230) Semantic structure for any complex causative clause:
$\exists e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \ \wedge \ M(e_1) \ \wedge \ R(e_2) \ \wedge \ \mathrm{PAT}(e) = [\![\mathrm{Object}]\!]$
$(\wedge \ \mathrm{AG}(e) = [\![\mathrm{Subject}]\!]) \ ]$

This might allow the direct statement of cross-linguistic generalizations that could otherwise be stated only indirectly. Possible generalizations of this sort will come up in chapter 3. So let us implement this idea, in case it should prove useful.

Since we have no clear evidence that patient relations are introduced structurally in English, l will assume that the patient relation is introduced lexically in the denotation of the CAUSE head. Thus (231) replaces (227).

(231) $[\![\text{CAUSE}]\!] = \lambda R \lambda M \lambda y \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge M(y)(e_1) \wedge R(y)(e_2) \wedge \text{PAT}(e) = y \,]$

Now English CAUSE introduces both the *CAUSE* event and a patient for it. The internal arguments of M and R are unified, as before, but they are also unified with the argument naming the patient of causation. (Again, this operation could be factored out of the denotation; see below.) Instead of (229), then, we will have (232).

(232) $[\![\, [_{\text{VP}} \text{ the cutlet } [_{\overline{\text{V}}} \text{ pound CAUSE flat }]] \,]\!] = \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge \text{PAT}(e) = c \wedge \textit{pound}(e_1) \wedge \text{PAT}(e_1) = c \wedge \textit{flat}(e_2) \wedge \text{PAT}(e_2) = c \,]$

This says that the cutlet is both the patient of the *CAUSE* event and the patient of its result event. Since the former property entails the latter, this is redundant. Redundancy is never attractive on its own. But if it allows the clear statement of important generalizations, it may be worth accepting.

When I need to distinguish them, I will call the theory of English CCs that assumes (227) the *simple* analysis, and the theory that assumes (231) the *causee* analysis.

I will assume that, in English as in Mandarin, the complex causative VP combines with v_{AG}, the head that introduces an agent relation. Then we have a vP as in (233).

(233) $[\![\, [_{v\text{P}} \text{ Al } [_{\overline{v}} \, v_{\text{AG}} \, [_{\text{VP}} \text{ the cutlet } [_{\overline{\text{V}}} \text{ pound CAUSE flat }]]]] \,]\!]$
$= \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge \textit{pound}(e_1) \wedge \text{PAT}(e_1) = c \wedge \textit{flat}(e_2) \wedge \text{PAT}(e_2) = c \wedge \text{PAT}(e) = c \wedge \text{AG}(e) = a \,]$

This says that Al is the agent of causation. But it does not say that he is the agent of pounding. So it leave something important unaccounted for. In English, unlike in Mandarin, the subject of a (transitive) CC identifies the agent of M, necessarily.

To account for this, one might assume that English imposes the inference scheme in (234).

(234) Agent of causation inference

If x is the agent of e, and $CAUSE(e, e_m, e_r)$, then x is the agent of e_m.

Yet this is not very satisfying, since (234) cannot be justified as a necessary semantic postulate. As we have seen, it does not hold in Mandarin; the agent of causation is not always the agent of the means event.

The alternative is to presume that English verbs have agents as lexical arguments. Then pound denotes as in (235).

(235) $[\![\text{ pound }]\!] = \lambda y \lambda x \lambda e.[\ \textit{pound} \wedge \text{PAT}(e) = y \wedge \text{AG}(e) = x\ ]$

Presuming that this argument is inherited by the complex predicate, pound flat, we will ensure that the subject identifies the patient of pounding.

Again, the inheritance can be effected in the denotation of CAUSE, if it denotes as in (236). Then vP has the analysis in (237), directly capturing the fact that Al is the agent of pounding—while also saying that he is the agent of causation.

(236) $[\![\text{ CAUSE }]\!]$

$= \lambda R \lambda M \lambda y \lambda x.[CAUSE(e, e_1, e_2)\ \wedge\ M(y)(x)(e_1)\ \wedge\ R(y)(e_2)\ \text{PAT}(e) = y\ ]$

(237) $[\![\ [_{v\text{P}}$ Al $[_{\overline{\text{v}}}\ v_{\text{AG}}\ [_{\text{VP}}$ the cutlet $[_{\overline{\text{V}}}$ pound CAUSE flat $]]]]\ ]\!]$

$= \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2)\ \wedge\ \textit{pound}(e_1)\ \wedge\ \text{PAT}(e_1) = c\ \wedge\ \text{AG}(e_1) =$

$a\ \wedge\ \textit{flat}(e_2)\ \wedge\ \text{PAT}(e_2) = c\ \wedge\ \text{PAT}(e) = c\ \wedge\ \text{AG}(e) = a\ ]$

Or the inheritance and unification of arguments can be implemented in the semantic rules, thus allowing CAUSE to remain simple, with either (239) or (238) as its denotation.

(238) $[\![\text{ CAUSE }]\!] = \lambda R \lambda M.[CAUSE(e, e_1, e_2) \ \wedge \ M(e_1) \ \wedge \ R(e_2) \ ]$

(239) $[\![\text{ CAUSE }]\!] = \lambda R \lambda M \lambda y.[CAUSE(e, e_1, e_2) \ \wedge \ M(e_1) \ \wedge \ R(e_2)$
$\wedge \ \text{PAT}(e) = y \ ]$

Let '$\bullet$' stand for Function Application, such that $A \bullet B = A(B)$. And let $\overset{\circ}{+}_v$ stand for Kratzer's Event Identification. The operators $\circ$, $\overset{+}{\circ}$, $\overset{+}{\circledcirc}$, and $\overset{+_v}{+}_e$ have the values defined in section 1.5 of chapter 1. Given (239), the vP in (240) is derived as in (241), if pound has only a patient as a lexical argument. If it has an agent argument as well, (240) is derived as in (242).

(240) $[\![\ [_{v\text{P}} \ [_{\text{DP}} \ \textsf{Al} \ ] \ [_{\overline{\text{v}}} \ [v_{\text{AG}} \ [_{\text{VP}} \ [_{\text{DP}} \ \textsf{the cutlet} \ ] \ [_{\overline{\text{V}}} \ \textsf{pound} \ \text{CAUSE} \ \textsf{flat} \ ] \ ] \ ] \ ] \ ]\!]$

(241) $((\ [\![v_{\text{AG}}]\!] \ \overset{\circ}{+}_v \ ((([\![\text{CAUSE}]\!] \ \overset{+}{\circ} \ [\![\textsf{flat}]\!]) \ \overset{+}{\circ} \ [\![\textsf{pound}]\!]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

(242) $((\ [\![v_{\text{AG}}]\!] \ \overset{+_v}{+}_e \ ((([\![\text{CAUSE}]\!] \ \overset{+}{\circ} \ [\![\textsf{flat}]\!]) \ \overset{+}{\circledcirc} \ [\![\textsf{pound}]\!]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

Presuming (238) instead, (243) replaces (241) and (242) with (243) and (244).

(243) $((\ [\![v_{\text{AG}}]\!] \ \overset{\circ}{+}_v \ ((([\![\text{CAUSE}]\!] \circ [\![\textsf{flat}]\!]) \ \overset{+}{\circ} \ [\![\textsf{pound}]\!]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

(244) $((\ [\![v_{\text{AG}}]\!] \ \overset{+_v}{+}_e \ ((([\![\text{CAUSE}]\!] \circ [\![\textsf{flat}]\!]) \ \overset{+}{\circledcirc} \ [\![\textsf{pound}]\!]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!]) \ .$

(245) shows the further calculation of (242), the most complex case. The others can be cashed out similarly.

(245) $(([\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} ((([\![\textsc{cause}]\!] \overset{+}{\circ} [\![\textsf{flat}]\!]) \overset{+}{\circledcirc} [\![\textsf{pound}]\!]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

a. Calculating $[\![\textsc{cause}]\!] \overset{+}{\circ} \textsf{flat}$

i. $= (([\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} (((\lambda y.[\lambda y_c \lambda R \lambda M \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \wedge M(e_1) \wedge R(e_2) \ \wedge \ \mathrm{PAT}(e) = y_c \ ](y)(\lambda y_r \lambda e.[\ \textit{flat}(e) \ \wedge \ \mathrm{PAT}(e) = y_r \ ])(y))]) \overset{+}{\circledcirc} [\![\textsf{pound}]\!]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

ii. $= (([\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} (((\lambda y \lambda M \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \wedge M(e_1) \wedge \textit{flat}(e_2) \wedge \mathrm{PAT}(e) = y \ \wedge \ \mathrm{PAT}(e) = y \ ]) \overset{+}{\circledcirc} [\![\textsf{pound}]\!]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

b. Calculating $[\![\textsc{cause}\ \textsf{flat}]\!] \overset{+}{\circledcirc} [\![\textsf{pound}]\!]$

i. $= (([\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} ((\lambda y \lambda x [\lambda y_{cr} \lambda M \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \wedge M(e_1) \wedge \textit{flat}(e_2) \ \wedge \ \mathrm{PAT}(e_2) = y_{cr} \ ](y)(\lambda y_m \lambda x_m \lambda e.[\ \textit{pound}(e) \ \wedge \ \mathrm{PAT}(e) = y_m \ \wedge \ \mathrm{AG}(e) = x_m \ ](y)(x))]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

ii. $= (([\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} ((\lambda y \lambda x \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \ \wedge \ \textit{pound}(e_1) \ \wedge \ \mathrm{PAT}(e_1) = y \wedge \mathrm{AG}(e_1) = x \wedge \textit{flat}(e_2) \wedge \mathrm{PAT}(e_2) = y \wedge \mathrm{PAT}(e) = y \ ]) \bullet [\![\textsf{the cutlet}]\!])) \bullet [\![\textsf{Al}]\!])$

c. Calculating $[\![\textsf{pound}\ \textsc{cause}\ \textsf{flat}]\!] \bullet [\![\textsf{the cutlet}]\!]$

i. $= (([\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} (\lambda y \lambda x \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \wedge \textit{pound}(e) \wedge \mathrm{PAT}(e) = y \ \wedge \ \mathrm{AG}(e) = x \ \wedge \ \textit{flat}(e_2) \ \wedge \ \mathrm{PAT}(e_2) = y \ \wedge \ \mathrm{PAT}(e) = y \ ] \bullet c)) \bullet [\![\textsf{Al}]\!])$

ii. $= (([\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} (\lambda x \lambda e \exists e_1 \exists e_2.[CAUSE(e, e_1, e_2) \wedge \textit{pound}(e) \wedge \mathrm{PAT}(e_1) = c \ \wedge \ \mathrm{AG}(e_1) = x \ \wedge \ \textit{flat}(e_2) \ \wedge \ \mathrm{PAT}(e_2) = c \ \wedge \ \mathrm{PAT}(e) = c \ ])) \bullet [\![\textsf{Al}]\!])$

d. Calculating $[\![v_{\mathrm{AG}}]\!] \overset{+_v}{+_e} [\![\textsf{the cutlet pound CAUSE flat}]\!]$

i. $= ((\ \lambda x \lambda e.[(\lambda x_a \lambda e_a.\mathrm{AG}(e) = x_a)(x)(e) \wedge (\lambda x_m \lambda e_c \exists e_1 \exists e_2.[\mathit{CAUSE}(e_c, e_1, e_2) \wedge \mathit{pound}(e_1) \wedge \mathrm{PAT}(e_1) = c \wedge \mathrm{AG}(e_1) = x_m \wedge \mathit{flat}(e_2) \wedge \mathrm{PAT}(e_2) = c \wedge \mathrm{PAT}(e_c) = c]])(x)(e)]\ ) \bullet [\![\textsf{Al}]\!])$

ii. $= ((\lambda x \lambda e.[\mathrm{AG}(e) = x \wedge \exists e_1 \exists e_2.[\mathit{CAUSE}(e, e_1, e_2) \wedge \mathit{pound}(e_1) \wedge \mathrm{PAT}(e_1) = c \wedge \mathrm{AG}(e_1) = x \wedge \mathit{flat}(e_2) \wedge \mathrm{PAT}(e_2) = c \wedge \mathrm{PAT}(e) = c\ ]]) \bullet [\![\textsf{Al}]\!])$

e. Calculating $[\![v_{\mathrm{AG}}\ \textsf{the cutlet pound CAUSE flat}]\!] \bullet [\![\textsf{Al}]\!]$

i. $= \lambda x \lambda e.[\mathrm{AG}(e) = x \wedge \exists e_1 \exists e_2.[\mathit{CAUSE}(e, e_1, e_2) \wedge \mathit{pound}(e_1) \wedge \mathrm{PAT}(e_1) = c \wedge \mathrm{AG}(e_1) = x \wedge \mathit{flat}(e_2) \wedge \mathrm{PAT}(e_2) = c \wedge \mathrm{PAT}(e) = c\ ]](a)$

ii. $= \lambda e.[\mathrm{AG}(e) = a \wedge \exists e_1 \exists e_2.[\mathit{CAUSE}(e, e_1, e_2) \wedge \mathit{pound}(e_1) \wedge \mathrm{PAT}(e_1) = c \wedge \mathrm{AG}(e_1) = a \wedge \mathit{flat}(e_2) \wedge \mathrm{PAT}(e_2) = c \wedge \mathrm{PAT}(e) = c\ ]]$

2.9.2 Apparent exceptions to the UPP in English

In English one does sometimes find what look like exceptions to the UPP. (246) gives a survey. In each of these, a verb V occurs in what might be seen as a CC, and the thematic relation between the direct object and the V event is not what it would be in a simple clause with V.

(246) a. Al slashed his way through the dense bush.

b. Al washed the soap out of his eyes.

c. Bernie fried the pan black. (*sic*, Boas 2003: 113)

d. "[H]ard-liners ... argued than an all-out arms race would spend the Soviet Union into bankruptcy ..." (T. Powers, 'Tomorrow the World,' *New York Review of Books*, 11 March 2004)

It is not Al's way that is slashed (246a), the soap that is washed (246b), or the Soviet Union that is spent (246d). And perhaps (though this is not obvious) it is not the pan that is fried (246c), for those who accept this sentence.

I believe that these seeming exceptions are of little consequence. (246a) and (246b), we will see, are not CCs at all, and are therefore irrelevant (Goldberg 1995, Levin and Rappaport Hovav 1995). (246c) and (246d) evidently have the structure of CCs, but the force of their challenge is not clear. To the extent that (246c) is acceptable at all, its acceptability actually does depend on regarding the pan as the patient of frying, and so the sentence is not as exceptional as it seems. (246d), on the other hand, is anomalous without question; but in this case it is plausible to dismiss the sentence as instantiating an idiomatic collocation.

The *way*-construction

(247) and (248) are examples of the *way*-construction (Jackendoff 1990: 212–223, Marantz 1992, Goldberg 1995: ch. 9). The construction has the form in (249), where X is a pronoun anaphoric to the subject, and PP denotes a path.

(247) Al slashed his way through the dense bush.

(248) Al braised his way into the pantheon of slow-cooking chefs.

(249) *Way*-construction: Subject$_i$ V X_i's way PP

Semantically, the construction says that the referent of the subject traverses the path of the PP, and at the same time performs the action of the verb. In the usual case (Goldberg 1995: 202), the action of the verb is also understood as the means by which traversal of the path is accomplished. Thus (247) says that Al made his way through the bush by slashing, and (248) that Al made his way into the pantheon by braising.

Due to these similarities in form and meaning, it may seem that the so-called *way*-construction is just a complex causative with a certain kind of direct object (Marantz 1992). And if this were true, it would introduce a class of exceptions to the UPP, since normally transitive verbs occur freely in the *way*-construction without a logical object. (247) does not say what Al slashed, or (248) what he braised, yet these are verbs that normally require their patient in simple clauses, (250,251).

(250) Al slashed ?*(the dense bush).

(251) Al braised *(a pork shoulder).

One might take this fact itself as evidence that the *way*-construction is not a type of CC (Goldberg 1995: 217). But current purposes require further evidence, independent of the question we are asking. Such evidence is available in the facts of adverb distribution.

In what are uncontroversially CCs, an adverb that intervenes between the direct object R cannot describe the means event, or the event of causation as a whole. The only available construal is with R. For this reason the sentences in (252–254) are unacceptable. It would be sensible to construe the adverb with M, or the whole CC, but the grammar forbids this. Modification of R is allowed, but this results in nonsense.

(252) # Al pounded the cutlet masterfully flat.
Contrast: Al (masterfully) pounded the cutlet flat (masterfully).

(253) # Al wiped the tabletops frantically dry.
Contrast: Al (frantically) wiped the tabletops dry (frantically).

(254) # Al kicked the gate ferociously open.
Contrast: Al (ferociously) kicked the gate open (ferociously).

This is true even when R is a PP (255), even a PP that describes a path of motion, (256).

(255) # Al beat the intruder frantically to death.
Contrast: Al (frantically) beat the intruder to death (frantically).

(256) # Al hammered the nail expertly into the wood
Contrast: Al (expertly) hammered the nail into the wood (expertly).

Adverbs in the *way*-construction behave differently. It is possible to have a manner adverb after the direct object and before the path PP (Jackendoff 1990: 212). But in this position the adverb need not, and generally cannot, be construed as modifying the path PP. This construal would be unreasonable for the adverbs in (257) and (258), for example.

(257) Al slashed his way masterfully through the dense bush.

(258) Al smiled his way confidently past the velvet ropes.

It is not Al's path through the bush that is masterful, or his path past the ropes that is confident. What the adverbs describe seems rather to be the event described by the entire complex predicate. (257) tells us how Al slashed his way through the bush, and (258) how he smiled his way past the ropes.

It may seem that the adverbs describe the action of the main verb, slashing or smiling. But the examples in (259) and (260) suggest otherwise. If an adverb before the PP could modify the main verb, (259) should have a noncontradictory reading, and (260) should be acceptable, contrary to fact.

(259) # Al slashed his way rapidly through the dense bush slowly.
Intended: 'Al made his way through the bush slowly by slashing rapidly.'

(260) * Al smiled his way crookedly past the velvet ropes.
Intended: 'Al made his way past the velvet ropes by smiling crookedly.'

So the suggestion of (257) that Al's slashing was masterful, or of (258) that his smiling was confident, is apparently derivative of a broader assertion. In any case, what is most important here is that the adverb is *not* be construed with the path PP.

This would be mysterious if the path PP were an R predicate and the *way*-construction were a subtype of CC. Thus it will do no good to confound the two constructions. The *way*-construction is not a type of CC.

Given this, the surprising behavior of verbs in this construction, with requirements for an object being uniformly suspended, poses no threat to the generalization that such requirements are preserved in CCs. Of course the analysis of the *way*-construction remains open, and with it, the very important question of why a verb can occur in this construction without an argument it ordinarily requires. But I will not undertake to answer these questions here (see Goldberg 1995).

It is worth observing that adverbs in the *way*-construction behave as adverbs do in other complex predicates of motion along a path, such as those in (364), which are based on sentences discussed in Wechsler 1997.

(261) a. The wise men followed the star faithfully to Bethlehem.

b. John swam frantically across the pool.

Here again the adverb preceding the path PP may not modify the path PP. And again it is reasonable to consider the event named by the entire VP as the target of adverbial predication (though in this case it is more difficult distinguish modification of the whole VP from modification of the verb alone, since the verb describes not just the means of movement, but the act of moving itself). We will see in the next chapter that complex predicates like those in (364) are unlike CCs in other ways.

The removal construction

Sentence (246b), repeated here as (262), means that Al removed the soap from his eyes by washing *his eyes*, not by washing the soap. (262) does not entail (263). Thus the direct object in (262) does not have the thematic relation associated with the

direct object when wash heads a simple clause.

(262) Al washed the soap out of his eyes.

(263) Al washed the soap.

(262) stands for a large class of seeming exceptions to the UPP. These are sentences of the form "S V O_1 (P O_2)" which describe the removal of the O_1-referent from a location identified by O_2, by means of a V-action directed at that location.

Arguing against Hoekstra 1988, Levin and Rappaport Hovav 1995 show why sentences like this should not be considered CCs. The putative R predicate is necessarily a PP describing a path. If we replace out of his eyes with dirty, for example, the result is ungrammatical, (264). Grammaticality is restored, however, if the direct object identifies the patient of washing, as in (265).

(264) * Al washed the soap dirty.
Intended: 'Al made the soap dirty by washing something else.'

(265) Al washed his dirty hands clean, thereby making the soap dirty.

Moreover, the PP must describe, not just any path, but a path of removal. To see this consider (267), understanding it to mean that Al washes *his head*, thereby moving soap all over it. Then the sentence satisfies two conditions. The prepositional object identifies the patient of the verbal event, and the PP describes a path. But this is not enough to make the sentence grammatical. The apparent 'relocation' of the patient to the prepositional object, exemplified by (262), is licit only when the path is one of removal.[27]

[27]This generalization may need to be broadened, depending on one thoughts about sentences like (266). Does (266) entail that Al rubbed salt?

(266) Al rubbed salt into the pork shoulder.

If Yes, then (266) presents no new problem. But if No, then (266) poses the same challenge as (262). The direct object is not assigned the thematic relation associated with the direct object when the verb occurs without a path PP. Yet in (266) the PP describes a path of *insertion* or *application*, not

(267) * Al washed the soap over his head.
Intended: 'Al made the soap go over his head by washing his head.'

This would be hard to explain if (262) were a CC. Why would the direct object be constrained to identify the patient of washing when R is an AP, but not when it is a path PP? Absent an answer to this question, Levin and Rappaport decide, (262) should be treated as instantiating a distinct construction, which they call the removal construction.[28]

There is structural evidence that favors this conclusion. As observed above in section 2.9.2, in an uncontroversial CC, an adverb that intervenes between the direct object and R cannot modify the means event or the event of causation as a whole, whether R is an AP or a PP. (268a) cannot mean that the washing (clean) is frantic, and (268b) cannot mean that the beating (to death) is frantic. The only available interpretations are those where frantically modifies clean or to death, and these make no sense.

(268) a. # He washed his dirty hands frantically clean.

b. # He beat the intruder frantically to death.

In a removal construction, on the other hand, an adverb between O_1 and P *can* modify the event of V, or of the entire VP. To me the sentences in (269) seem fine.

(269) a. He washed the soap frantically out of his eyes.

b. He rubbed the tiredness languidly out of his eyes.
(based on an example from Hoekstra 1988)

a path of removal. Thus we would need to say that what 'licenses' this construction is not a path of removal, but any path of forcibly directed motion.

[28]Levin and Rappaport Hovav (1995) also endeavor to show that the direct object in a removal construction is in fact a lexical argument of the verb, rather than being (only) an argument of the path PP. But these arguments involve a suite of assumptions whose explication would be unnecessarily distracting in this context.

Thus the structure of the removal construction is distinct from that of the complex causative.

For me this means that sentences like (262) do not void the assumption that English has UPP, and so does not undermine the further observations based on that assumption.

It does, however, raise the difficult question of what the relation is between the wash that occurs in wash my eyes and the wash in wash the soap out of my eyes. Here I will just refer to answers proposed in Levin and Rappaport Hovav 1995 and Goldberg 1995. Levin and Rappaport treat the removal construction as expressing an alternative lexical argument structure for the verb that heads it. That is, they take (e.g.) wash to be lexically ambiguous, between 'to wash' and 'to remove by washing.' Insofar as it is carefully restricted, this sort of polysemy can be tolerated. Goldberg reaches a different conclusion. For her, the fact that wash may occur in two different arrays of argument relations indicates that *neither* array projects from the verb. Lexically, the verb has no arguments. Rather, it occurs in various environments which introduce arguments, including the simple transitive and the removal constructions. This conclusion goes against my suggestion that English has the UPP *because* its transitive verbs typically have lexical arguments. If Goldberg is correct, therefore, the UPP would have to explained otherwise, in terms of the structure of CCs. In note 3 of this chapter, I indicated how this might be done: if a transitive verb in M occupies the same local environment as it does in simple clauses, combining immediately with an object noun phrase, then the UPP is expected, regardless of the verb's lexical valence. But I also indicated a simple difficulty for this analysis, namely that M cannot be independently modified by an adverb; see section 1.6 of chapter 1.

The Boas example

Boas (2003) presents (246c), repeated here as (270), as evidence against the idea that English has the UPP. Most people I have asked do not accept the sentence at all, but let us take Boas's judgment seriously. In simple clauses the verb fry requires its patient to be identified, (271). Yet it seems to occur without a patient in (270), which is evidently a CC.

(270) Bernie fried the pan black.

(271) * Bernie fried.
Intended: 'Bernie fried stuff.'

Significantly, Boas's sentence does not survive even small changes in the means verb. (270) contrasts with the sentences in (272) and (273). These I find wildly unacceptable under the intended interpretations.

(272) * Bernie boiled his kettle black.
Intended: 'Bernie made his kettle black by boiling stuff in it.'

(273) * Bernie braised his stewpot black.
Intended: 'Bernie made his stewpot black by braising stuff in it.'

The unacceptability is not semantic, in the strict sense, since the intended meanings of (272) and (273) describe plausible situations. (In fact they describe true situations if 'Bernie' is a pseudonym for Alexander Williams.) But neither can the contrast between (270) and (272,273) be traced to a difference in the distributional behavior of the verbs in simple clauses. Like fry, boil and braise strongly resist omission of their patients, (274,275).

(274) * Bernie boiled.
Intended: 'Bernie boiled stuff.'

(275) * Bernie braised.
Intended: 'Bernie braised stuff.'

So then why is (270) so much better than (272) or (273)?

I believe the deciding difference is in the degree to which the action of the verb can be seen as applying equally to the cooking vessel as to its contents. Consider the various continuations of (276) in (a,b,c).

(276) In order to form a protective patina on its surface, ...

a. ? you should just fry the pan with nothing in it.

b. * you should just boil the kettle with nothing in it.

c. * you should just braise the stewpot with nothing in it.

(276a) is much better than the others. We are far more willing to say that we fry a frying pan if we put the vessel on the fire, than we are to say that we boil a kettle or braise a stewpot. Thus I suggest that (270) is acceptable exactly because, contrary to initial assumptions, it *does* represent the pan as the patient of frying. The data in (277–279) seem to confirm this idea. Even though (277) is ungrammatical, (278) is acceptable, exactly as expected given that (279) is acceptable as well.

(277) * Bernie roasted.
Intended: 'Bernie roasted stuff.'

(278) Bernie roasted the pan black.

(279) In order to form a protective patina on its surface, you should just roast the pan with nothing in it.

Boas's example therefore does nothing to contradict the observation that English has the UPP. In fact it provides a subtle kind of support.

Idioms derived from complex causatives

Sometimes a word form occurs in a structure where we would not expect it to, given its usual meaning and the usual distribution of words in its category. More precisely,

the form occurs where it should not, if indeed it pronounces the morpheme it usually does. For instance, the form the occurs in the bigger the better. If this pronounces the determiner the, this is unexpected. No other determiner can occur in this environment, and the meaning of this the is evidently not that of the ordinary determiner. In such cases, it usually seems the wrong response to eliminate from the grammar the generalizations which make the seemingly special association seem special. It would seem wrong, for instance, to conclude from the bigger the better that, in principle, any determiner can occur in this comparative structure, and that all determiner meanings are indeterminate between the ones manifested in the usual (adnominal) environment and the comparative environment. Rather we ought to acknowledge that the association is indeed somehow special, 'idiomatic.' Or, what might amount to the same thing, we should assume that the word form pronounces two morphemes, one of which occurs only in the special structure.

Nothing excludes the possibility that an idiomatic association may involve a grammatical structure that is itself generated by productive rules. So it should not be shocking if, sporadically and unsystematically, we find special associations between a word (form) and the complex causative structure. In particular, we should not upend our observation that English has the UPP if we find an occasional CC that makes English look momentarily like Mandarin.

I believe this is the story of examples like (280).

(280) "[H]ard-liners ... argued than an all-out arms race would spend the Soviet Union into bankruptcy ..." (T. Powers, 'Tomorrow the World,' *New York Review of Books*, 11 March 2004)

Here the spender is identified by the object (the Soviet Union), while the subject (an all-out arms race) identifies the motive for spending. Yet this arrangement is impossible when (a verb pronounced) spend heads a simple clause.

(281) * An all-out arms race would spend the Soviet Union.
Intended: 'An all out arms race would prompt the Soviet Union to spend.'

So if (280) is a CC, built according to the usual principles of the grammar, and if the verb in M is the usual verb spend, the sentence is a plain exception to the UPP.

This use of spend, in construction with a PP describing a path to ruin, is common in the argot of economic policy debate. It was popularized in connection with a policy, allegedly pursued by the Reagan administration, of raising U.S. military spending to a level which the Soviet Union could not match, thereby bankrupting the enemy.

So far as I can tell, the earliest such uses of spend have the subject identifying a *spender*, not just a motive for spending. This is the case in (282), which says that Reagan spends, and this makes the Soviet Union submit. We know that the submission actually results from the Soviet attempt to match U.S. spending, but we know this because we understand the Cold War, and not because we understand the sentence.

(282) "[Reagan] said that he would spend the Soviet Union into submission."
(A. Beichman, "Eight Years that Shook the World,"
www.hooverdigest.org/023/beichman.html)

Sentences like this do not violate the UPP. In simple clauses, spend can occur with the spender in the subject, and no specification of what is spent, (283). So in CCs like (282), the verb behaves as it behaves in simple clauses.

(283) The government will spend.

The exceptional usage illustrated by (280) therefore seems to have derived historically from one that was unexceptional, and in manifest compliance with the UPP.

This makes it plausible to view (280) as reflecting an idiomatization of the spend + 'path to ruin'-PP collocation, since we can then explain why there should be an unusual arrangment of thematic relations just in this particular case. In its original

use, the collocation describes the object-referent (the USSR) as driven to ruin by the spending of the subject-referent (the USA). But the situations described by the collocation happened to be ones where the proximate cause of ruin was correlative spending by the *object*-referent (the USSR). They were situations, that is, in which the object-referent (the USSR), like the subject-referent (the USA), was also a spender, but relative to a different event of spending. They were also situations where the ruinous spending of the object-referent (the USSR) was instigated by the referent of the subject (the USA). Under this description of the situation, the object identifies the agent of spending, and the subject, the agent of causation. And this description, evidently, has come to be idiomatically associated with the collocation, thus allowing sentences like (280). In effect, we have a 'spend-to-ruin' idiom—and we understand exactly how it came to be.

Suppose we reject this analysis, and instead view (280) as instantiating a normal CC construction with the normal verb spend in M. Then we predict that the peculiar arrangement of thematic relations in (280) is generally available, to any CC, with little or no dependence on what verb is in M. We predict, that is, that English should be just like Mandarin. But this is wrong. The occurrence of (280) does nothing to improve the status of (284).

(284) * Those slogans yelled my throat hoarse.

This is a surprise if (280) reflects the basic grammar of English verbs. But it is no surprise if we recognize (280) as instantiating an idiomatic construction, limited just to the verb spend, and derived under very particular historical circumstances. Of course, there may be other cases, sporadically, that raise the same challenge as (280). But if there are, my prediction is that they will all submit to a similar explanation.

Chapter 3

Intransitive complex causatives

3.1 Introduction

3.1.1 Overview of the chapter

Chapter 2 treated only CCs where control is by the surface object, which I call transitive. I now discuss what I call intransitive CCs, where control is by the surface subject. English (285), Igbo (286), and Mandarin (287) are examples.

(285) The lake froze solid.

(286) Osisi ahụ da ji -ri adaji.
tree that fall snap -FACT BVC
'That tree got snapped from falling.'

(287) neìge haízi dòng bìng -le
that child freeze be ill -LE
'That kid got ill from freezing.' (Ma 1987: 439; tr. AW)

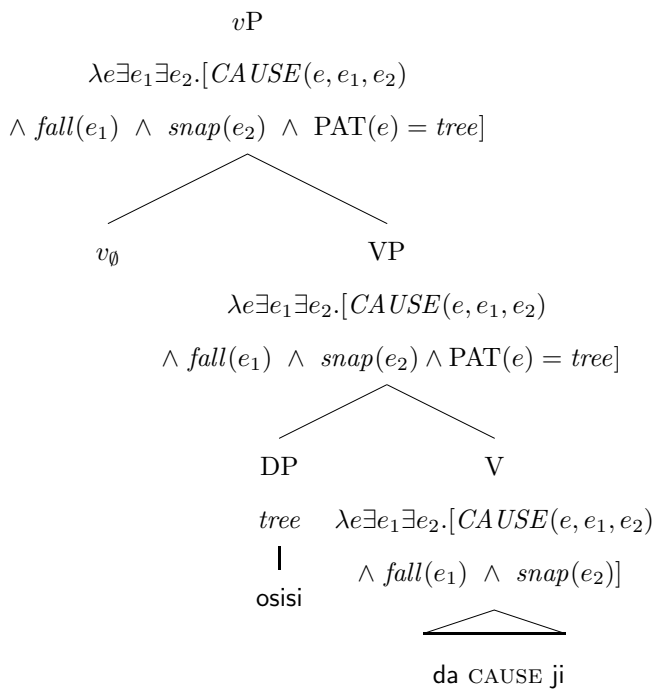
My glosses of intransitive CCs will again follow a uniform format, whenever possible. When R translates to an English adjective, I will say 'SUBJECT got R from M'ing,'

(287). When R translates to an English verb, I will say 'SUBJECT got R'd from M'ing,' with the verb in its participial form, (286).

The structure of an intransitive CC, I believe, is just that of the VP in a transitive. They differ only in lacking the structure that introduces an agent of causation, namely v_{AG}, according to the implementation of chapter 2. Correspondingly, the surface subject of an intransitive is the direct object underlyingly; its surface position is derived by raising. In short, subject-control CCs are unaccusatives.

Thus I assume that Igbo (286), for example, has the base structure in (288). For the sake of syntactic uniformity, I assume a head $v_{\emptyset}$ where I have v_{AG} in the transitive. This head will also allow a convenient formalization of certain distributional generalizations described below. But $v_{\emptyset}$ does not introduce a thematic relation, and I have no reason to assign it any other meaning; I take it to be semantically vacuous.

(288)



The idea that intransitive CCs are unaccusative is common; see e.g. Nwachukwu 1987, Gu 1992, Levin and Rappaport 1995, Hale et al. 1995, among many others. But

it is more often presupposed than demonstrated, and criticisms of the idea (e.g. in Y. Li 1995, Wechsler 1997, and Rappaport Hovav 2001) have consequently been influential. Moreover, while an unaccusative analysis for English intransitives like (285) may seem obvious, it does not seem so for Mandarin examples like (289), whose direct counterpart in English is ungrammatical, (290).

(289) wǒ zǒu fá -le.
1s walk weary -LE
'I got weary from walking.'

(290) * I walked weary.

Overall, the aim of this chapter is to justify the commitments of an analysis like (288) empirically. Central among these are two related propositions: (i) the surface subject in an intransitive is the direct object underlyingly; and (ii) in Mandarin and Igbo, the surface subject in an intransitive shows the same freedom of interpretation with respect M as does the object in the transitive. As I make these points, new insights will arise concerning agentivity and the distribution of agents in all three languages, complementing what we learned about patients in chapter 2, and enriching the case for the NAT.

Section 3.2 demonstrates that the "direct object restriction" (Simpson 1983, Levin and Rappaport 1995), or DOR, is valid across languages. Control of R is always by the underlying direct object of the clause. This fact, otherwise obscure, emerges clearly once the UPP is recognized as an independent factor, and the data are controlled for its effects. Then we need only observe that subject-control CCs, unlike object-control CCs, never refer to an agent of causation—a pattern which can itself be seen as reflecting the basic principle that one phrase cannot be assigned two distinct thematic relations to the event of a single predicate. Mainly the DOR is just a restatement of this observation in the context of a grammatical framework that includes unaccusative

structures. Claims that the DOR is not valid, I argue, either misinterpret its content or misidentify other constructions as CCs.

Section 3.3 returns to the NAT. Intransitive CCs reinforce the conclusions derived from transitives in chapter 2. They also introduce new evidence against a comprehensively projectionist model for *agent* relations in Igbo and Mandarin. Again, we will see that principles relating the occurrence of a thematic relation to the event-type of the predicate are stated over individual verbs in English, but over maximal VP predicates in Igbo and Mandarin. In the case of agents, furthermore, there is a clear difference in what those principles are. In English, if the event of the predicate necessarily has an agent, it will always cooccur with a noun phrase identifying its agent (Haspelmath 1993, Levin and Rappaport 1995). But in Igbo, I will suggest, such a requirement follows just when the *animacy* of the entailed agent is intrinsic to the definition of the event. And in Mandarin, even this narrower condition does not hold: predicates whose event involves an agent that must be animate can nevertheless occur in nonagentive contexts. The section ends with an analysis of subject-control CCs where a second noun phrase follows the predicate, a type whose properties motivated the theory of Mandarin CCs in Y. Li 1990.

Lastly, in the brief section 3.4, I address the "Argument-per-Subevent Condition" of Rappaport Hovav and Levin (1998, 2001). This principle claims that the number of argument NPs in a clause matches the number of "subevents" in the event it describes. I show that this idea is contradicted plainly by the Igbo facts reviewed in section 3.4.

3.1.2 Intransitive CCs in Igbo and Mandarin

It will help to get acquainted with the particular nature of Igbo and Mandarin intransitives right at the outset. (286) and (287) are our first examples, repeated here

as (291) and (292).

(291) Osisi ahụ da ji -ri adaji.
tree that fall snap -FACT BVC
'That tree got snapped from falling.'

(292) neìge haízi dòng bìng -le.
that child freeze be ill -LE
'That kid got ill from freezing.' (Ma 1987: 439; tr. AW)

In these M is a verb which can occur in a simple clause without an argument identifying an agent of its event, (293,294). Moreover the event of the verb is one which (so one thinks) can transpire spontaneously, without the instigation of an agent.

(293) Osisi ahụ da -ra ada.
wood that fall -FACT BVC
'The tree fell.'

(294) nèige háizi dòng -le.
that child freeze -PFV
'That child froze.'

(295) and (296) are also intransitive CCs: the subject controls R.

(295) Ọba ahụ kụ wa -ra akụwa.
gourd that strike split -FACT BVC
'That gourd got split from striking.'

(296) hēibǎn cā gānjing -le.
blackboard wipe clean -LE
'The blackboard got clean from wiping.' (H. Huang 1982: 56; tr. AW)

But these differ interestingly from (291) and (292). The verb in M is not one that can occur in simple clauses without an argument identifying the agent of its event,

(297,298). And the event of the verb is not understood as one that can transpire spontaneously.

(297) * Ọba ahụ kụ -rụ akụ.
gourd that strike -FACT BVC
Intended: 'That gourd underwent striking.'

(298) * hēibǎn cā -le.
blackboard wipe -PFV
Intended: 'The blackboard underwent wiping.'[1]
Can mean: 'The blackboard, *pro* wiped'; see discussion below.

(299), which repeats (289), has the same property; M is an agentive verb. But here, unlike in (291) and (292), the subject is construed as the agent of the means event, rather than as its patient.

(299) wǒ zǒu fá -le.
1s walk weary -LE
'I got weary from walking.'

These facts will form the basis form my conclusions in this chapter, and I will return to them repeatedly.

But one thing must be understood now. In cases like (295) and (296)—where M is an agentive verb, but no phrase identifies the agent of its event—there is furthermore no *reference* to the agent of that event (Gong 1980, Ma 1987, Nwachukwu 1987, Tan 1991). And we will see in section 3.2.3 that, categorically for all subject-control CCs, there is no reference to an agent of causation (Y. Li 1990, 1995).

[1](298) is ungrammatical if the intended interpretation is eventive. Possibly, though this is not clear, the sentence may have an acceptable intransitive parse *if* it is understood as a resultative stative, meaning 'The blackboard is in the state that results from wiping.' But this reading would be irrelevant here, since this resultative meaning is not part of the meaning of cā gānjīng 'wipe clean.' (296) does not say that the cleanness of the blackboard is caused by a result state of being wiped. What caused its cleanness was an *event* of wiping.

It is possible to say (295) while facing a broken gourd, without suggesting even vaguely that it is known who or what struck it. Likewise one can say (296) while facing a clean blackboard, without invoking its wiper at all. In this way the intransitives, (295) and (296), contrast with the transitives in (300) and (301). These sentences do refer to an agent. The referent of the subject pronoun is the agent of causation, which is here understood to be the agent of the means event as well.

(300) Ọ kụ wa -ra ọba a.
3sS strike split -FACT gourd this
'S/he made the gourd split by striking.'

(301) *pro* cā gānjīng -le hēibǎn.
pro wipe clean -PFV blackboard
'(I/you/he/she/etc.) made the blackboard clean by wiping.'

Thus (295) does not have a silent counterpart to the subject pronoun in (300); and (296) has at least one interpretation where it does not contain the silent subject pronoun present in (301).

More than this, (295) and (296) make no *indefinite* reference to an agent either. They are not impersonal constructions, with a fronted object and a silent subject referring to an unspecified 'somebody.' Igbo has an impersonal form, indicated by the presence of the default subject prefix (a-/e-) without any additional agreement for person. (302) is an impersonal transitive, and it contrasts clearly with the intransitive (295).[2] Only (302) refers to an unspecified agent for the event of the CC, presumably the striker.

[2]At least for many Igbo speakers, it is possible to front the object in an impersonal transitive. In that case there is a minimal formal contrast between the impersonal and the intransitive—but still the semantic contrast remains clear.

(302) A- kụ wa -ra ọba ahụ.
DSP strike split -FACT gourd that
'Someone made that gourd split by striking.'

In Mandarin there is no silent pronoun with indefinite reference: the sentence in (301) cannot be given an impersonal interpretation, (303). Thus one cannot posit a silent impersonal subject in (296), then parse the initial noun phrase as a fronted object.

(303) * *pro* cā gānjīng -le hēibǎn.
pro wipe clean -PFV blackboard
Intended: 'Someone made the blackboard clean by wiping.'

This is not to say, however, that the intransitives entail that no part of the CC event involves an agent. Every speaker of Igbo knows that events described by kụ 'strike' involve a collision of two things, a striker and a strikee. Every speaker of Mandarin knows that events described by cā 'wipe' do not happen without a wiper. And in using (295) and (296), where these verbs describe the means event, they say nothing that contradicts this understanding. These sentences neither assert nor presuppose that the means event transpired spontaneously. They simply do not *refer* to an agent. Not referring to something is different from saying it doesn't exist.

We must take care, therefore, to avoid importing into Igbo and Mandarin the assumption, derived from the patterns in English (see Haspelmath 1993), that intransitives where no argument noun phrase receives the agent role imply that their event transpired spontaneously. I return to this point in section 3.3.4.

Perhaps it is best to think of the Igbo and Mandarin intransitives as having basically the semantics of their R predicate, plus something (L. Li 1980). Like (304) below, (295) describes the gourd becoming or being split; and like (305), (296) describes the blackboard as becoming or being clean.

(304) Ọba ahụ wa -ra awa.
gourd that split -FACT BVC
'That gourd split / is split.'

(305) heībǎn gānjing -le / hěn gānjing.
blackboard clean -LE / very clean
'The blackboard got clean / is clean.'

What the intransitive CC adds is information about the ontogeny of the state or state-change. (295) says that the splitting was caused by striking, (296) that the cleanness was caused by wiping. These are events that necessarily have agents, but (295) and (296) do not refer to them.

Having understood this much, we need to be aware of a structural ambiguity in Mandarin. In general, any string that can be analyzed as a subject-control CC has a second parse. The second parse treats the initial NP as a fronted object, and has a silent pronoun with definite reference in the subject position, (306).

(306) hēibǎn, *pro* cā gānjing -le.
blackboard pro wipe clean -PFV
'The blackboard, (I/you/he/she/etc.) made clean by wiping.'

This parse of course has a distinct interpretation. It *does* refer to an agent, an individual salient enough in the discourse to serve as the antecedent for *pro*. Thus (306) would be natural following (307), with *pro* referring to the individual picked out by tā '3s.'

(307) tā méiyǒu sǎo dì, dànshì ...
3s NEG.PFV sweep floor, but ...
'S/he did not sweep the floor, but ...'

The intransitive parse, under which the NP that controls R is the subject, can be distinguished formally from the transitive parse, where it is a fronted object. Fronted

objects in Mandarin cannot be questioned, (308). But as Tan 1991 observes, the initial NP in (296) can be, (309). And if it not a fronted object, it is presumably the subject.[3]

(308) * shénme dōngxī, Lǎo Wèi cā gānjing -le.
what thing L.W. wipe -clean -LE
Intended: 'What did Lao Wei make clean by wiping.'

(309) a. shénme dōngxī cā gānjing -le?
what thing wipe -clean -LE
'What got clean from wiping?'

b. nǎge fángjiān -de hēibǎn cā gānjing -le?
which room -NMOD blackboard wipe clean -LE
'Which room's blackboard got clean from wiping?'

Sometimes a question about the subject of a subject-control CC may be awkward for pragmatic reasons. But the fact that such questions are possible verifies our assumption that there are indeed CCs where the surface subject controls R.

In what follows, when I present a CC where a preverbal noun phrase controls R, and there is no other overt preverbal argument, the reader should disregard the possible transitive parse, and understand that I am concerned with the intransitive parse only.

[3]This conclusion agrees with what seems to be the consensus in the literature. Most analysts accept that Mandarin has instransitive clauses, not marked as passive, where the subject identifies the patient of the event of the predicate, even though that event is one which necessarily involves an agent. See Gong 1980, H. Huang 1982, L. Li 1985, Tan 1991, and Li and Thompson 1994 for discussion; and compare Diller's (1993) comments on detransitives in Thai. Tan 1991 and Li and Thompson 1994 refer to these "lexical passives," an unfortunate term, since such clauses, unlike typical passives, evidently lack indefinite reference to an agent. Gong 1980 and many others in the Mandarin-language literature refer to them as one type of "shòushi zhǔyǔ jù," or patient-subject clauses. For arguments against the consensus view, and against the idea that there is such a thing as a 'subject' in Mandarin, see La Polla 1988, 1993.

3.2 The Direct Object Restriction

3.2.1 Introducing the Direct Object Restriction in English

The analysis of intransitive CCs in English has figured importantly in establishing the *direct object restriction*, (310) (Williams 1980, Simpson 1983, Levin and Rappaport 1995).

(310) Direct Object Restriction (DOR)
The phrase that controls R is always the direct object of the clause.

The initial motivation for the DOR comes from transitive CCs like (311–313). R can be controlled by the direct object of the clause, (311), but not by an oblique (312). And when there is both a subject and an object, control by the subject is evidently impossible, (313).

(311) Al pounded the cutlet flat.

(312) * Al pounded against the cutlet flat.

(313) * Al pounded the cutlet weary.

The impossibility of control from inside a prepositional phrase, (312), is not surprising, and does not require a restriction as strong as the DOR. Inside a PP, the cutlet does not c-command R. Under normal assumptions about compositionality, this prevents the establishment of any direct semantic relation between their meanings. Nor can the PP itself provide a patient for R, since it does not denote in the right type. For these reasons I will assume that cases like (312) fall under a generalization broader than the DOR.

But the failure of (313) is impressive, and something like the DOR is needed to describe it. The subject *does* c-command R, and the intended meaning is plausible: one can easily tire oneself by pounding cutlets. (314) makes the point more dramatically.

(314) Rocky's fists pounded the frozen meat bloody.

In the film *Rocky*, Rocky's fists are bloodied as a result of their pounding a frozen side of beef. Yet (314) cannot not describe this event. It can only mean that the meat became bloody. And this is what the DOR predicts.

Examples like (315) clarify the nature of the restriction. The DOR restricts control of R to the direct object of the *clause*. It requires no particular relation to the means verb.

(315) a. Al shouted his throat hoarse.

b. Al hiked his boot soles thin.

In these sentences it is still the direct object that controls R. His throat and his boot soles are the direct objects of their clauses. Yet the referents of these phrases are not assigned a thematic relation to the means event. More precisely, they do not have the interpretation an object has in a simple clause headed by the verb in M, (316). Al's throat is not shouted and his boot soles are not hiked.

(316) a. * Al shouted his throat.

b. * Al hiked his boot soles.

It is a mistake, therefore, to think that the DOR assigns control of R to the direct object *of the means verb*, whatever that may mean. It says only that control goes to the direct object of the CC clause.

Often it happens that the direct object does have a certain relation to M. In (311), Al pounded the cutlet flat, the object identifies the patient of the means event; it thus has the same interpretation as an object in a simple clause headed by pound. But this does not reflect the DOR. It reflects the UPP. In a simple clause the verb pound

finds its patient in the object, and since English has the UPP, it finds it in the object of a CC clause as well.

This understanding, that the DOR as such requires nothing of the relation between the direct object and the means verb, will be especially important when we discuss Igbo and Mandarin, languages without the UPP.

3.2.2 An argument for the DOR from the UPP

The main challenge to the DOR is subject-control CCs, like (317). If the DOR is correct, the surface subject of any subject-control CC must be its direct object underlyingly. On what grounds can one argue that this is correct?

(317) The lake froze solid.

Simpson 1983 and Levin and Rappaport Hovav 1995 appeal to the unaccusativity of the verb in M. By definition, the sole argument of an unaccusative is underlyingly a direct object, in simple clauses. Suppose that the same is true when an unaccusative is the means verb in a CC: there too it will find its sole argument in the direct object of the clause. Then if freeze is unaccusative, the surface subject of (317) must be an object in underlying structure, and this brings the sentence into compliance with the DOR. Levin and Rappaport Hovav thus conjecture that every subject-control CC has an unaccusative verb in M. For English this appears to be basically correct, but there are some apparent counterexamples, which I will discuss in section 3.2.8.

This argument crucially presupposes the UPP: "[it] is based on the assumption that [...] the way [a verb] maps its arguments to the syntax, does not change when the verb is in a [complex causative]" (Levin and Rappaport Hovav: 1995: 53-4).[4] But this assumption, it must be understood, is not itself part of the DOR, or of

[4]Simpson 1983 does not recognize the UPP as an independent assumption, but it happens to be entailed by her Lexicalist theory of complex causative predicate formation.

the hypothesis that freeze is unaccusative. Its role in the argument is auxiliary and diagnostic. By making it, we can conclude from the presumed unaccusativity of freeze that the surface subject of (317) is underlyingly the direct object of the CC clause.

Since the DOR is logically independent of the UPP, a language without the UPP may still comply with the DOR. All that is required is that control go to the underlying object. No particular relation between the controller and the means verb is expected or necessary.

But of course in languages without the UPP, arguments either for or against the DOR cannot rely on the UPP as a premise, as Levin and Rappaport Hovav's argument does. And consequently such arguments cannot appeal to how the means verb behaves when it heads a simple clause. Without the UPP, such facts are irrelevant to the structure of a CC.

Suppose, for example, that Mandarin bìng 'be ill' is unaccusative; in simple clauses it finds its patient in the object. Absent the UPP, this tells us nothing about whether an argument understood as its patient in a CC is a subject or object underlyingly, and hence does not prove that (318) obeys the DOR.

(318) tā bìng sǐ -le.
3s be ill die -le
'S/he died from being ill.'

For the same reason, (319) does not show that Mandarin violates the DOR, even if we assume that zǒu 'walk' is unergative.[5] It may be that the argument understood as the walker in a simple clause with zǒu 'walk' is the underlying subject. But that tells us nothing about where that argument is located when zǒu 'walk' is in M, since

[5]The verb zǒu is ambiguous. It can mean either 'to walk' or 'to leave.' I am discussing the former meaning, under which the verb is probably unergative; this zǒu can take the generic object lù 'road.' Under the meaning 'leave,' the verb is probably unaccusative; it cannot take an object in simple clauses.

Mandarin lacks the UPP. The same goes for (320).

(319) tā zǒu fá -le.
3s be ill die -LE
'S/he got weary from walking.'

(320) tā hē zuì -le.
3s drink drunk -LE
'S/he got drunk from drinking.'

Many arguments either for or against the DOR in the literature on Mandarin fail to appreciate this (e.g. Y. Li 1995), and are therefore invalid.

Demonstrating that Igbo and Mandarin intransitive CCs comply with the DOR will require an argument that makes no appeal to properties of the means verb. The basis for such an argument is provided by an observation about the semantic structure of CCs which appears to hold universally: the subject controls R if and only if the CC does not refer to an agent of causation. I will establish this in the following subsection. We will then see that this observation is itself tantamount to the DOR, if one accepts certain common assumptions about unaccusativity.

3.2.3 Subject-control CCs are nonagentive

Subject-control CCs differ semantically from object-control CCs. The latter refer to an agent of causation but the former do not. I will call this the causer/controller disjunction, (321).

(321) Causer/Controller Disjunction
If the subject of a CC controls R, then the CC does not refer to an agent of the event of causation; and if a CC refers to an agent of causation, then the direct object controls R.

We can add to this a more obvious observation about the syntactic position of the phrase that identifies the agent of causation. When there is such an agent, it is always identified by the subject; see chapter 2. Combining this with (321) we have (322).

(322) The phrase that controls R never identifies the agent of causation.

Sometimes I will abbreviate (321) by saying simply that subject-control CCs are nonagentive. This should not be misunderstood as saying that the verb in M is nonagentive, or that no argument is ever understood as the agent of the means event. (321) is about the CC predicate as a whole, and the event of causation that it describes.

First consider English from the perspective of (321). (323) is a subject-control CC. It describes an event of causation, wherein the lake's freezing causes its solidification. But in accord with (321), it does not itself assert that this event was initiated by the lake, or by any other agent. The event of causation is not described as having an agent, any more than the event of freezing is.

(323) The lake froze solid.

In (324) and (325) it is the direct object that controls R. And here it is at least reasonable to say that the subject, besides naming the agent of the means event, also names the agent of causation. (325), for example, describes an event of Al's shouting causing hoarseness in his throat, and if anything can be said to have initiated this event, it is Al himself.

(324) Al pounded the cutlet flat.

(325) Al shouted his throat hoarse.

Thus it is possible to describe the facts of English as following (321), if we wish to. But why would we? In English, a UPP language where the agent of M will always be identified by the subject of the CC, the supposed agent of causation is always

identical to the agent of the means event, and so (321) seems gratuitous. Why not just say that control goes to the subject just when there is no reference to an agent of the *means* event? For English this statement appears to hew more closely to the facts.

The motivation for the broader generalization, (321), becomes clear in Igbo and Mandarin. In these languages, which lack the UPP, relations to M do not align uniformly with the subject or object. (In section 3.3.2 below, we will see direct evidence that this is true for intransitive CCs in particular, as was observed for transitives in chapter 2.) Thus we cannot predict, as we can in English, whether the subject controls R based just on whether it is the agent of M. Look at the Mandarin sentences in (326) and (327). The subject names the agent of the means event in (326), but the patient of the means event in (327). Yet control of R nevertheless differs between the (a) and (b) cases.

(326) a. wǒ tī duàn -le nàtiáo mùbǎn.
1s kick snap -PFV that plank
'I made that plank snap by kicking.'

b. wǒ zǒu fá -le.
1s walk weary -LE
'I got weary from walking.'

(327) a. nà píng jiǔ hē zuì -le wǒ.
that bottle wine drink drunk -PFV 1s
'That bottle of wine made me drunk from drinking.'

b. wǒ dòng bìng -le.
1s chill be ill -LE
'I got ill from being cold.'

Control *can* be predicted, however, based on whether there is reference to an agent of causation. In Mandarin, unlike in English, this category can be distinguished clearly

from the agent of the means event. Consider (327a). Its subject names the agent of causation but not the agent of the means event; its object names the agent of the means event but not the agent of causation. And we will see that, in (326b) as well, the subject names the agent of the means event but not the agent of causation. With this distinction made, the pattern of (321) stands out plainly. When the subject is interpreted as naming the agent of causation, (326a,327a), the object controls R, and when the subject controls R, (326b,327b), there is no reference to an agent of causation at all.

Yafei Li (1990) and others (Wang 1958, C.-T. J. Huang 1988, Gu 1992, Chang 1998) have observed this correlation in Mandarin,[6] and I will present evidence that confirms it in the remainder of this subsection.

What I want to stress immediately, however, is that this correlation does not describe only Mandarin, or only Mandarin and Igbo. It describes English as well. This just stands out less clearly, because English has the UPP. The causer/controller disjunction thus seems to reflect a common core to the semantic structure of CCs across languages. This is, all by itself, a significant observation. It also suggests a criterion of adequacy for any theory of a given CC construction. Lest the cross-linguistic validity of (321) come off as accidental, the theory should have principles that entail (321) at its core, ideally the same principles that account for (321) in any language. Further patterns in the grammar of the construction, which are not found in all CCs universally, should then follow from additional considerations that may not be active in every language.

[6]In the literature on Mandarin CCs, subject-control CCs are sometimes described as being "not causative" (C.-T. J. Huang 1988, Y. Li 1990, Gu 1992, Chang 1998). What is meant by this is that, as stated in the causer/controller disjunction, they make no reference to an agent of causation. It is not meant as a comment on the relation between the eventualities of M and R, which (a fortiori) remains one of causation.

Now let us see some of the concrete evidence that subjects in subject-control CCs are not understood as agents of causation. Here I will only discuss Mandarin, since it presents the more difficult case. In Mandarin we commonly find subject-control CCs where the subject is understood as naming the agent of the means event, like (319) and (320). Yet even in these, there is no reference to an agent of causation.

Questions like (328) can be used to diagnose agentivity. An answer is felicitous only if it describes an event of which X is the agent (Teng 1975). Thus the answers to (329) in (330a) are acceptable, but those in (330b) are not.

(328) X zuò -le shénme?
do -PFV what
'What did X do?'

(329) Lǎo Wèi zuò -le shénme?
L.W. do -PFV what
'What did Lao Wei do?'

(330) a. i. (tā) zá -le nà kuài ròu.
(3s) pound -PFV that chunk meat
'S/he pounded that piece of meat.'

ii. (tā) hē -le sān beì jiǔ.
(3s) drink -PFV three cup wine
'S/he drank three glasses of wine.'

b. i. # (tā) zuì -le.
(3s) drunk -PFV
'S/he is/got drunk.'

ii. # (tā) sǐ -le.
(3s) die -PFV
'S/he died.'

This test shows that the subject of a CC, when it controls R, is not an agent of the event the CC describes. Question (329), repeated as (331a), cannot be answered by any of the CCs in (331b), where the subject controls R. Thus none of these present Lao Wei as the agent of their event, the event of causation, even when he is the agent of its constituent means event, as in (331b-i) and (331b-ii).

(331) a. Lǎo Wèi zuò -le shénme?
L.W. do -PFV what
'What did Lao Wei do?'

b. i. # (tā) hē zuì -le (jiǔ).
(3s) drink drunk -PFV (wine)
'S/he got drunk from drinking.'

ii. # tā zǒu fá -le.
L.W. walk -weary -LE
'Lao Wei got weary from walking.'

iii. # tā bìng sǐ -le.
L.W. be ill die -PFV
'Lao Wei died from being ill.'

Object-control CCs, in contrast, generally make good answers to questions like (328). (331c), for example, is a fine answer to (331a). Here the object controls R and the subject is understood as the agent of causation.

(331) c. (tā) zá píng -le nà kuài ròu.
(3s) pound flat -PFV that chunk meat
'S/he made that piece of meat flat by pounding.'

And again, what matters is not agentivity with respect to the means event. To the extent that it is possible to ask (332a), thereby personifying the bottle somewhat, the object-control CC in (332b) is a good answer. Here the subject names the agent of causation, but not the agent of the means event.

(332) a. ? nà píng jiǔ zuò -le shénme?
that bottle wine do -PFV what
'What did that bottle of wine do?'

b. *pro* hē zuì -le wǒ.
it drink drunk -PFV (wine)
'It made me drunk from drinking.'

Thus the subject of a CC names the agent of its predicate's event if and only if it does not control R, as stated above in (321).

Additional support for this conclusion comes from the distribution of the progressive auxiliary (zhèng) zaì. This progressive is compatible with a predicate only if the subject identifies the agent of its event, (333).

(333) a. tā (zhēng) zaì hē jiǔ.
3s PROG drink wine
'S/he is drinking wine.'

b. # tā (zhēng) zaì sǐ.
3s PROG die
'S/he is dying.'

The progressive is never compatible with a CC whose subject controls R, (334), even when the subject identifies the agent of the means event, as in (334a) and (334b). In subject-control CCs, therefore, the subject is not the agent of its predicate's event, the event of causation.

(334) a. # tā (zhēng) zaì hē zuì jiǔ (le).
3s PROG drink drunk wine (LE)
Intended: 'S/he is making himself drunk by drinking.'

b. # tā (zhēng) zaì zǒu fá (le).
3s PROG walk weary (LE)
Intended 'S/he is making himself weary by walking.'

c. # tā (zhēng) zaì bìng sǐ (-le).
3s PROG be ill die (LE)
Intended: 'S/he is making himself die from being ill.'

The progressive is often compatible with object-control CCs, however, like (335), confirming that in these cases the subject is construed as the agent of causation.

(335) tā (zhēng) zaì zá píng nà kuài ròu.
3s PROG pound flat that chunk meat
'S/he is making that chunk of meat flat by pounding.'

Further conditions prevent the progressive from occurring with every object-control CC. Predicates that accept (zhèng) zaì must denote events understood as extended over time, either by duration or by repetition. Thus (335) is more natural than (336), since a shattering blow is most likely instantaneous, and a vase can be shattered only once.

(336) ? Lǎo Weì zaì dǎ suì huāpíng.
L.W. PROG hit shattered vase
Intended: 'He is making the vase shatter by hitting it.'

The subject must also be animate, which may explain why (337) is unacceptable.

(337) # nà píng jiǔ zhēng zaì hē zuì wǒ.
that bottle wine PROG drink drunk 1s
Intended: 'That bottle of wine is making me drunk from drinking.'

But interestingly, it does not seem strictly necessary that the subject name the agent of the means event. Some speakers accept (338).

(338) ? Lǐ Zǒngtǒng, nǐ zaì è sǐ jǐ qiān ge xúeshēng!
Li president, 2s PROG hungry die several thousand CLS student
'President Li, you are making several thousand students die from hunger!'

Here the subject is presumably not the agent of the means event, since è 'to be hungry' is an intransitive verb that (in simple clauses) cannot occur with an agent argument. Yet the progressive is acceptable insofar as President Li is the agent of causation, and he is actively doing something that makes the students die from starvation.

In conclusion, it is clear that subject-control CCs in Mandarin are always nonagentive. They make no reference to the agent of the CC event, the event of causation, even in cases where the subject is construed as naming the agent of its means event. I know of no language, moreover, where the facts seem any different.

3.2.4 Explaining the causer/controller disjunction

Section 3.2.5 will show that the DOR can reduced, in large part, to the causer/controller disjunction. Here I pause to consider the motivations for the causer/controller disjunction itself. I suggest that it reflects more basic principles.

In chapter 2 I posited that, in Mandarin and Igbo, control of R is a semantic consequence of being the patient of causation. The grammar constrains a certain noun phrase, NP, to identify the patient of the event of the CC predicate, e_c. This is an event of e_m causing e_r, the result event. It follows that NP names the patient of e_r as well, given what I called the patient of causation equivalence, (339). To control R is thus to be the patient of causation.

(339) Patient of causation equivalence

If $CAUSE(e, e_m, e_r)$, then the patient of e is the patient of e_r.

So semantically, control of R coincides with being the patient of causation in English as well. And independently of this, the coincidence of patients will be stated explicitly in the semantic representation, if what I called the *causee* analysis of English CCs in section 2.9.1 of chapter 2 is correct. Then pound the cutlet flat, for instance,

will denote as in (340).

(340) $[\![\text{ pound the cutlet flat }]\!] = \lambda e \exists e_1 \exists e_2 . [\mathit{CAUSE}(e, e_1, e_2) \ \wedge \ \text{PAT}(e) = c \ \wedge$
$\mathit{pound}(e_1) = c \ \wedge \ \text{PAT}(e_1) = c \ \wedge \ \mathit{flat}(e_2) \ \wedge \ \text{PAT}(e_2) = c \ ]$

This says that the cutlet, c, is the patient of the event of causation, as well as of its means and result events.

Given this equivalence, the causer/controller disjunction can be restated as (341).

(341) If the subject of a CC identifies the patient of the event of causation, then the CC does not refer to an agent of the event of causation; and if a CC refers to an agent of causation, then the object identifies the patient of causation and the subject identifes the agent.

We can isolate two aspects of this obervation, (342a) and (342b), which echo familiar generalizations.

(342) a. When there is both an agent and a patient of causation, the agent is identified by the subject and the patient by the object; when there is only a patient, it is identified by the surface subject.

b. The agent and patient of causation are identified by distinct arguments.

(342a) repeats the common generalization that agents outrank patients on a "Thematic Hierarchy" (Gruber 1965, Fillmore 1968, Jackendoff 1972, etc.). When a predicate is related to an agent and to a patient, the agent will occupy the higher structural position.

(342b) can be related the Theta Criterion (Chomsky 1981). One part of that principle, the part I did not dismiss in chapter 1, says that a single phrase does not receive more than one θ-role from a single predicate. (343) states the main idea more neutrally, without the projectionist bias of the original formulation.

(343) Thematic Uniqueness

A single phrase is not assigned two thematic relations to the event of a predicate P, if those relations are distinctive for P.[7]

Two relations are *distinctive* for P just when P can occur with two distinct phrases, each bearing one of the two relations to the event of P.[8] Let us assume that the AG and PAT relations are distinctive for any predicate that describes a *CAUSE* event; for instance, these relations are distinctive for tī duàn 'kick snap,' because it's possible that two distinct phrases could identify the agent and patient of causation, respectively. Then (342b), the heart of the causer/controller disjunction, is a consequence of Thematic Uniqueness: a single phrase cannot identify both the agent and the patient of the event of a CC predicate. Equivalently, a single phrase cannot both identify the agent of causation and control R. Given that the agent of causation is identified by the subject, it then follows that, when the CC is agentive, the subject cannot control R.

Of course (343) must be understood within the context of a theory of reflexivity, and unmarked reflexives like Al shaved, or unmarked reciprocals like Al and Mel met

[7]Thematic Uniqueness is not the only condition governing the distribution of thematic relations. Importantly, it is also true that no phrase is assigned a thematic relation θ to an event for which θ is *not defined*. Not every thematic relation is defined for every sort of eventuality. The agent relation is not defined for states of being large, for example. Thus a predicate L meaning 'be large' will not cooccur with an argument identifying both its patient *and* its agent—not because these relations are distinctive for L and hence Thematic Uniqueness if violated—but just because there is no such thing as an agent of largeness.

[8]Jackendoff 1990 argues that a predicate P can assign several thematic relations to a single argument phrase, each one to a different subevent in the presumed structure of P's event. But these various relations would not be distinctive for P, since by hypothesis they are always conflated into one bundle of relations assigned to a single phrase.

Theories like Jackendoff's are the reason we need individuate "distinctive" relations relative to *predicates*, and not events themselves. One can be confident about what counts as one predicate. But it its always possible to analyze an event as having parts. So if Thematic Uniqueness were to say only that a single phrase cannot be assigned two relations to one event, it could be circumvented too easily. The 'one' event could be broken into two constituent subevents, with one of the two thematic relations assigned to each of them.

for lunch, will impose the usual complications.[9] But in some form another, Thematic Uniqueness is a widely accepted principle, and a plausible candidate for an axiom of universal grammar. To see the causer/controller disjunction as an instance of (343) is therefore a satisfying reduction.

Insofar as the reduction is satisfying, moreover, it supports the two assumptions that allow it: (i) the subject in a transitive CC is the agent of the event of causation, and (ii) control of R coincides with being the patient of causation. This is as the NAT has it for Igbo and Mandarin, and as it is in the causee analysis for English.

3.2.5 The DOR and the causer/controller disjunction

The DOR can be seen as observationally equivalent to the causer/controller disjunction, modulo an independent assumption. The two statements describe the same pattern in the data. But the DOR goes beyond the causer/controller disjunction in adding the presumption that nonagentive predicates, particularly nonagentive predicates of state-change, are unaccusative.

Unaccusatives are clauses where all argument phrases are generated as objects (Perlmutter 1978, Burzio 1986, Baker 1988). The surface subject of an unaccusative, if it is thematically related to the event of the predicate, is an object underlyingly.

Grammatical theories differ in whether they recognize unaccusative structures. But those that do generally agree in treating as unaccusative the intransitive member

[9]Reflexives complicate principles like (343) only under two conditions: (i) the reflexive clause is demonstrably intransitive, with only a single argument position; and (ii) the clause is *not* overtly marked as reflexive. If condition (i) is met, but the clause is marked as reflexive, we need only limit (343) to predicates not marked as reflexive (see Reinhart and Reuland 1993). If both (i) and (ii) are met, however, no such solution will be possible. Yet this complication is not likely to arise in the domain of CCs. I have been unable to find language where a CC with reflexive meaning, like 'Al pounded himself flat,' is not marked as reflexive, either by means of a reflexive pronominal object, or by verbal morphology. More than this, I have found none that are demonstrably intransitive. For discussion of verbal reflexive marking and complex causatives in a language with both, namely Kannada, see Lidz and Williams 2002, 2004, and the references there.

of a pair like (344). The transitive and the intransitive refer to an event of the same kind, but the transitive adds reference to an agent.

(344) a. The twig snapped.

b. Al snapped the twig.

If the nonagentive member of the pair is unaccusative, then the patient argument is underlyingly a direct object in both members. And correspondingly, the alignment of thematic and grammatical relations is invariant: the patient is always a direct object, and when there is an agent, it is a subject. Theoretical arguments for assuming such invariance are known from the work of Baker (1988) and others. Its attraction for any grammar with nonprojectionist components is obvious. In effect, nonprojectionism says that thematic relations are introduced by grammatical relations. The more regular the correspondence between these relations is, therefore, the simpler a nonprojectionist grammar will be.

The same principles that lead to an unaccusative analysis of (344a) lead to an unaccusative analyis of subject-control CCs, given the causer/controller disjunction. In pairs like (344) there is a complementary relation between (i) having an agent and (ii) the subject being the patient; treating the nonagentive case, (344a), as unaccusative is a way of encoding this, one which affords certain simplifications. What the the causer/controller disjunction observes is a complementary relation between (i) having an agent and (ii) the subject controlling R. So if it is advantageous to treat the nonagentive (344a) as unaccusative, it is equally advantageous to treat nonagentive CCs as unaccusative as well.

The analogy is even stronger given that control of R is coincident with being the patient of causation. As observed above, the causer/controller distinction then amounts to (345).

(345) If the subject of a CC identifies the patient of its event, then the CC does not refer to an agent of causation; and if the CC does refer to an agent of causation, then the direct object identifies the patient of its event.

This description applies equally to the alternation in (344); we need only replace "CC" in (345) with "simple clause." So if indeed controlling R means being patient of the predicate's event, then any theory which regards (344a) as unaccusative is compelled the same for subject-control CCs.

Let us then agree with this reasoning, and conclude that subject-control CCs are unaccusative. It then follows that even subject-control CCs comply with the DOR, since the surface subject is the object underlyingly.

Importantly, we reach this conclusion without making any appeal whatsoever to lexical properties of the means verb, or to particular thematic relations between the means verb and the arguments in a CC clause. Thus the conclusion applies equally to languages with or without the UPP. Igbo and Mandarin obey the DOR, just as English does. To say this is just to recognize the validity of the causer/controller disjunction in these various languages (a generalization which reduces to Thematic Uniqueness) and to agree with certain assumptions about what sorts of predicates are unaccusative. Correspondingly, if one agrees with the causer/controller disjunction, disagreement about the DOR can only be disagreement about unaccusativity. And this is an issue separate from the analysis of CCs in particular.

Finally, Mandarin sometimes provides overt evidence for the unaccusativity of nonagentive CCs. In certain cases, when the phrase that controls R is indefinite, it surfaces postverbally, (346). We can infer that this is its underlying position, in the direct object slot.

(346) cūn -lǐ bìng sǐ -le yīge rén.
village -in be ill die -PFV one person
'In the village a person died from being ill.' (Wang 1995: 157, tr. AW)

Since (346) remains nonagentive (the village is not construed as a causer), the contrast with (347) is minimal. They differ only in the surface position of the controller, and in its referential definiteness.

(347) Lǎo Wèi bìng sǐ -le.
L.W. be ill die -LE
'Lao Wei died from being ill.'

It is fair to conclude that the controller is the underlying object in both cases; both are unaccusative. Corresponding to the difference in definiteness, the object of (346) remains in situ, while that of (347) raises to subject.

3.2.6 Implementing the DOR

Given that the DOR is descriptively corrrect, let us consider its implementation. How do the structures I propose for CCs guarantee that control is by the direct object?

In Mandarin and Igbo, this is a simple consequence of the semantic content associated with the direct object position. The grammar constrains the object to identify the patient of its sister predicate. When the predicate is a complex causative, it follows that the direct object controls R, since the patient of causation is the patient of its result. No other position is assigned a patient relation, and so only the direct object can control R.

The fact that there is control of R at all, i.e. that there even is a direct object in the clause, follows from considerations discussed in chapter 2. The grammar will allow predicates with a certain feature, [O], to form a VP by combining with a DP specifier, and prevent them from forming a VP alone, with no direct object. Thus by

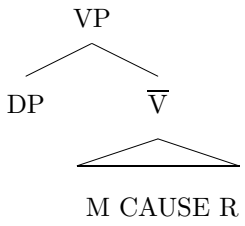
assigning [O] to CAUSE, we rule out the possibility of unergative CCs, like (348), and guarantee that the patient of causation is always identified.

(348) * Chidi bi kpụ -rụ (ebikpụ).
C. cut dull -FACT (BVC)
Intended: 'There was an event of cutting causing dullness whose agent was Chidi.'

Remember that assigning a predicate [O] does *not* mean assigning it a lexical requirement for a patient, however; see section 2.7 in chapter 2.

Similarly in English, the DOR will follow so long as we ensure that the CC complex predicate necessarily occurs in a VP that contains a direct object. Any complex causative VP must have the structure in (349).

(349)



Take the example of pound flat. If the *simple* analysis of English is correct, pound flat denotes as in (350); (351) gives its denotation if the *causee* analysis is correct.

(350) $[\![\text{ pound flat }]\!] = \lambda y \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge pound(e_1) \wedge \text{PAT}(e_1) = y \wedge flat(e_2) \wedge \text{PAT}(e_2) = y \dots]$

(351) $[\![\text{ pound flat }]\!] = \lambda y \lambda e \exists e_1 \exists e_2 . [CAUSE(e, e_1, e_2) \wedge \text{PAT}(e) = y \wedge pound(e_1) \wedge \text{PAT}(e_1) = y \wedge flat(e_2) \wedge \text{PAT}(e_2) = y \dots]$

Either way, when pound flat occurs in the VP of (349), it will combine by function application with the DP in its specifier, and the result will be that the direct object controls R.

But on what grounds can the required structure in (349) be motivated? It cannot follow from a requirement of the verb in M, since that verb may, like shout in shout

hoarse, have no need for a local (internal) argument. I hesitate to have it follow from a requirement of R. In English R may be an AP. APs have no general need to be predicated of a DP; the AP very flat is not predicated of any DP in the very flat cutlet. And even when an AP serves as the main predicate of a clause (as in the cutlet is flat), it is not at all clear that the subject of which it predicates is generated internally to the VP. What forces the presence of an object DP in a complex causative VP must therefore be the causative meaning itself, or some feature of the presumed CAUSE head that introduces it.

If we accept the causee analysis, the presence of the object can be linked to CAUSE's lexical requirement for a patient. Any such requirement is subject to a locality condition: it must be satisified within some minimal domain. If the relevant domain here is VP, then the presence of the object in (349) follows. The choice of VP can perhaps be motivated by regarding CAUSE as a *verbal* head, either a V or a v, and treating its patient argument as an *internal* argument. Then (349) follows from a general requirement to saturate all internal arguments of a verbal predicate within VP.

In effect, this is the projectionist reflex of the same principles that force CC predicates in Igbo and Mandarin to occupy a VP with a direct object. In both cases, the fact that the CC predicate cooccurs with an object reflects a semantic fact about the CAUSE head: it describes a type of event, a *CAUSE* event, that has a patient. In Mandarin and Igbo, this motivates the assignment of a formal feature [O]. But in these languages, principles relating the occurrence of a thematic relation (or relatum) to the meaning of a predicate are stated, not over individual verb roots, but maximal VP predicates. So a head with [O] is not also assigned a patient as a lexical argument. But in English, the principles that relate argument structure to meaning are lexical; they are imposed on individual verbal heads. So because CAUSE

describes an event with a patient, it is assigned a patient as a lexical argument. And on general grounds, this argument must be discharged within VP. Generalizing over both sorts of languages, then, we can say this. The patient of a *CAUSE* event is always identified. In English it is identified by the direct object because the CAUSE head has a patient as an internal lexical argument. And in Igbo or Mandarin, it is identified by the direct object because direct objects are interpreted as patients.

It is interesting to connect this with a hypothesis in Embick 2004. Embick uses similar reasoning to explain the restriction noted in note 5 of chapter 1. In English, R can contain neither verbs (352b) nor participles derived from them (352c) (see Green 1972).

(352) a. Al pounded the cutlet flat.

b. * Al pounded the cutlet flatten.

c. * Al pounded the cutlet flattened.

For Embick, the morpheme that derives flatten from flat is a head of category v called v[FIENT]. In this context, v[FIENT] has essentially the meaning that Parsons (1990) assigns his "BECOME." Embick proposes that the root with which v[FIENT] combines "must be predicated of a DP in [its] specifier" (Embick 2004: 378). That is, (i) the combination of v[FIENT] and, say, flat, must combine immediately with a DP specifier; and (ii) the DP specifier identifies the patient of the state-change described by its sister predicate, [v[FIENT] flat], pronounced flatten.[10] This restriction—v[FIENT] must combine immediately with a DP which identifies the patient of its event of state-change—is analogous to the restriction just described for CAUSE.

[10]Recall Parson's postulate: "The Theme of [BECOME's] event is the same as the Theme of its Target state" (Parsons 1990: 119). Embick's v[FIENT] has the semantics of Parsons's BECOME; it describes a BECOME event, one whose "Target state" is specified by the stative root with which it combines. Thus when that root is "predicated of a DP in [v[FIENT]'s] specifier," the DP identifies the "Theme" of the BECOME event. What Parsons calls "Theme," I call "patient," and so a DP in the specifier of Embick's v[FIENT] identifies the patient of its event.

The relevance for (352) is this. The verb flatten and its participle both include v[FIENT] in their structure. Thus they must combine immediately with a DP identifying what flattens. But the CAUSE head itself requires a DP, identifying the patient of the event of causation, i.e. the event of pounding causing flattening.[11] So the verb phrases in (352b) and (352c) would have to contain *two* object noun phrases, (353).

(353) * Al pounded [$_{DP_1}$ the cutlet] DP_2 flatten(ed).

Patently, no overt DP can occur in the position of DP_2. And Embick presumes, conservatively, that there is no silent anaphor that could do so either. Hence (353), the structure required by the use of the state-change verb in R, is ungrammatical.

3.2.7 The DOR cross-linguistically

It is a good bet that the DOR, correctly understood, is valid universally. In any CC construction, if the subject is understood as the causer, control is by the surface object, and control is by the surface surface subject only if there is no reference to an agent of causation.

Surveying the literature on complex causatives and serial verbs, one is impressed by the absence of examples that would violate this generalization, like (354).

(354) * Rocky's fists pounded the frozen beef bloody.
Intended: 'Rocky's fists made themselves bloody by their pounding the frozen beef.'

Nor does this fact go unnoticed; the DOR is often recognized explicitly. In fact, object-control is often regarded as a *definitive* feature of complex predicates with causative meaning. A complex predicate expresses a causative relation between the

[11] For Embick, this head is also v[FIENT]. But here, in effect, the head introduces the *CAUSE* relation, rather than BECOME; Embick refers to the inter-event *CAUSE* relation as "*BY*." See Embick 2004: 367–377 for details.

events of its primary and secondary predicates only if the secondary predicate is controlled by the object.

Stewart (2001), for example, divides Edo serial verb constructions (SVCs) into three types, each expressing a different semantic relation between the component predicates: causation, sequence, or simply conjunction. He calls these "resultative SVCs," "consequential SVCs," and "covert coordinations," respectively. The semantic distinction is matched by one in the syntax of control. Causative SVCs require an intransitive second verb, controlled by the direct object. But the others have transitive second verbs, controlled by the subject.

Solnit (1997) observes a similar contrast in Kayah Li, a Tibeto-Burman language of the Karen branch. He writes that "[i]n the normal case," for compounds of two verbs where the semantic relation between their events is causation, "the change of state named by the second verb is undergone by the first verb's Undergoer" (Solnit 1997: 69). In the normal case it is also true that "the first verb's Undergoer" is identified by the direct object of the clause. And so causative verb compounds are governed by the DOR. In contrast, for compounds which Solnit calls "Sequential," where the semantic relation is not causation but sequence, "[t]he essential feature [...] is the mapping of the Actor argument of V1" (Solnit 1997: 82). That is, the second verb is controlled by the "Actor argument of V1," which is normally identified by the subject of the clause, contra the DOR.

Carol Lord, in her account of Igbo verb compounds, likewise identifies causative semantics with object control (1975: 28), and treats subject-control compounds as non-causative.[12] Kuhn makes the same observation for Vietnamese, as does Crowley

[12]Lord writes: "If we give the compound a causative interpretation (i.e. interpret it as meeting condition (ii) in rule 5 [...])." (1975: 28). A compound meets condition (ii) of rule 5 when the logical object of the first verb is the logical subject of the second verb. In the context of Lord's discussion, this amounts to saying that a compound meets condition (ii) when the direct object of the clause controls R. Lord considers only data where the logical object of the M is identified by

for the Oceanic language Paamese.

> Wenn das Folgeverb einer Serie nicht das Subjekt, sondern das Objekt des vorangehenden Verbs aufnimmt, liegt ein kausatives verhältniss zwischen erstem und zweitem Junct vor. (Kuhn 1990: 275) ['When the second verb of a series takes up not the subject, but the object, of the first verb, then there is a causative relation between the first and the second verb.']

> Such constructions [where the logical subject of the second verb is the logical object of the first] will be referred to [...] as switch-subject serial verbs, or as serial causative verbs, after the nature of the semantic relation that holds between the two. (Crowley 1987: 39)

In some cases, such assertions fail to distinguish between causativity and agentivity. A complex predicate is causative when the relation between the events of its two predicates is causation; it is agentive when it refers to an agent of its event. Absent this distinction, the claim that complex predicates with subject-control are not causative may conflate two distinct observations: (i) such predicates are not causative, or (ii) while causative, they are not agentive. Yet both claims represent aspects of the DOR. The DOR regulates only complex causatives, hence observation (i), and allows subject-control only to CCs that are nonagentive, hence observation (ii). Even authors who confound causativity and agentivity under the single term 'causative' are still correct, therefore, when they say that subject-control is indicative of a predicate that is, in their terms, 'not causative.' They are recognizing the validity of the DOR.

That descriptions of CCs in such diverse languages should agree so substantially provides one final motive to accept the DOR, and thus to defend it against any data which may at first appear to contradict it.

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the direct object of the clause. And being the logical subject of the second verb of course means controlling R.

3.2.8 Spurious CCs

Wechsler 1997 calls attention to a class of data which can seem to falsify the DOR (see also Verspoor 1997). Wechsler contends that the sentences in (355) and (356) have the same structure as Al pounded the cutlet flat or The lake froze solid. All are "resultatives," or what I call complex causatives.

(355) a. John swam *across the pool*. (Levin and Rapaport Hovav 1995)

b. She danced *free of her captors*. (ibid)

(356) a. The wise men followed the star *out of Bethlehem*.
(Wechsler 1997: 313)

b. The sailors rode the breeze *clear of the rocks*. (ibid)

c. He followed Lassie *free of his captors*. (ibid)

At first glance, it is not implausible to regard these as CCs. Like English CCs, they comprise a verb and a nonverbal predicate, with no overt marking of the relation between their meanings. It is moreover possible to paraphrase these examples in the same way that we might paraphrase CCs. In both cases, the event of the second predicate can be said to follow as a result of the event of the first, (357b) and (358b).

(357) a. Al pounded the cutlet flat.

b. The cutlet is flat as a result of Al pounding it.

(358) a. The wise men followed the star out of Bethlehem.

b. The wise men are out of Bethlehem as a result of them following the star.

But if these are CCs, the DOR cannot be valid. In each of the examples it is the surface subject that controls the putative R predicate, here in italics. John winds up

being across the pool, the wise men wind up out of Bethlehem, and so forth. Yet the verbs allegedly in M are presumably agentive, and not unaccusative;[13] certainly this is true of the transitive verbs in (356). In simple sentences agents are expressed by (underlying) subjects. Given the UPP, an argument constrained to identify the agent of M must be an (underlying) subject in a CC as well. And so the surface subjects in (355) and (356) are also the underlying subjects of their clauses. If these clauses are CCs, therefore, they violate the DOR. Rappaport Hovav and Levin (2001) concede Weschler's observations and consequently choose to abandon the DOR entirely.

But there are good reasons to doubt that Wechsler's sentences are in fact CCs.

First, it is significant that they are all complex predicates of directed motion. They describe the type (or manner) of motion in their first part and the goal in the second. In some languages, the syntax of this class is plainly distinct from that of complex causatives. Ambae, an Oceanic language of Vanuatu described in Hyslop 2001, is one clear example. Complex causatives in Ambae take only a single marking of modality and agreement (here in italics) for the entire complex predicate, (359). But complex predicates of directed motion, like Wechsler's, require separate marking for each verb, (360) and (361).

(359) *da=mo* tai visa na avi.
1.ns.incl.S=REALIS chop split ACC firewood
'We split the firewood by chopping it.' (ex. & tr. Hyslop 2001: 320)

(360) *no=mo* dige *no=mo* vano Longana.
1sS=REALIS walk 1sS=REALIS go L.
'I walked to Longana.' (ex. & tr. Hyslop 2001: 295)

[13]Levin and Rappaport Hovav 1995 proposed that the verbs in (355) are optionally unaccusative, allowing these examples to conform to the DOR. This fix was never compelling, however, since the evidence that these verbs occur as unaccusative outside the context of a CC is extremely thin; see Verspoor 1997.

(361) *mo* garu-geru *mo* hivo.
[3sS].REALIS REDUP:swim [3sS].REALIS go.down
'S/he swam out to sea.' (ex. & tr. Hyslop 2001: 279)

It is therefore plausible to suppose that these are two separate classes in English as well, whatever their similarities.

Direct evidence for a structural difference in English comes from facts about the placement of adverbs. Recall from section 2.9.2 of chapter 2 that, in uncontroversial CCs, even those where R is a PP, an adverb that intervenes between the direct object and R cannot describe the means event, or the event of causation as a whole. The only natural construal is with R. (362) and (363) are two of the examples I used to establish this.

(362) # Al wiped the tabletops frantically dry.
Contrast: Al (frantically) wiped the tabletops dry (frantically).

(363) # Al beat the intruder frantically to death.
Contrast: Al (frantically) beat the intruder to death (frantically).

But complex predicates of Wechsler's sort behave differently, (364).

(364) a. The wise men followed the star faithfully to Bethlehem.

b. John swam frantically across the pool.

Here construal of the adverb with the verb of motion is entirely reasonable, while construal with the PP is implausible. The adverb describes either the event of the verb alone or the entire complex event of movement; it does not describe the path of the PP. Thus the structure of Wechsler's sentences is distinct from that of a normal CC.

Finally there is a hint of a semantic contrast, developed by Rappaport Hovav and Levin (2001) themselves. They examine minimal pairs like (365a) and (365b). The

first is a sentence of the sort Wechsler discusses: the subject controls the secondary predicate despite the first predicate being agentive. The second is an uncontroversial CC, with object control of R. In the subject-control case, they find, the achievement of the result state proceeds temporally in lockstep with action of the main verb; but in the object-control case, (365b), this is not necessary.

(365) a. Mary wriggled free of her captors.

b. Mary wriggled herself free of her captors.

(365a) describes a continuous motion of breaking free, the whole motion one of wriggling. Thus it would misrepresent a scene where the achievement of freedom is quite disjoint from the wriggling. (365b) is different. Suppose that Mary's wriggling breaks the straps that hold her, but she waits a minute to leap to freedom. (365b) could describe this scene, but (365a) could not. Rappaport Hovav and Levin take the possibility of a time lag between a result and the means of its achievement to be aspect of causative semantics. Thus object-control cases like (365b) are "causative" while subject-control complex predicates are not.

There is thus enough evidence to regard Wechsler's sentences as instantiating a construction distinct from the complex causative. The fact that this construction is not described by the DOR is interesting, but not relevant to the grammar of CCs. Of course Wechsler's sentences deserve an analysis. But if I am right, their correct analysis will surely build on their directed motion semantics, and on the semantics of PPs that describe a bounded path (see Rothstein 2004: 87–88, and the references there). It will not reduce to an account of complex causative structure.

Rappaport Hovav and Levin (2001) reason differently. Despite arguing that Wechsler's sentences are "not causative," they continue to count them as "resultatives," along with normal CCs. Worse, they continue to presume that the domain of the

DOR ought to be the class of all "resultatives," causative or not. And consequently that the DOR is falsified, since the "non-causative resultatives" do not obey it.

This leaves Rappaport Hovav and Levin asking why the "causative resultatives" *are* correctly described by the DOR. The answer they give is unsatisfactory for two reasons. First, it gives two separate and unrelated explanations for object-control in "causative resultatives" (i.e. CCs): one for when the means verb is transitive and one for when it is transitive. All else equal, a unified explanation should be preferred.

Second, their account for CCs with transitive means verb is contradicted by languages like Igbo and Mandarin, which lack the UPP. Dealing just with languages that have the UPP, like English, Rappaport Hovav and Levin reason as follows:

(i) Due to the meaning of causation, the result eventuality is constrained to specify further an effect on the "force recipient" of the means event (see also Levin and Rappaport 1995, Wechsler 1997, and Rothstein 2001: 158).

(ii) We can tell what the "force recipient" of the means event is by putting the M verb in a simple clause. The "force recipient" of its event is the thematic relatum identified by the direct object in that clause. In brief, it is the canonical patient of the means verb.

(iii) Therefore, control of R must be by the argument that identifies the patient of the means event.

Since the presumption of the UPP allows premise (iv) below, they can then derive from (iii) the final conclusion in (v), partly recapturing the DOR.

(iv) When the verb in M is transitive, its patient will be identified by the direct object of the CC clause (i.e. English has the UPP).

(v) And therefore, when the verb in M is transitive, the direct object of the CC clause will control R.

The two main premises of this argument, (i) and (ii), are presented as if they follow from general principles of semantics, or if you like, cognition. But, at least jointly, they are not true. We have seen data in Igbo and Mandarin that falsify them directly. Even when M is a transitive verb, the noun phrase that controls R need not be interpreted as the patient of the means event. It may be the instrument, for example, or even the agent. Yet control is by the direct object regardless. Perhaps things are different in English. But then Rappaport Hovav and Levin cannot suggest, as indeed they do, that their explanation draws on semantic (or cognitive) principles of universal breadth.

It is therefore best to exclude Wechsler's sentences from the class of constructions described by the DOR. The DOR governs just CCs, or what Rappaport Hovav and Levin (2001) call the causative resultatives. Wechsler's sentences are demonstrably distinct from CCs in syntax and in meaning. And by removing them from the domain of the DOR, we sustain a generalization that is well motivated both in fact and in theory. The DOR is supported in a wide range of languages. And this is not surprising, if indeed it derives from the basic principle that a single phrase cannot identify both the agent and the patient of a single predicate.

3.2.9 Final comments on the DOR

Theories of control in CCs have often appealed to the thematic relation between the controller of R and the verb in M. This is the basis of the theory in Rappaport Hovav and Levin 2001, for example; and, if the reader is not careful, Levin and Rappaport Hovav 1995 can seem to say that the lake controls R in the lake froze solid because

it identifies the patient of freezing. Yet it has been clear all along that the relation to M is irrelevant; this is the lesson of CCs like Al shouted his throat hoarse. Still, there has been a tendency to treat such cases, where the direct object does not name the patient of M's event, as special. What Mandarin and Igbo teach us, with clarity afforded by their lack of the UPP, is that these cases are not special. They are normal, and for this reason. The phrase that controls R identifies the patient of causation, the event of causation is the event of the CC predicate, and the patient of a VP's event is realized by its direct object. Recognizing this both simplifies the theory of control, and allows it to be uniform across languages—attractive results that are otherwise unavailable.

3.3 Intransitive CCs and the NAT

This section supports the NAT with data from intransitive CCs.[14] Intransitives reinforce the conclusion from chapter 2 that patients are typically not arguments of the verb in Igbo or Mandarin. As expected given the conclusions of section 3.2, the interpretation of the surface subject in an intransitive shows the same freedom of interpretation with respect to M as does the surface object in a transitive. Intransitives also provide new and stronger evidence against a simple projectionist model for agents. Verbs that must cooccur with an agent in simple clauses routinely occur in intransitive CCs without one. To account for this, we need a nonprojectionist theory, and one where the distribution of agents is stated in part over larger structures, VP predicates, rather than individual verbs. Importantly, the leading alternative to the NAT, which postulates valence-reducing operations in the formation of a CC, is

[14]Much of the Igbo material in sections 3.3 and 3.4 of this chapter was presented as "Intransitive resultatives and Igbo" at the 76th Annual Meeting of Linguistic Society of America at Boston, January 2004.

disproven directly by the behavior of intransitive CCs in Igbo.

As usual, I will start by reviewing the facts of English, where intransitive CCs again indicate the UPP.

3.3.1 Uniform projection in English intransitive CCs

In principle, an intransitive CC might have one of two parses, the unaccusative or the unergative. The former treats the surface subject as an object underlyingly, but the latter does not. Consider (366). Its unaccusative parse has the lake generated in the same position it occupies in (367). But the unergative parse would put the lake in the same basic position that Neptune has in the transitive.

(366) The lake froze solid.

(367) Neptune froze the lake solid.

(366) is grammatical, but only under the unaccusative parse. Under the unergative parse, it violates (at least) the DOR. The same comments apply to (368) and (370). As unergatives, they violate the DOR, but as unaccusatives, they do not.

(368) * His throat shouted hoarse.

(369) Al shouted his throat hoarse.

(370) * The cutlet pounded flat.

(371) Al pounded the cutlet flat.

Then why are (368) and (370) ungrammatical, if they have a parse that complies with the DOR?

The pattern of grammaticality in CCs matches the pattern in simple clauses. In simple clauses, freeze is fine without an agent, (372). But shout and pound are not, (373,374). The agents of shouting and pounding must be identified.

(372) The lake froze.

(373) * There/it_{expl} shouted.
Intended: 'There was an event of shouting.'

(374) * The cutlet pounded.
Intended: 'There was event of pounding the cutlet.'

Thus the English verbs show uniform projection, expressing the same requirements in CCs as in simple clauses.

As usual, uniform projection can be explained by assigning the verb a lexical argument. If shout and pound have a lexical requirement for an agent, it explains why they always occur with an agent, whether in simple clauses or CCs. If freeze has no such requirement, it explains why it can occur without an agent, in any context. Exactly this conclusion is drawn in Levin and Rappaport 1995.

Of course uniform projection in English intransitive CCs is not limited to agents. If a verb requires a patient in simple clauses, it also requires one in intransitive CC. But seeing this takes some imagination. Take the verb swing. In (375) it occurs with a surface subject that identifies its patient (or theme). Removing the patient results in ungrammaticality, (376).

(375) The barn door swung (in the autumn winds).

(376) * There/it_{expl} swung.
Intended: 'There was an event of swinging.'

The same is true when swing occurs in M. It's fine when its patient is identified, (377), but not otherwise, (378).

(377) The barn door swung shut.

(378) * The barn door's hinges swung smooth.
Intended: 'The hinges got smooth from [the barn door] swinging.'

Putting it differently, the surface subject (and underlying object) of an intransitive CC with the means verb swing is constrained to identify the patient of swinging. Because this is not true in (378) (when a door swings, its hinges don't) the sentence is ungrammatical.

3.3.2 The lack of uniform projection in Mandarin and Igbo

Mandarin verbs in intransitive CCs

M in the Mandarin (379) is káng 'carry.' In simple clauses this verb occurs with a subject naming the agent of carrying and an object naming what is carried, (380). Both arguments are required. (381) is ungrammatical unless we assume a silent object pronoun, and (382) is ungrammatical unless we assume a silent subject pronoun.

(379) jiānbǎng káng zhǒng -le.
shoulder carry swollen -LE
'[My] shoulders got swollen from carrying.' (Ma 1987: 424; tr. AW)

(380) Lǎo Wèi káng -le mádài.
L.W. carry -PFV sack
'Lao Wei carried a sack.'

(381) * Lǎo Wèi káng -le.
L.W. carry -PFV
Intended: 'There was an event of carrying, with Lao Wei the agent.'
Can mean: 'He carried *pro*.'

(382) * mádài káng -le.
sack carry -PFV
Intended: 'There was an event of carrying with the sack the patient.'
Can mean: 'The sack, *pro* carried.'

Yet the sole argument noun phrase in (379), jiānbǎng 'shoulders,' is understood neither as the agent nor as the patient of the means event. Perhaps we can say it identifies the

instrument of that event. But whatever thematic relation it has, this is not a relation that can be associated with an argument position in simple clauses with káng 'carry.' (383a) and (383b) are ungrammatical. And while (383c) is marginally possible, it depicts the shoulders as the agent of carrying, not merely the instrument; this results in a sense of metonymy or personification that is entirely absent from (379).[15]

(383) a. * tā káng -le jiānbǎng.
3s carry -LE shoulders
Intended: 'He carried [stuff] with his shoulders.'

b. * tā káng -le (jiānbǎng) mádài (jiānbǎng).
3s carry -PFV (shoulders) sack (shoulders)
Intended: 'He carried the sack with his shoulders.'

c. ? tā jiānbǎng káng -le mádài.
3s shoulder carry -PFV sack
'His shoulders carried the sack.'

Thus in (379), káng 'carry' occurs without entering either relation that is required in simple clauses, neither the patient nor the agent—demonstrating the lack of the UPP quite dramatically.

The same sorts of observations apply to (384), whose predicate is familiar from chapter 2. In simple clauses with qiē 'cut,' the agent and patient of cutting must be identified by argument NPs, and no argument NP can be interpreted simply as the instrument. None of these constraints hold in (384).

(384) càidao qiē dùn -le.
food knife cut dull -PFV
'The cleaver got dull from cutting.' (Ma 1987: 424, tr. AW)

[15] I should note that the verb káng means 'to carry on the shoulders.' But everything I say about káng applies equally to tái, which means 'to lift' or 'to carry' simply. I choose to use the examples with káng only because these data were published in a source that has been available for a fairly long time.

(385) is a similar case involving a basically *in*transitive verb.

(385) tā -de shēntǐ lèi kuǎ -le.
3s -NMOD health tired collapse -LE
'His health gave in from overwork.' (ex. & tr. Wu et al. 1986: 261).

M here is lèi 'be tired.' The sentence says that someone's health collapsed as a result of his exhaustion. But no *argument* NP in the clause identifies the patient of this exhaustion. The only argument is tā-de shēntǐ 'his health,' and this is not an acceptable patient for the verb lèi 'be tired,' (386a). More importantly, whatever bizarre meaning (386a) may have is no part of the meaning of (385).

(386) a. # tā -de shēntǐ lèi -le.
3s -NMOD health be tired -LE
#'His health is tired.'

b. tā lèi -le.
3s be tired -LE
'S/he is tired.'

Thus lèi occurs in (385) without entering the sole thematic relation it must enter in simple clauses like (386b).

The *understood* thematic relation between M and the surface subject is not necessarily fixed, moreover, by the choice of verb. (387–389) all have xǐ 'wash' in M. Yet the understood relation between the subject and M differs in the three cases. The subject is naturally construed as the agent in (387), the patient in (388), and a peripheral bystander in (389).

(387) yīfu xǐ gānjing -le.
clothes wash clean -LE
Intended: 'The clothes got clean from washing [i.e. being washed].'

(388) Xiao Wang xǐ leì -le.
X.W. wash tired -LE
Intended: 'Young Wang got tired from [his] washing [stuff].'
(Ma 1987: 424; tr. AW)

(389) xíe xǐ shī -le.
shoe wash wet -LE
Intended: 'My shoes got wet from [my] washing [stuff].' (Ma 1987: 424)
Can also mean: 'The shoes got wet from being washed.'

Likewise, corresponding to (384) and (385) for example, we can construct intransitive CCs where the subject *is* understood as the patient of the means event.

(390) dùzi qiē kāi -le.
abdomen cut open -LE
'The gut got opened from cutting.'

(391) tā lèi bìng -le.
3s tired be ill -LE
'S/he got ill from being tired.'

When a certain interpretation is dominant, therefore, we must assume that the preference is not mandated by the grammar. Rather it results from real-world knowledge concerning events of the type described by the predicate, combined in some measure with conventions of usage.

These facts go against a well-known idea from Y. Li 1990, 1995. Li claims that, in subject-control CCs (but not in object-control CCs) thematic relations to the means verb are fixed; they match the pattern of relations which one finds in simple clauses with the same verb. In particular, suggests Li, a verb that finds an agent in the subject of a simple clause will do the same when serving as the means verb in a subject-control CC. Yet sentences like (379), (384), and (389) show that this is wrong. There are some cases where Li's observation seems reasonable, but I defer discussion of these to section 3.3.5.

Thus intransitive CCs provide the same sort of evidence for the NAT as do transitives. Mandarin verbs are not required to enter the same dependencies when in M as when heading a simple clause. Moreover, interpretation with respect to M is in principle unrestricted. Thus the argument dependencies manifested in simple clauses do not project from the verb. Lexically, the verb has no arguments.

Before proceeding to Igbo, I want to dwell briefly on my analysis sentences like (392) and (393), the sort of CC which can make Mandarin seem like it flouts the DOR.

(392) Lǎo Wèi zǒu fá -le.
L.W. walk weary -LE
'Lao Wei got weary from walking.'

(393) Lǎo Wèi hē zuì -le.
L.W. drink drunk -PFV
'Lao Wei got drunk from drinking.'

Here the subject is understood as identifying the agent of the means event. But my claim is, this construal is not forced by the grammar. The semantics says only that Lao Wei is the patient of a certain event of causation. That he is furthermore the agent of its means event is just something we presume, because it explains how Lao Wei could get tired from the walking or drunk from the drinking.

For me this is the only possible analysis, given the premise that these sentences are CCs. I assume that all CCs obey the DOR. Hence Lǎo Wèi in (392) and (393) is the direct object underlyingly. I also assume that, if a verb has an agent as a lexical argument, it must assign that argument to an underlying subject (this is, so to speak, a Thematic Hierarchy effect). Consequently, if it were the case that the surface subjects in (392) and (393) instantiated a lexical argument of the means verb, they would have to be subjects underlyingly as well. But then (392) and (393) could

not be CCs, because they would violate the DOR.

Thus I make a general prediction. For any CC in any language, if the subject controls R and is also construed as the agent of the means event, the verb in M must not have an agent as a lexical argument. Based on Lisu[16] (394) and Yoruba (395), therefore, I infer that this is the case with the verbs meaning 'drink' in these languages, Lisu do^{33} and Yoruba mu.

(394) e^{55} ʤi^{33} phɯ^{31} do^{33} ʒi^{42} le^{33} ua^{44}.
3s wine drink drunk PFV PRT
'S/he got drunk from drinking wine.'
(Xu, Mu, and Gai 1986: 92, tr. AW)

(395) Wón mu otí yó.
they drink wine drunk
'They are drunk.' (ex. & tr. Bamgboṣe 1974)

And should this conclusion be proven incorrect, I would have to deduce that these sentences are not CCs, at least not normal ones. (Notice that (394) and (395) include an object NP meaning 'wine'; I discuss the analysis of such objects in section 3.3.5.)

For Mandarin, the premise that sentences like (392) and (393) are indeed CCs is standard in the literature. Yet on comparative grounds, it would not be outrageous to claim that they aren't. In some Sinitic languages, meanings equivalent to those of (392) and (393) are expressed with a construction syntactically distinct from what is used to express (e.g.) 'pound flat' (Larmarre 2001, Yue 2001). I will continue to presume that these Mandarin sentences are CCs, since here the syntactic evidence for a difference is absent. But some caution is warranted, in Mandarin and elsewhere.

[16]Lisu, like Lahu (Matisoff 1969), is a Central Yiish (i.e. Central Loloish) language in the Southeastern group of the Tibeto-Burman family. Like all Yiish languages, Lisu is OV. The superscripted numbers in the transcription indicate tone contours.

The source from which I take Lisu (394) is a reference grammar written in Mandarin. Whenever I cite non-Mandarin sentences from Mandarin sources, my English gloss translates the Mandarin gloss in the source. So here, "tr. AW" means 'translation *from the Mandarin gloss* by me.'

One should be aware of the possibility that the grammar of these sentences is distinct from that of the typical CC.

Igbo verbs in intransitive CCs

Transitive CCs like those in (396) and (397) showed in chapter 2 that Igbo verbs typically do not have patients as lexical arguments. The verb in M is one that, in simple clauses, always occurs with a direct object that identifies the patient of its event. But in CCs the direct object is not so constrained. In (396) and (397), for example, it is interpreted as the instrument of the means event, and not as its patient. So the verb in M does not enter a thematic relation that must enter in simple clauses.

(396) Obi bi kpụ -rụ mma (n' osisi).
O. cut dull -FACT knife (P wood)
'Obi made the knife dull by cutting (wood).'

(397) Obi gwu ji -ri ọgụ (na ji).
O. dig out snap -FACT hoe (P yam)
'Obi made his hoe snap by digging out (yams).'

(398) and (399) show that the same is true in intransitive CCs. As expected if it is the direct object underlyingly, the surface subject is not constrained to name the patient of the means event. Here it identifies the instrument instead. And correspondingly, the verbs in M do not enter the patient relation that they must enter in simple clauses.

(398) Mma ahụ bi kpụ -rụ ebikpụ.
knife that cut dull -FACT BVC
'That knife got blunt from cutting.'

(399) Ọgụ ya gwu ji -ri egwuji.
hoe 3s dig out snap -FACT BVC
'His hoe got snapped from digging out.'

Because of this, subject-control CCs can often be understood in more than one way, depending on the presumed relation between the subject and M. The sentences in (400) and (401), for example, each have two clear meanings, differing in whether the subject is understood as the instrument or the patient of the means event.

(400) Osisi m sọ ji -ri asọji.
wood 1sPOSS poke snap -FACT BVC
'My stick got snapped from poking [it/something with it].'

(401) Ọba ahụ tụ pu -ru atụpu.
gourd that throw have a hole -FACT BVC
'The gourd got a hole in it from throwing [it/something at it].'

Compare the transitives below, which exhibit the same freedom in the interpretation of their object NPs.

(402) Obi sọ ji -ri osisi.
O. poke snap -FACT wood
'Obi made the stick snap by poking [it/something with it].'

(403) Obi tụ pu -ru ọba ahụ.
O. throw have a hole -FACT gourd that
'Obi made the gourd have a hole in it by throwing [it/something at it].'

Thus subject-control CCs reinforce our conclusion that patients are typically not lexical arguments in Igbo.

They also argue very clearly against a uniformly projectionist model for agents in Igbo, a point on which the transitive data are obscure. Consider (404), the intransitive counterpart to (405).

(404) Ọba a kụ wa -ra akụwa.
gourd this strike split -FACT BVC
'This gourd got split from striking.' (ex. Hale et al. 1995: 84, tr. AW)

(405) Eze kụ wa -ra ọba.
E. strike split -FACT gourd
'Eze made the gourd split by striking.' (ex. Hale et al. 1995: 84, tr. AW)

No argument in (404) identifies the agent of the means event, the event of striking (Nwachukwu 1987, Hale et al. 1995). Yet the means verb, kụ 'strike,' is one that, in simple clauses, cannot occur without an agent, (406).

(406) a. Ọ kụ -rụ ọba ahụ.
3sS strike -FACT gourd that
'It struck that gourd.'

b. * Ọba ahụ kụ -rụ (akụ).
gourd that strike -FACT (BVC)
Intended: 'That gourd underwent an event of striking.'

Kụ 'strike' is thus like English pound in always occuring with an agent argument when in simple clauses. But unlike pound, it is happy in an intransitive CC, even without an agent.

The same comments apply to the all of the examples given earlier in this section: (398), (399), (400) and (401). None of the verbs in M—bi 'cut,' gwu 'dig out,' sọ 'poke,' and tụ 'throw'—can occur in a simple clause without an argument identifying an agent for their event. Yet they are under no such obligation in the context of an intransitive CC. So in all of these cases, we should conclude that the verbs do not have an agent as a lexical argument.

Given this, it surprises me to have found in Igbo no clear examples like Mandarin zǒu fá 'walk weary' and hē zuì 'drink drunk,' intransitive CCs whose surface subject

is construed as the agent of M. This seems to indicate the same gap that I noted in section 2.3.3 of chapter 2: I found no *transitive* CCs whose *object* names the agent of M. Evidently in Igbo, the patient of causation is never interpreted as the agent of the means event. I hope future work will clarify the nature and relevance of this exception to the more general pattern.

3.3.3 Against valence-reducing operations in Igbo CCs

The facts of section 3.3.2 show once again, and sometimes more clearly than before, that Mandarin and Igbo lack the UPP. In these languages, unlike in English, we cannot account for CCs simply by assuming that they inherit their grammar from the means verb, end of story. Following a now familiar rationale, I conclude that this supports the no argument theory for Mandarin and Igbo.

In section 2.5 of chapter 2, I mentioned what I think is the best alternative to the NAT. This was the idea that, in cases where we don't see uniform projection, CC structure somehow suppresses or deletes the lexical argument(s) of the means verb. One suggested implementation of the idea was (407).

(407) $[\![\ \text{M R}\ ]\!] = \lambda y \lambda e \exists z_1 \{\exists z_2\} \exists e_1 \exists e_2 .[CAUSE(e, e_1, e_2) \wedge [\![\text{M}]\!](z_1)\{(z_2)\}(e_1)\ \wedge [\![\text{R}]\!](y)(e_2)\ ]$

Here the construction of a complex causative predicate imposes existential binding on the lexical arguments of the means verb, in effect building passivization and/or antipassivization into the structure of a CC.

In chapter 2 I argued against (407) on grounds of simplicity: there is no independent evidence for the valence reducing operation(s) it posits. But now a more direct attack is available. A plain fact about Igbo shows that the alternative represented by (407) cannot be correct.

Some CC predicates in Igbo do require an agent, owing to the choice of M. (408) is a transitive CC where M is zọ ‘tread on’ and R is wa ‘split.’ It differs from (409) only in M, which in the latter is kụ ‘strike.’

(408) Eze zọ wa -ra ọba.
E. tread on split -FACT gourd
‘Eze made the gourd split by treading.’ (Hale et al. 1995: 84, tr. AW)

(409) Eze kụ wa -ra ọba.
E. strike split -FACT gourd
‘Eze made the gourd split by striking.’ (Hale et al. 1995: 84, tr. AW)

Yet kụ wa ‘strike split’ can be intransitive, as we saw above and see again in (411), while zọ wa ‘tread split’ cannot be, (410).

(410) * Ọba a zọ wa -ra azọwa.
gourd this tread on split -FACT BVC
Intended: ‘This gourd got split from treading.’
(Hale et al. 1995:85, tr. AW)

(411) Ọba a kụ wa -ra akụwa.
gourd this strike split -FACT BVC
‘This gourd got split from striking.’ (ex. Hale et al. 1995: 84, tr. AW)

The evident source of (410)’s ungrammaticality is the verb in M, zọ ‘tread on,’ since this is its only point of difference from (411).

This means that there is nothing about the CC construction itself that systematically suppresses requirements for an agent (granting for the sake of argument that there may be such requirements). Often enough, an apparent requirement to cooccur with an agent is expressed without interruption. So there can be no operation of ‘agent deletion’ in CCs which applies freely to M, whether this is implemented by existential binding or otherwise. For example, there can be no [±AG] feature associated

with the construction (meaning 'agent possible but not required'), that dominates a hypothetical feature [+AG] feature of the means verb (meaning 'agent required').

It is therefore impossible to say, as the alternative to the NAT proposes, that the verb kụ 'strike' actually does require an agent argument lexically, but expression of such features happens to be blocked in CCs. We can only say what the NAT says. The need for kụ 'strike' to cooccur with an agent NP in simple clauses does not diagnose a *lexical* requirement of the verb at all. If it had such a requirement, it should be expressed in the CC context as well.

Given this, we need some way to ensure that a predicate occurs in relation to an agent, even when no verb in that predicate has a lexical requirement for one. The ungrammaticality of (412), for instance, must be explained by some constraint that is not tied lexically to the verb.

(412) * Ọba ahụ kụ -rụ (akụ).
gourd that strike -FACT (BVC)
Intended: 'There was an event of striking, with that gourd the patient.'

I will suggest in the next section what this constraint might be. In the course of that discussion, I will also hazard some remarks on what properties distinguish Igbo verbs like zọ 'tread on,' which occur only in relation to an agent, from verbs like kụ 'strike,' which do not.

3.3.4 On the distribution of agents

An Igbo VP meaning 'that gourd got struck' (kụ ọba 'strike gourd') must have an agent subject, but one meaning 'the gourd got split from striking' (kụ wa ọba 'strike split gourd') need not. Thus what decides the distribution of agents is not the meanings of individual verbs, but the meaning of the VP predicate. This repeats a point made in

section 2.7 of chapter 2. In English the domain for principles relating the distribution of a thematic relation to predicate meaning is individual verb roots; but in Igbo and Mandarin their domain is maximal VP predicates (i.e. daughters of VP). This is as we expect, if thematic relations are introduced with the verb in English, but with VP and vP in Igbo and Mandarin.

It now remains to ask what these principles are. What aspects of predicate meaning decide whether or not an agent argument will occur? I will discuss Igbo first, and most extensively. I then compare English, and finally turn briefly to Mandarin. We will see that the principles relating the distribution of agents to the event type of the predicate are different in each case.

The distribution of agents in Igbo

In Igbo a verb may be required to occur with an agent in simple clauses, (413), but free to occur without one in CCs, (414). The reason that (413) is ungrammatical, therefore, is not that a *lexical* requirement for an agent is left unsatisfied.

(413) * Ọba ahụ kụ -rụ akụ.
gourd that strike -FACT BVC
Intended: 'There was an event of striking, with that gourd the patient.'

(414) Ọba ahụ kụ wa -ra akụwa.
gourd that strike split -FACT BVC
'That gourd got split from striking.'

But neither is the failure of (413) due to a broader requirement, not linked to the verb, that any verb whose event involves an agent must occur in a context that identifies an agent. Kụ 'strike' occurs without specification of its agent both in (413) and in (414), but only the former is ungrammatical.

[16] My discussion here derives many important insights from Nwachukwu 1987, Ụwalaka 1988, and especially Hale, Ihiọnụ and Manfredi 1995.

So then what does explain (413)? I suggest it is bad because of a condition on what sort of VP makes a good unaccusative, i.e. what sort of VP can occur without a subject identifying the agent of its event.[17]

The condition has to do with the particular involvement of the *patient* in the VP event. At least in Igbo, the unaccusative is possible only if the event of the VP involves a definite change or activity in its patient. See Fillmore 1970, Smith 1978 and Dowty 1991 for sources of this generalization.[18]

(415) Condition on patiency (Igbo)

The unaccusative is possible only if the event of the VP predicate involves a definite change or activity in its patient.

Events of change of course include *CAUSE* events, among others that involve a change of state. The vague notion of 'activity' is meant to include at least movement, (416), and emission of sound or light, (417); see Levin and Rappaport Hovav 1995 on such "verbs of emission."

(416) My phone vibrated.

(417) a. My phone beeped.

b. My phone glowed.

Thus an Igbo VP kụ ọba 'strike gourd' must occur in a clause with an argument that identifies the agent of its event, the event of striking, not because any event

[17]My discussion of unaccusatives excludes consideration of so-called "middles," such as: Russet potatoes mash nicely. It is plausible to regard middles as a kind of unaccusative, one which expresses a modal generalization over events (see Keyser and Roeper 1984, for example). Yet many predicates that are natural in the middle are not possible in (non-middle) unaccusatives; pound flat is an example. Middles are thus enough of a special case that they can fairly be put aside in the present context.

[18]This condition seems not to hold in the Salish languages, where even a verb meaning 'hit', for example, can occur in a nonagentive intransitive (Davis and Demirdache 2000). See also Bhatt and Embick 2004, who imply that it does not hold in Hindi either.

of striking a gourd in fact involves an agent, but because such an event involves no necessary activity or change in its patient, the gourd. This, I claim, is the lesson of (413), repeated here.

(413) * Ọba ahụ kụ -rụ akụ.
gourd that strike -FACT BVC
Intended: 'There was an event of striking, with that gourd the patient.'

The VP kụ wa ọba 'strike split gourd,' on the other hand, does impute a definite change to the patient: it splits. And so this VP is fine without an agent subject, hence as an unaccusative, (414).

(414) Ọba ahụ kụ wa -ra akụwa.
gourd that strike split -FACT BVC
'That gourd got split from striking.'

The idea is summarized in (418).

(418)

VP predicate		Change/activity in patient	Unaccusative
kụ	'strike'	No	*
kụ wa	'strike split'	Yes	

This constraint regulates the distribution of agents with respect to VP predicates generally, not verb roots individually. And for this reason, saying that a verb lexically lacks the 'change/activity' property is not the same thing as saying, in different words, that it lexically requires an agent. A verb whose meaning lacks the 'change/activity' property may nonetheless occur in a sentence where it does not enter an agent relation with any noun phrase. It may do so because it may occur within a complex VP predicate that *does* have the 'change/activity' property, and is therefore acceptable in the unaccusative context.

We can implement this idea syntactically as in (419), through selection of VP by $v_{\emptyset}$. Unlike v_{AG}, $v_{\emptyset}$ does not introduce an agent argument. So a VP selected by $v_{\emptyset}$ will be unaccusative. If $v_{\emptyset}$ selects only VPs with the [change] feature, therefore, only VPs with this property will make good unaccusatives. The facts then follow, if we presume that kụ 'strike' itself does not have this feature, but CAUSE, and consequently any VP predicate containing CAUSE, does.[19]

(419) Condition on patiency, implemented by selection

$$v_{\emptyset}$$
$$[\ \_\_\text{VP}_{\text{[change]}}\ ]$$

Further conditions on the unaccusative may then exclude certain predicates which pass the patiency test.

As we know, Igbo does allow some predicates whose event involves an agent to occur as unaccusatives. Kụ wa 'strike split' occurs without an agent in (411), even though any event of splitting from striking necessarily involves a striker, the agent of its means subevent. But other predicates which imply an agent, such as zọ 'tread' or zọ wa 'tread split,' cannot occur as unaccusatives. What makes the difference?

My research suggests a provisional hypothesis. The VPs which cannot be unaccusative are those whose event is defined relative to traits or behaviors of a specifically *animate* agent. Inversely, the VPs which can be unaccusative do not describe such events. Simplifying this condition for expository purposes, let's say (420).

[19] A CC will describe a change in its patient even when the means verb on its own does not. So if (415) is implemented syntactically, it must be that the [change] feature of CAUSE dominates any incompatible feature of the means verb. By treating [change] as a privative feature, without +/− values, I avoid the possibility of a direct conflict. But if should prove necessary to recognize two opposing values for [change], it would be necessary to treat CAUSE as the head of the construction, such that its feature dominates that of the means verb.

(420) Condition on agency (Igbo)

If the event of the VP involves an *animate* agent intrinsically, then the unaccusative is impossible.[20]

I discuss the factual background for this generalization below. First let us work through its effects and its implementation.

Treading requires mobile feet, a trait of animate creatures. Thus (420) keeps any VP whose event involves treading from occurring as an unaccusative, correctly forbidding both (421) and (422), which repeats (410).

(421) * Ọba a zọ -rọ azọ.
gourd this tread on -FACT BVC
Intended: 'There was an event of treading, with this gourd the patient.'

(422) * Ọba a zọ wa -ra azọwa.
gourd this tread on split -FACT BVC
Intended: 'This gourd got split from treading.'
(Hale et al. 1995:85, tr. AW)

But VPs meaning 'to strike that gourd' or 'to make that gourd split by striking' remain fine as unaccusatives, since anything can strike something. You can get struck by a person, a thrown rock, or a surface that breaks your fall. The striker needn't be animate.[21] (423) summarizes the scheme.

[20]Roughly, the category of animate things comprises those things that we consider capable of 'action.' Certainly, action needn't be volitional, rational, or intentional. And, as is usual in cases where animacy is grammatically relevant, artificial simulations of animate creatures may count as animate for linguistic purposes. Thus it is possible to describe a legged robot as *treading* on a gourd, for example. But I cannot say whether all self-generated movement counts as action, such that (e.g.) the motion of amoebas makes them animate for the purposes of Igbo.

[21]Compare the following comment of Nwachukwu's (1987: 111). Context makes clear that, by "agent," he means something more like 'animate agent.'

> [T]he means through which change [described by an unaccusative CC] is brought about is not always an agent. [...] For example, a piece of metal or wood can fall off a moving vehicle and break kụ ji ['strike snap'].

The collision that snaps the metal or wood has two participants, but neither one is an animate agent.

(423)

VP predicate		VP event involves animate agent	Unaccusative
zọ	'tread on'	Yes	*
zọ wa	'tread-on split'	Yes	*
kụ	'strike'	No	
kụ wa	'strike split'	No	

I see two ways of implementing this principle formally, with an interesting difference between them. The first assigns all verbs like zọ, whose event is defined relative to an animate agent, a feature [A]. We can then ensure that any VP with this feature—hence, given the criterion of its assignment, any VP whose event has some part which refers intrinsically to an animate agent—cannot occur as an unaccusative. This might be done by refining the selectional features of $v_{\emptyset}$, as in (424). This says the VP sister to $v_{\emptyset}$, which must have the feature [change], cannot have the feature [A].

(424) Condition on agency, implemented by selection

$$v_{\emptyset}\left[\ \_\_\text{VP}\left[\begin{array}{c}\text{change}\\ *\text{A}\end{array}\right]\ \right]$$

Thus any VP including zọ 'tread on' cannot be unaccusative, and will need a subject identifying the agent of its event. (421) and (422) are ruled out accordingly.

Now notice, assigning a verb [A] is not the same thing as assigning it an agent as a lexical argument, since a verb with [A] has no requirement to coocur with a phrase naming the agent of *its own* event. The grammar only ensures that VPs including an

[A] verb have *their* agent identified. When the VP predicate is a complex causative, the required agent will identify the agent of causation, and not the agent of the means event individually. It is true that Igbo speakers construe the subject of (425) as the agent of treading. But this not something forced by the feature [A] itself.

(425) Ọ zọ wa -ra ọba a.
3sS tread on split -FACT gourd this
'S/he made the gourd split by treading.'

So the grammar embodies this claim: if an event of causation has a subevent that is defined relative to an animate agent, then the agent of causation must identified.

The second possibility is to actually assign zọ 'tread on,' and all similar verbs, an agent as a lexical argument. This can be done as in (426)—so long as we can distinguish the agent as an external argument, one to be instantiated by the subject. The superscripted asterisk stands for whatever formal mechanism accomplishes this (cp. Rothstein 2001).

(426) $[\![$ zọ 'tread on' $]\!] = \ldots \lambda x^* \lambda e.[\ \mathit{tread}(e) \wedge \mathrm{AG}(e) = x^*\ \ldots\ ]$

Again (421) and (422) are ruled out, but now because they don't satisfy a lexical requirment of zọ 'tread on.' Correspondingly there is an important difference in the semantics. Given (426), we represent the interpretation of the subject in (425) in the semantics proper; the subject is grammatically constrained to identify the agent of treading. (For the mechanics by which an external argument of a verb in M can be inherited by the complex predicate, see section 1.5.1 of chapter 1, and section 2.9.1 of chapter 2.)

I will not choose between these two implementations, as I see some attractions in each. It must be pointed out, though, that the second possibility is not directly incompatible with the NAT. Fundamentally, the NAT says this. Verbs in Igbo and

Mandarin that occur with an agent (or patient) in simple clauses do not therefore have an agent (or patient) as a lexical argument. If the agent (or patient) is not required in CCs, it is not a lexical argument. Typically, Igbo and Mandarin verbs do not project uniformly, and so typically, they are without arguments. But this does not rule out the possibility that, in some cases, there is evidence showing the opposite, namely that a certain verb *does* have a particular lexical argument. And facts like (421) and (422) could be taken as such. Remember, I am arguing that the choice between projectionist and nonprojectionist models is empirical; each model is right for some cases and wrong for others.

Having seen how they can be modeled within the general framework of the NAT, let me return to the facts themselves. I suggested that the semantic feature unifying the class of verbs that fail to occur in the M slot of an intransitive CC is that their event is defined—differentiated from other event-types—relative to traits of an animate agent. I emphasize that this is only a first hypothesis, one that I think is a bit better than others.

The main work on this topic is Hale, Ihiọnụ, and Manfredi 1995. Their discussion creates the impression that verbs barred from the intransitive CC are those that attribute intention or volition to their agents, or specify a manner or instrument of action. But neither suggestion is quite right.

(427) can describe a situation where Eze stepped on the gourd quite accidentally, and still (428) is impossible. This would be surprising, if intention or volition is what mattered, rather than just the animacy of the agent.

(427) Eze zọ wa -ra ọba.
E. tread on split -FACT gourd
'Eze made the gourd split by treading.' (Hale et al. 1995: 84, tr. AW)

(428) * Ọba a zọ wa -ra azọwa.
gourd this tread on split -FACT BVC
Intended: 'This gourd got split from treading.'
(Hale et al. 1995: 85, tr. AW)

Just so, the reason that (428) contrasts with (429) is not that treading must be intentional, but rubbing need not be. Both can be entirely unintentional. But treading intrinsically involves traits of an animate creature (mobile feet) while rubbing does not. Speakers judge (429) true when the mosquito has been squeezed between two moving surfaces; neither surface need belong to an animate creature.

(429) Anwuta ahụ hịọ pịa -ra ahịọpịa.
mosquito that rub crushed -FACT BVC
'That mosquito got crushed from rubbing.'

It seems to me that manner and instrument are not critical features either. I have found many intransitives whose means verb describes a particular manner of motion, or a particular sort of instrument. The verbs include hyi 'sweep' (430), kpọ 'chop' (431), sọ 'prick' (432), and kpa 'clip,' besides hịọ 'rub' (429) and of course bi 'cut (with a knife).'

(430) Tebul h̃yi ch'a -ra eh̃yicha.
table sweep clean -FACT BVC
'The table got clean from sweeping.'

(431) Nkụ kpọ wa -ra akpọwa.
firewood chop split -FACT BVC
'The firewood got split from chopping.' (Nwachukwu 1987: 102, tr. AW)

(432) Osisi m sọ ji -ri asọji.
wood 1sPOSS poke snap -FACT BVC
'My stick got snapped from poking [it/something with it].'

(433) Waya kpa ji -ri akpaji.
wire clip snap -FACT BVC
'The wire got snapped from clipping.'

It is true that sweeping, chopping, poking and clipping are actions typically performed by animate agents. But they are not actions, it seems to me, that are defined by this. They are differentiated from other actions by their instrument, by the manner of its motion, or by the characteristic result of the action, but not by any trait of their agent that is particular to its being an animate creature. Moreover, these verbs are sometimes fine with a subject referring to an inanimate thing. You can say that a needle poked you, for instance (sọ 'poke'). And in warning a Muslim friend not to touch a contaminated broom, you can tell him that it just swept the butcher's floor (hyi 'sweep'). Typically my Igbo consultants accepted statements like these, when the verb was one that could occur in an intransitive CC.

In contrast, instrumental or manner verbs whose event clearly is defined by features or behaviors of an animate agent always resist the intransitive, it seems to me. I offer the (b) cases below as examples.

(434) a. Egbe b'e ji -ri osisi ahụ.
kite (bird) perch on snap -FACT branch that
'The kite made that branch snap by perching on [it].'

b. * Osisi ahụ b'e ji -ri eb'eji.
wood that perch on snap -FACT BVC
Intended: 'That branch got snapped from perching [i.e. from being perched on].'

(435) a. Obi wụ ji -ri tebul ahụ.
O. jump snap -FACT table that
'Obi made the table split by jumping [on it].'

[21] The Igbo speakers who judged this sentence all said that wụ 'jump' can only describe the jumping of an animate creature, and cannot describe (e.g.) the bouncing of a ball or pebble.

b. * Tebul ahụ wụ wa -ra awụwa.
table that jump split -FACT BVC
Intended: 'That table got split from jumping.'[22]

(436) a. Ọkụkọ kpu wa -ra akw'a.
fowl brood split -BVC egg
'The chicken made the eggs split by brooding [them].'

b. * Akw'a kpu wa -ra ekpuwa.
egg brood split -FACT BVC
'The eggs got split by brooding.'[23]

(437) a. Chidi be de -re akịsị n' akwa
C. cry wet -FACT hanky P cry_N
'Chidi made the hanky wet by crying.'

b. * Akịsị be de -re (n' akwa) ebede
hanky cry wet -FACT PREP cry_N BVC
'The hanky got wet from crying.'

(438) a. E- de ji -ri -m pensul.
DSP write snap -FACT -1s pencil
'I made the pencil (nib) snap by writing.'

b. * Pensul m de ji -ri edeji.
pencil 1sPOSS write snap -FACT pencil
Intended: 'My pencil got snapped from writing.'[24]

Data like these suggest that what rules out the unaccusative is not the involvement of an instrument or a particular manner of motion, but again, the more general notion of an action that intrinsically involves an animate agent.

[23]Igbo kpu is a transitive verb meaning 'brood' in the archaic sense of the English verb: "The mother hen brooded her eggs." Only animals can be the agent of kpu 'brood.' The collocation kpu wa is given in Igwe 1999: 332, where it is translated as 'to break by brooding.' Sometimes kpu an mean 'crouch over' more generally; but even then, crouching is something done by legged animals.

[24]I suppose it is possible for machines to write things. But writing is intrinsically a human behavior, in at least this sense: what the writing machine does counts as writing only relative to behavioral conventions of human beings. Without these, the machine would just leaving marks on things, no different than a machine that puts designs on linoleum, or perforates sheet metal.

Finally, there is oblique support for (420) in the intuitions speakers voice about those intransitive CCs that are grammatical. When asked for scenarios that verify an intransitive (unaccusative) CC, one where the means verb does entail the involvement of an agent, speakers typically produce one in which that agent is inanimate. For example, the scenario first imagined for (439) was one where the breadfruit had fallen; in this case the strike is administered by the ground. The pricker in (440) was imagined to be a protruding nail. And in response to (429), repeated here as (441), speakers described a situation where the bug was squashed by being on a person's leg when he moved in his seat. In this situation it is just as reasonable to consider the seat the rubber as the person moving.

(439) Ụkwa sụ bịa -ra asụbịa
breadfruit pound depress -FACT BVC
'The breadfruit got smashed from pounding.'

(440) Ọba m sõ fu -ru esõfu.
gourd 1s prick have hole -FACT BVC
'My gourd got a hole pricked into it.'

(441) Anwuta ahụ hịọ pịa -ra ahịọpịa.
mosquito that rub crushed -FACT BVC
'That mosquito got crushed from rubbing.'

None of these intransitives *entail* that the agent of the means event was inanimate. They would not be proven false, if it turned out that a person had pounded the breadfruit, poked the gourd, or smacked the mosquito. My consultants agreed on this, without hesitation. But what they all said was, had the speaker known that the agent was a person, he would have used the transitive, perhaps with an impersonal subject: '*Someone* pricked a hole into my gourd,' etc. So speakers feel compelled to refer to an agent, if they know it is animate, but not otherwise. By implication,

therefore, if the event of the verb is defined relative to a specifically animate agent—like zọ 'tread on, b'e 'perch on,' or de 'write'—speakers will feel compelled to use these verbs only in the transitive frame. The grammar I propose can be seen as a formalization of this impression.

I hope that further research will refine the hypothesis in (420), the agency condition. Regardless of what condition is correct, what matters here is to see how the condition can be implemented within the outlines of our nonprojectionist grammar.

The distribution of agents in English

Now let us turn to English. We are free to suppose that the patiency condition in (415), repeated as (442), applies here as well.

(442) Condition on patiency (English, Igbo)
The unaccusative is possible only if the event of the predicate involves a definite change or activity in its patient.

It does seem to be true that all good unaccusatives in English describe a definite change or activity in their patients, (443) (Fillmore 1970).

(443)

Predicate	Change/activity in patient	Unaccusative
pound	No	*
shout	No	*
freeze	Yes	✓
freeze solid	Yes	✓
vibrate, beep, glow, ...	Yes	✓

But the effect of (415)/(442) is eclipsed for all English predicates whose meaning implies an agent, since English imposes a condition stronger than Igbo (420). The

unaccusative is excluded to all predicates whose event has an agent, animate or not. If the event cannot transpire spontaneously, that is, then an agent argument is required (Smith 1978, Haspelmath 1993, Levin and Rappaport Hovav 1995).

(444) Condition on agency (English)

The unaccusative is impossible if the event of the predicate necessarily involves an agent.

Consequently, even predicates which imply a definite change or activity in their patients, like pound flat and shout hoarse, cannot occur as unaccusatives, (445).

(445)

Predicate	Agent	Unaccusative
pound	Yes	*
pound flat	Yes	*
shout	Yes	*
shout hoarse	Yes	*
freeze	No	
freeze solid	No	

For familiar reasons, the pattern in English can be modeled by assigning verbs an agent as a lexical argument, whenever their event is one that necessarily has an agent. That is, we could assign denotations like the following:

(446) a. $[\![\text{ pound }]\!] = \lambda y \lambda x \lambda e.[\ \textit{pound}(e) \wedge \text{PAT}(e) = y \wedge \text{AG}(e) = x\ ]$

b. $[\![\text{ shout }]\!] = \lambda x^* \lambda e.[\ \textit{shout}(e) \wedge \text{AG}(e) = x^*\ ]$

By doing this, we would also account for the fact that, in transitive CCs with these verbs in M, like those in (447), the subject is necessarily understood as the agent of the means event.

(447) a. Al pounded the cutlet flat.

b. Al shouted his throat hoarse.

Alternatively, we could assign these verbs the feature [A], the feature which in Igbo is assigned only to verbs whose event intrinsically has an animate agent. Given that $v_{\emptyset}$ is again specified as in (448), this would prevent verbs like pound and shout from occurring in any unaccusative VP, ruling out the both the simple clauses in (449) and the CCs in (450).

(448) Condition on agency, implemented by selection (English)

$$v_{\emptyset}\left[\ \_\_\mathrm{VP}\left[\ \begin{matrix}\text{change}\\ *\mathrm{A}\end{matrix}\ \right]\ \right]$$

(449) a. * The cutlet pounded.

b. * There/it_{expl} shouted.

(450) a. * The cutlet pounded flat.

b. * My throat shouted hoarse.

Having captured these facts, one might allow that the verbs do not have an agent argument, and instead denote as in as in (451).

(451) a. $[\![\ \textsf{pound}\ ]\!] = \lambda y \lambda e.[\ \mathit{pound}(e) \wedge \mathrm{PAT}(e) = y\ ]$

b. $[\![\ \textsf{shout}\ ]\!] = \lambda e.\mathit{shout}(e)$

But this means accepting that the interpretation of the subjects in (447) is not fixed in the semantic derivation. The fact that Al identifies the pounder in (a) and the shouter in (b) must result from an inference, one following the scheme in (452).

(452) Agent of causation inference (English)

If x is the patient of e_c, and e_c is an event of e_m causing e_r, then x is the agent of e_m.

This is somewhat unattractive, however, since (452) is not universally true. In Mandarin, and perhaps sometimes in Igbo, the agent of causation is not the agent of the means event (see section 2.9.1 of chapter 2). So to the extent that a language-particular semantic postulate is considered unacceptable, the projectionist model of the agent is to be preferred.

In sum, the crucial difference between English and Igbo is between the two conditions on agency, Igbo (420) and English (444). If we implement these conditions syntactically, the languages differ in what semantic properties motivate the distribution of various features in the lexical representations of verbs: either an agent argument or the feature [A]. When a verb has an agent argument, it needs to cooccur with a phrase identifiying the agent of its event. When a verb has [A], it needs to occupy a VP that cooccurs with a phrase identifying the agent of *its* event. In Igbo one or the other feature is assigned when the verb's event is defined relative to a properties of an animate agent. In English one or the other feature is assigned when the verb's event has an agent, animate or not.

The distribution of agents in Mandarin

Again in Mandarin, it seems correct to assume the condition on patiency, (453).

(453) Condition on patiency (Mandarin, English, Igbo)

The unaccusative is possible only if the event of the predicate involves a definite change or activity in its patient.

This would explain why simple VPs with dǎ 'hit' or cā 'wipe' are unacceptable as unaccusatives (Tan 1991), (454,456), but intransitive CCs with the same verbs in M are fine, (455,457). (So as to force the intransitive/nonagentive parse, and exclude the transitive/agentive parse under which the patient is a fronted object, the subject noun phrases here are interrogative; see section 3.1.2 of this chapter.)

(454) * nǎge huāpíng dǎ -le?
which vase strike -PFV
Intended: 'Which vase underwent striking?'

(455) nǎge diàn-nǎo dǎ huài -le?
which computer strike bad -LE
'Which computer is broken from striking?'

(456) ?* nǎjiān fángjiān -de hēibǎn cā -le?
which room -NMOD blackboard wipe -LE
Intended: 'Which rooms' blackboards underwent wiping?'

(457) nǎjiān fángjiān -de hēibǎn cā gānjīng -le?
which room -NMOD blackboard wipe clean -LE
'Which room's blackboards are clean from wiping?'

Or perhaps a slightly broader condition holds. Tan (1991) suggests that every VP which can be unaccusative is "telic"; that is, the VP describes an event with an intrinsic endpoint or culmination. I will leave it open whether this, or the narrower condition in (453), is correct; consult Tan 1991.

More interesting here is that Mandarin obeys neither the English nor the Igbo conditions on agency. (455) and (457) already show that verbs whose event necessarily has an agent, like dǎ 'strike' and cā 'wipe,' can nevertheless occur in an unaccusative VP, and without any phrase referring to their agent. (459) shows that this is true even when the agent implied by the verb is necessarily animate, like cǎi 'tread on.'

The example evokes a scenario following an attack by angry dragons, with insurance agents wondering who will need to be compensated.[25] Contrast Igbo (460).

(459) shéi -de fángzi cǎi tā -le?
who -NMOD house tread on collapse -PFV
'Whose houses got smashed from trampling?'

(460) * Ọba ahụ zọ wa -ra azọwa.
gourd that tread on split -FACT BVC
Intended: 'That gourd got split from treading.'

Still, as we expect given the condition on patiency, (453), cǎi 'tread on' cannot occur without an agent in a simple clause, (461).

(461) * shèi -de fángzi cǎi -le?
who -NMOD house tread on -PFV
Intended: 'Whose houses underwent trampling?'

According to Tan (1991), telicity—or, for the sake of argument, my (453)—is not only a necessary but a sufficient condition: *any* VP whose event is telic, or involves a definite change in its patient, can be unaccusative. This implies that unaccusatives are subject to no condition on agency whatsoever. Any CC should be acceptable as an unaccusative in Mandarin, regardless of any semantic properties of the verb in M, since all CCs describe a definite change in their patients.

Whether Tan's data justify her conclusion is not clear, since she often fails to control for the possible transitive, *pro*-drop analysis of her crucial examples. And I will not undertake to settle the question. What matters here is that Mandarin

[25] To describe the attack itself, one might have said (458).

(458) dà kǒnglóng cǎi tā -le fángzi.
big dinosaur tread on collapse -PFV house
'Big dinosaurs made the houses collapse by trampling.'

obeys neither the Igbo nor the English condition on agency. So each language differs from the others in the principles govern the distribution of agents. A predicate is matched with an agent in English if its event has an agent, and in Igbo, if its agent is necessarily animate. But in Mandarin, neither condition on agency is in force, leaving the patiency condition alone salient.

3.3.5 Subject-control CCs with a postverbal NP

In Mandarin there are subject-control CCs with a second noun phrase following the predicate, like in (462) and (463). As a rule the second NP can be dropped, (464) and (465). And it is widely agreed (see e.g. Chang 1998, but cf. Y. Li 1995) that the second noun phrase must refer to a type of thing, or to an indefinite set, but not to any particular individual(s), (466) and (467).

(462) Lǎo Wèi hē zuì -le jiǔ.
L.W. drink drunk -PFV wine
Intended: 'Lao Wei got drunk from drinking wine.'

(463) húli zhuī lèi -le tùzi.
fox chase tired -LE rabbit
Intended: 'The fox got tired from chasing rabbits.'

(464) Lǎo Wèi hē zuì -le.
L.W. drink drunk -PFV
'Lao Wei got drunk from drinking.'

(465) húli zhuī lèi -le.
fox chase tired -LE rabbit
'The fox got tired from chasing.'

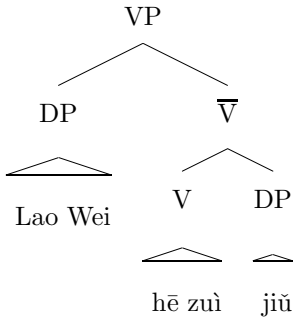
(466) * Lǎo Wèi hē zuì -le nà píng Máo Tái.
L.W. drink drunk -PFV that bottle Mao Tai
Intended: 'Lao Wei got drunk from drinking that bottle of Mao Tai.'

(467) * húli zhuī lèi -le nàzhī tùzi.
fox chase tired -LE that rabbit
Intended: 'The fox got tired from chasing that rabbit.'

Like all subject-control CCs, those with a second NP postverbally do not refer to an agent of causation (Y. Li 1990, 1995). (462), for example, is diagnosed as nonagentive by the same tests that showed (464) to be nonagentive in section 3.2.3. So in the two-NP cases as well, we ought to assume that the surface subject is the direct object underlyingly: Lǎo Wèi is the direct object of (462) and húli 'fox' is the direct object in (463).

Correlatively I deduce that CCs like (462) and (463) are double unaccusatives, with two underlying objects. I will continue to refer to the surface subject as the underlying *direct* object, and call the NP that remains postverbal the *secondary* object. For the sake of concreteness, I will assume that the direct object is generated in the specifier of VP, and the secondary object in the complement.

(468)



The idea that Mandarin has double unaccusatives is not unique to this discussion. Chappell 1999 analyzes sentences like (469) in this way; (470) is a sentence of the same type, where the predicate is a CC.[26]

(469) tā sǐ -le mǔqīn.
3s die -PFV mother
'He had his mother die.'

[26]The double unaccusatives never have both objects surface postverbally. This is perhaps an effect of Case.

(470) shēngchǎn duì bìng sǐ -le yitóu niú.
production team be ill die -PFV one cow
'The production team had a cow die from illness.'
(L. Li 1980: 98, tr. AW)

Similarly, Huang 1992 proposes an analysis like (468) for the VP in transitive constructions like (471), known as *ba*-constructions with a retained object. For Huang, both jùzi 'orange' and pí 'skin' are generated within the VP, the former in the specifier and the latter in the complement. Only the complement surfaces postverbally.

(471) Lǎo Wèi bǎ jùzi bō -le pí.
L.W. BA orange peel -LE skin
'Lao Wei peeled the orange of its skin.'

Given (468), our semantic rules ensure that the direct object, in the specifier of VP, is interpreted as the patient of the $\overline{\text{V}}$ event, as always. How the semantics incorporates the secondary object formally is a question I will come to below. First I want to discuss how double unaccusative CCs are in fact understood, and how the data relate to the NAT.

If the NAT is correct, the grammar places no absolute restrictions on the interpretation of any argument NP with respect to the means verb. We have seen that this expectation is satisfied in subject-control CCs with a single object. (472–474) repeat (387–389), which provided some of the evidence for this.

(472) yīfu xǐ gānjing -le.
clothes wash clean -LE
'The clothes got clean from washing [i.e. from being washed].'

(473) Xiao Wang xǐ leì -le.
X.W. wash tired -LE
'Young Wang got tired from [him] washing [stuff].' (Ma 1987: 424; tr. AW)

(474) xíe xǐ shī -le.
shoe wash wet -LE
Can mean: '[My] shoes got wet from [my] washing [stuff].'
(Ma 1987: 424, tr. AW)

But according to judgments discussed in Y. Li 1990, the predictions of the NAT are not satisfied in subject-control CCs with two NPs, the double unaccusatives. In these cases, understood relations to the means event are fixed. The preverbal NP is understood as the agent of the means event, and the postverbal as its patient. Thus the intended interpretation in (463) is possible, but the intended interpretation of the same string in (475) is not.

(475) * húli zhuī lèi -le tùzi.
fox chase tired -LE rabbit
Intended: 'The fox got tired from rabbits chasing it.'

I am sure that Li's judgments are correct. But I do not believe that their explanation is purely grammatical. For it is hard to see how a grammar which imposes a fixed interpretation on subject-control CCs with two NPs would not do the same for subject-control CC with only one. The grammar Li proposes says that subject-control entails a fixed interpretation of the arguments with respect to M; and this leaves facts like those in (472–474) unexplained.

Limitations on the natural interpretation of subject-control CCs with two NPs, I believe, have their source in semantics, in a broad sense. They derive from how we think of events of causation, and the fact that subject-control CCs are nonagentive.

As I analyze it, (463) describes an event of causation: chasing causes exhaustion. It refers to the patient of this event, the fox, and thus it entails that the fox gets exhausted. But it does not refer to an agent of causation. (463) just talks about what happens to the fox, not who made it happen. This fact strongly favors the inference that the fox is the chaser, I suggest, and not the rabbit.

The secondary object in (463), tùzi 'rabbit,' needs some interpretation with respect to some part of the complex event of the CC predicate. Suppose we try to interpret it as the agent of its means event, the chaser; then the chasing by the rabbit causes the exhaustion of the fox. In that case it would seem natural, maybe inevitable, to regard the rabbit as instigating the inception of the fox's exhaustion, i.e. as being the agent of causation. But then we are referring explicitly to the agent of causation—and this is contrary to the fact that (463), a subject-control CC, does not refer to any agent of causation. As a result, the interpretation of the rabbit as the chaser is unavailable, as Li observes.

Let me put it differently. If chasing by the rabbit causes exhaustion in the fox, then the rabbit is the causer. To refer to the rabbit, under the assumption that he is the agent of chasing, is therefore to refer to the causer. But intransitive CCs contrast with transitive CCs exactly in *not* referring to a causer. If one had meant to refer to the agent of causation, one would have said (476), an object-control CC which asserts explicitly that the subject is the agent of causation.

(476) tùzi zhuī lèi -le húli.
rabbit chase tired -PFV fox
Intended: 'The rabbit made the fox tired by chasing it.'

And therefore it makes no sense to assume that the postverbal noun phrase in (463) identifies the agent of M, the chaser.

To regard the fox as the chaser in (463), on the other hand, does not clash with the lack of reference to a causer. It is easy to think of someone's *own* actions as causing effects in him, without also regarding him as the instigator of these consequences, the agent of causation. Sentences like (464) make this clear. The sentence says that Lao Wei got drunk from drinking. Lao Wei is taken to be the agent of drinking, but he is not therefore the agent of causation, as was demonstrated in section 3.2.3. That he

got drunk from drinking is something that just happened to him, according to this nonagentive CC. Thus it is natural to understand (463) with the fox as the chaser, and the rabbit as the chasee.

Unlike Li's, this account of (463) does not make the wrong prediction that all subject-control CCs should have a fixed interpretation. In particular it does not even predict that the interpretation of (465), repeated here as (477), should be fixed. This is good, since the sentence can in fact describe two distinct situations: the fox can be the chaser or the chased. This is what I expect on general grounds.

(477) húli zhuī lèi -le.
fox chase tired -LE
'The fox got tired from chasing.'

More importantly here, such ambiguity (or vagueness, rather) does not conflict with my account of (463). What I said is that the secondary object in (463), tùzi 'rabbit,' cannot be interpreted as the chaser, given the lack of reference to a causer. It is for this reason that (463) cannot describe an event where the rabbit chases the fox, and not because of any difficulty in interpreting the fox as the chasee. On its own, this interpretation makes perfect sense: the fox gets tired from a chasing of which it is the patient; this is not incompatible with the fact that the CC does not refer to an agent of causation. In the absence of a secondary object, therefore, the subject's interpretation with respect to M is unconstrained.

Now let us get to the question of how the secondary object is incorporated into the semantic derivation of a double unaccusative CC. Under a projectionist theory of Mandarin, there would be no difficulty assigning some interpretation to both the direct and the secondary objects in (462) and (463). They would receive the agent and patient relations associated lexically with the means verb. Under my nonprojectionist theory, there is no problem interpreting the direct object, in the specifier of VP, since

that position is associated with a patient relation. But what about the secondary object? By hypothesis its interpretation is not assigned by the verbs in M or R, which have no lexical arguments. So it must derive from the object's syntactic position. But what thematic relation is left for this position, with *patient* already taken?

I see no alternative but to propose that the position receives an unspecified relation θ, whose content is determined by context. Thus the VP of (462) denotes as in (478).

(478) $[\![\ [_{\mathrm{VP}}$ Lao Wei $[_{\overline{\mathrm{V}}}$ hē zuì jiǔ $]\ ]\!] = \lambda e \exists e_1 \exists e_2 .[\mathrm{CAUSE}(e, e_1, e_2) \wedge \mathit{drink}(e_1) \wedge \mathit{drunk}(e_2) \wedge \mathrm{PAT}(e) = \mathit{laowei} \wedge \theta(e) = \mathit{wine}\ ]$

Lao Wei gets drunk from drinking, and this involves wine somehow. From this it is natural to infer, or to assume, that Lao Wei drinks the wine. Lao Wei is a possible drinker; wine, a possible drinkee; and taking the drinking to be by him and of the wine explains why it should result in his drunkenness. The relation θ between the wine and the event of causation is thus the relation of being the patient of its means event—not something for which we have a name.

Something like this is often proposed in the analysis of possessors, and perhaps other adjuncts, in deverbal nominalizations. The discussion in Marantz 1997 is apposite here. Marantz argues that the understood agent relation in (479), between John and the destruction, is not established explicitly in the grammar.

(479) John's destruction of the city

The grammar says only that there is some unspecified relation, θ, between the two. That θ is the agent relation is only an assumption made in light of the known facts, which include these: (i) events described as destructions have an agent and a patient, (ii) John is a possible agent of destruction, and (iii) the patient of this particular destruction is the city, something which Marantz believes the semantic representation of

(479) does express explicitly.[27] As Marantz observes, this analysis has the advantage of generalizing over both (479) and cases like (480).

(480) yesterday's destruction of the city

Mandarin is not the only language where subject-control CCs may have a secondary object. We already saw Lisu (481) and Yoruba (482) above. (483) and (484) add examples from Kayah Li, a VO language in the Karen branch of Tibeto-Burman, described in Solnit 1997.

(481) e^{55} ʤi^{33} phɯ^{31} do^{33} ʒi^{42} le^{33} ua^{44}.
3s wine drink drunk PFV PRT
'S/he got drunk from drinking wine.'
(Xu, Mu, and Gai 1986: 92; translated by sentence (462) in the source)

(482) Wón mu otí yó.
they drink wine drunk
'They are drunk.' (ex. & tr. Bamgboṣe 1974)

(483) ʔa ʔō mɯ thɅ̄ʔíphrè.
3 drink drunk whiskey
'S/he got drunk on whiskey.' (ex. & tr. Solnit 1997: 72)

(484) vɛ̄ ʔīchi síphrá khru.
1s split tired firewood
'I got tired splitting firewood.' (ex. & tr. Solnit 1997: 72)[28]

If these are indeed complex causatives, rather than instances of another construction, I assume they have the same sort of an analysis as what I have provided for Mandarin (462) and (463).

[27] Marantz puts it this way (1997: 218): "Essentially, 'posessors' of NPs may be interpreted in almost any kind of semantic relation with respect to the possessed NP that can eassily be reconstructed from the meaning of the possessor and the possessed themselves."

[28] Notice that Solnit's translations of (483) and (484) do not depict the subject-referents as agents of causation: 'S/he *got* drunk on whiskey,' 'I *got* tired splitting firewood.'

3.3.6 Summary

Like transitive CCs, intransitive CCs show that English has the UPP, but Mandarin and Igbo do not. So again, the distribution of agents and patients in the latter languages cannot be captured in a projectionist model. It is necessary to state conditions on their occurrence over structures larger than individual verb roots. In the case of agents we find a clear cross-linguistic contrast between what those conditions are. In English, a predicate whose event involves an agent must have its agent identified. In Igbo, identification of an agent is required only when the event is defined relative to an animate agent. And in Mandarin, neither condition holds.

3.4 Matching arguments and subevents

Section 3.3.1 reviewed the explanation of data like (485–488) offered in Levin and Rappaport Hovav 1995.

(485) * Al shouted hoarse.

(486) * His throat shouted hoarse.

(487) * Al pounded weary.

(488) * The cutlet pounded flat.

Under an unergative parse, the one naturally suggested by (485) and (487), the sentences violate the DOR, since the underlying subject controls R. Under an unaccusative parse, the one favored by (486) and (488), the sentences violate a proposed lexical requirement of the means verb. Shout and pound have a lexical requirement for an agent, and under the unaccusative parse, this goes unsatisifed, since (by hypothesis) the subject does not identify the agent of the means event.

For reasons discussed in section 3.2.8, the DOR is abandoned in Rappaport Hovav and Levin 2001, RHL for short. Correspondingly they explore a different account of data like (485–488), one that rules out all the ungrammatical intransitives in the same way. Whether a CC predicate can be intransitive, they say, is decided by the principle in (489) (cp. Grimshaw and Vikner 1993).

(489) Argument-per-Subevent Condition (A/E)
There must be at least one argument XP in the syntax per subevent in the event structure (Rappaport Hovav and Levin 2001: 779, 1998: 113)

The predicates pound flat and shout hoarse have *two* subevents in their event structures, according to RHL: pounding and getting flat, shouting and getting hoarse. But in examples (485–488), each finds only a single argument, the subject. So these sentences violate the A/E, and that's why they're ungrammatical.

Sometimes the event structure of a CC can be unitary, according to RHL, and then the CC can be intransitive. This happens, they argue, only if progress towards the result state described by R is an intrinsic consequence of undergoing the means event described by M. An intrinsic consequence of freezing is becoming more solid. So freeze solid has a unitary event structure, and is possible as an intransitive, (490).

(490) The lake froze solid.

(That the lake is construed as the patient of freezing, and not as its agent, reflects another principle. As discussed in section 3.2.8, RHL claim that control of R must be by the patient of the M event, unless the means verb is unergative.)

Yet one can shout without anything getting hoarse, or pound without anything getting flat. So the intransitive is still forbidden to shout hoarse and pound flat, since their event structure is not unitary; (485–488) remain in violation of A/E.

The Argument-per-Subevent Condition is an interesting idea, insofar as it promises reduction of argument structure to event structure (cp. McCawley 1971, Dowty 1972, Parsons 1990, among others). But it is contradicted plainly by the intransitive CCs of Igbo and Mandarin discussed in section 3.3.2. I'll just discuss Igbo here, which provides the clearer case.

Recall the sentences in (491) and (492).

(491) Eze kụ wa -ra ọba.
E. strike split -FACT gourd
'Eze made the gourd split by striking.' (Hale et al. 1995:84, tr. AW)

(492) Ọba a kụ wa -ra akụwa.
gourd this strike split -FACT BVC
'This gourd split from striking.' (Hale et al. 1995:84, tr. AW)

For this CC predicate, kụ wa 'strike split,' the event structure clearly cannot be unitary. What is struck might split as a result, but not of intrinsic necessity. So (404) describes two distinct subevents, striking and splitting. And nevertheless, (404) has only one argument in syntax, contra A/E.

Semantically as well, in its assertion, sentence (492) refers to only one event participant, the patient. It does not refer to the agent of striking or the agent of causation, contrasting in this way with the impersonal transitive in (493), which says '*Someone* made that gourd split by striking it'; see section 3.1.2 of this chapter.

(493) A- kụ wa -ra ọba ahụ.
DSP- strike split -FACT gourd that
'Someone made that gourd split by striking.'

One might think that this challenge to the A/E can be neutralized by comparing (492) to derived statives like English (494), i.e. resultative participles. These are fine, of course, even with verbs that otherwise need an agent, like pound.

(494) The cutlet is pounded flat (and ready to fry).

RHL don't say why resultative participles of English CCs do not themselves violate A/E, but I suppose they make two assumptions: (i) the A/E applies to the participle, and not the base predicate; (ii) a stative, as such, cannot describe distinct subevents, even when the state cannot be defined without mentioning two antecedent events. Something like this is necessary, if A/E is to be sustained in the face of (494).

But it is not enough to save A/E from the facts of Igbo. The Igbo intransitive is different from the English resultative participle in two ways. First, it is verbal and morphologically simple, lacking any sign of derivation. Second, and more importantly, the Igbo intransitive is open to eventive (nonstative) interpretation, as shown by (495), where there is modification by an adverb meaning 'quickly'. Contrast (496), a clear stative, where the same adverb is impossible.

(495) Ọba ahụ kụ wa -ra ọsịịsọ.
gourd that strike split -FACT quickly
'That gourd quickly split as a result of striking.'

(496) # Ọ dị ngaa ọsịịsọ.
3sS be here quickly
Literally: 'S/he is here quickly.'

There is therefore no reason why these predicates should not be subject to A/E. We must conclude that this principle, and with it RHL's account of transitivity in CCs, is invalidated by the facts of Igbo.

This conclusion can also be related to a more common idea, already suggested in McCawley 1971 and Dowty 1972: the idea that introducing a "causing event" (i.e. the means event) implies introducing an agent, the agent of the causing event. Igbo demonstrates that there is no such implication, not universally. A predicate may describe a causative relation between two events, without having any need for an agent argument in syntax. Related observations are developed in Pylkkänen 2002.

Chapter 4

Word order in complex causatives

4.1 Introduction

This chapter turns to surface syntax. Basic word order in CCs varies in two ways. In VO languages, the direct object is sometimes between the heads of M and R, English (497), and sometimes after, Mandarin (498). In OV languages, R sometimes precedes M, Kannada (500), and sometimes follows, Ijọ (499).

(497) Al pounded it flat.

(498) Lǎo Wèi zá píng -le nà kuài ròu.
L.W. pound flat -PFV that chunk meat
'Lao Wei pounded the meat flat.'

(499) Hari tanna pyjamaga -lannu shubrav -aagi tol -id -a.
H. his pyjamas -ACC clean -ADV wash -PAST -3sm
'Hari washed his pyjamas clean.'

(500) Erí bẹ́lẹ sụ̀rụ pámọ -mị.
he pot wash clean.CAUS -PAST
'He washed the pot clean.' (ex. & tr. Williamson 1965: 57)

Section 4.2 concerns the first contrast, and section 4.3, the second.

There have been many provocative discussions in both areas: e.g. Déchaine 1993 and Stewart 2001 in the first, Nishiyama 1998 and Carstens 2002 in the second. But often, the principles proposed to account for a difference between one pair of languages fail to extend to others. Or the patterns are described in terms that, in this work, I have found to be counterproductive. I think it will be valuable, therefore, both to report results from a fairly broad survey of languages, and to view the data through the lens of my own premises, those presented in chapter 1.

I find a correlation between surface word order and the size of R. As we know, R is sometimes a head (X_o) and sometimes a phrase ($\overline{X}$ or XP). I say that it is a head when it cannot include modifiers, and a phrase when it can. In VO languages, this difference decides whether M and R are adjacent or separated by the object. And in OV languages, it decides whether R precedes M or follows. The latter observation goes against a bias in the literature, which often links order not to size of R, but to its category. And both observations show it must be wrong to presume, as many do (e.g. Déchaine 1993, Sybesma 1999, Collins 2002, Carstens 2002), that R is always a phrase underlyingly, since this makes the cross-linguistic patterns needlessly mysterious.

I show that the observed correlations are expected given just very plain assumptions, mainly those we have made already. CCs are complex predicates, with the direct object generated outside. In some CCs, R is a phrase, and in some it is a head. And in the latter case, the resulting complex head, $[_{V_o}V^M[$ CAUSE $X^R]]$, is linearized with M preceding R. With little more than this, we have an simple explanation for the observed patterns in word order.

In section 4.4 I comment briefly on a class of apparent exceptions to the conclusions of sections 4.2 and 4.3, found in the Yiish (Loloish) subgroup of Tibeto-Burman.

As always, my goal in this chapter is to discern what is common to CCs across languages, and to describe the differences as directly as possible. Even more than before, however, my sight is limited. I consider an array of languages in which I am not expert, and thus allow myself hypotheses for which I have, all things considered, scant evidence. Yet the data I can see show patterns that seem worth reporting, if only to stimulate future work.

For ease of reference, here is a list of the languages and some of the literature from which I draw my impressions, broken down by language family. Mistakes I make should not, of course, be attributed to any of the cited sources.

1. Benue-Congo: Igbo, Edo (Stewart 2001), Yoruba (Bamgboṣe 1965, Awoyale 1988), and Ijọ (Williamson 1965, Carstens 2002)

2. Sinitic (B. Huang 1996, Lamarre 2001): Mandarin, Shanghainese (Xu and Tang 1988, Qian 1998), and Cantonese (Matthews and Yip 1994, Yue 2001)

3. Tibeto-Burman:

   (a) Karen: Kayah Li (Solnit 1997)

   (b) Kuki-Chin: Mizo (Chhangte 1989, 1993)

   (c) Burmish: Burmese (Huffman 1967, Okell 1969, Wheatley 1982, Goral 1986), Achang (Dai and Cui 1986)

   (d) Yiish (Loloish): Nosu Yi (Li and Ma 1982, Chen et al. 1985, Ding 1993, Fu 1997, Chen and Wu 1998), Hani/Akha (Wheatley 1985, Hansson 1985, Li and Wang 1986), Lisu (Wheatley 1985, Xu et al. 1986, Bradley 2003), Lahu (Matisoff 1969, 1976; Chang et al. 1986), Lalo (Björverud 1998)

4. Tai: Dai (Yu 1980), Zhuang (Wei 1980), Dong/Kam (Long and Zheng 1998), Thai (Filbeck 1975, Bisang 1992)

5. Vietnamese (Thompson 1965, Hai 1975, Kuhn 1990, Bisang 1992, Nguyen 1997)

6. Khmer (Jacob 1968, Gorgoniyev 1966, Goral 1986, Schiller 1990)

7. Japanese (Washio 1997, Nishiyama 1998, Iwasaki 2002)

8. Oceanic (Foley and Olson 1985, Durie 1994, Crowley 2002): Paamese (Crowley 1982, 1987), Hyslop (2001)

9. Dravidian (Krishnamurti 2003): Kannada (Sridhar 1990, Schiffman 1984, Lidz 1998, 2001), Malayalam (Asher and Kumari 1997)

4.2 Continuity and the size of R

Among VO languages, there are two possible word orders for CCs. In the *continuous order* the object follows the heads of both M and R, (501). In the *discontinuous order* the object intercedes, (502). In both types, M precedes the head of R; this is universal among VO languages.

(501) Continuous order for VO languages
M R OBJECT

(502) Discontinuous order for VO languages
M OBJECT R

Some VO languages, like Igbo, have only CCs with the continuous order. Some, like Edo (Stewart 2001), have only CCs with the discontinuous order. And others, like English and Vietnamese, allow both orders, under certain conditions.

What decides the choice between these orders, I propose in section 4.2.1, is the size of R, head or phrase. I give a formal account of this correlation in 4.2.2 and indicate problems with alternatives in 4.2.3. Section 4.2.4 briefly considers OV languages,

where the heads of M and R are never separated by the object, except in special cases.

4.2.1 Patterns in the data

To my knowledge, the generalization in (503) has no exceptions. Continuous order is required if and only if R is constrained to be a lexical head.

(503) Continuous order is mandatory if and only if R cannot be phrasal.

I have seen no CC in any language which allows R to be modified, and hence is phrasal, but has the continuous order mandatorily. Thus the pattern represented by (504) is not grammatically mandatory in any language.

(504) He pounded extremely flat every single cutlet we gave him.

Nor have I seen any CC which forbids modification of R absolutely, but permits the discontinuous order. When the discontinous order is permitted, so is modification of R. The CCs of Mandarin and Igbo are therefore representative cases, both of CCs with mandatorily continuous order, and of CCs where R is constrained to be an unmodified head.

(503) implies that discontinuous order is *possible* just when R is phrasal. But what about cases where discontinuous order is not only possible, but mandatory? Based on the languages I have surveyed, I believe we can say (505) as well.

(505) Discontinuous order is mandatory if and only if R is phrasal.

But we will need to distinguish between *basic* and *nonbasic* orders; (505) applies only to basic discontinuous order. A basic order is available by default, while a nonbasic order depends on special features of prosody or pragmatics. In this context, the only special features that will matter are those of the direct object. Certain word orders

occur just when the object is prosodically light, others, only when it is prosodically heavy. These are therefore nonbasic.

With this in mind, let's consider the two parts of the biconditional in (505) separately, beginning with (506). To this generalization, I have seen no challenges.

(506) If (basic) discontinuous order is mandatory, then R is phrasal.

One instance of (506) is provided by Edo, a Benue-Congo language studied extensively in Stewart 2001. Stewart gives (507) as an exemplary Edo CC; his term "resultative serial verb construction." Here discontinuous order is mandatory. The two predicate heads, koko 'raise' and R is mose 'beautiful,' must be separated by the object, and cannot be adjacent, (508). And as (506) predicts, the head of R can be independently modified, yielding a phrase, (509).

(507) Ozo koko Adesuwa mose.
O. raise A. beautiful
'Ozo raised Adesuwa to be beautiful.' (ex. & tr. Stewart 2001)

(508) * Ozo koko mose Adesuwa
O. raise beautiful A.
Intended: same as (507).

(509) Ozo koko Adesuwa mose vbe Iyoba.
O. raise A. beautiful like queen mother
'Ozo raised Adesuwa to be beautiful like the Queen Mother.'
(O.T. Stewart, p.c.)

To my knowledge, Edo is a representative case. I know of no CC where the discontinuous order is mandatory, but R can never be modified.

An apparent exception comes from Shanghainese, a Sinitic language of the Wu branch, spoken mainly in Shanghai (Xu and Tang 1988, Qian 1997). Some CCs in Shanghainese have discontinuous order mandatorily; compare (510) to (511). Yet here R cannot be modified, (512).

(510) ŋu^{23} sɔ^{53} ɦi^{23} su^{53}
I cook it crisp
'I cook it crisp.' (Xu and Tang 1988: 480, Huang 1996: 735)

(511) * ŋu^{23} sɔ^{53} su^{53} ɦi^{23}
I cook crisp it
Intended: 'I cook it crisp.'

(512) * ŋu^{23} sɔ^{53} ɦi^{23} čjɔ gwe su^{53}
I cook it very crisp
'I cook it very crisp.' (Libin Shen, p.c.)

This is not a clear exception, however, since the discontinuous order is possible only when the object is a monosyllabic pronoun (Xu and Tang 1988: 480–481, B. Huang 1996: 735, Qian 1997: 268).[1] When it is nonpronominal or polysyllabic, the continuous order is required. So the discontinuous order is nonbasic; in fact it is optional as well.[2] And therefore Shanghainese does not violate (506). Its mandatory *basic* order is continuous, and as we expect in such cases, R cannot be phrasal.

Now consider the converse of (506), namely (513).

(513) If R is phrasal, then (basic) discontinuous order is mandatory.

At first this seems to have exceptions. We do find CCs where R is a modified phrase, and yet surfaces adjacent to M. English (514) (=(504)) and Vietnamese (515) are examples.

[1] B. Huang 1996: 735 implies that the order is sometimes available to monosyllabic nouns as well, but he gives no examples. My Shanghainese consultant found all cases with nouns very awkward. In any case, even if some monosyllabic nouns are possible in the discontinuous order, the order would still be nonbasic.

[2] Historically in Sinitic, the M-Object-R order preceded the M-R-Object order that is required in modern Mandarin. Many languages other than Mandarin, especially in the southern groups, have preserved the older order to some degree. So the Shanghainese pattern with object pronouns can be considered a historical relic, restricted just to cases where the object is pronominal. For the history of the CC in Sinitic, see Mei 1991, Shimura 1995, Yue 2001, and Shi 2002. Word order variation among the CCs of modern Sinitic languages is complex, and I cannot address it here; see B. Huang 1996 (733ff.) and Lamarre 2001.

(514) Al pounded extremely flat every single cutlet we gave him.

(515) Tôi nấu thật mềm miếng thịt này.
I cook very soft CLS meat that
'I cooked very soft that piece of meat.'

As implied by (503), however, such examples never instantiate a mandatory word order pattern. So far as I know, the discontinuous order is always a syntactically possible alternative, (516,517).

(516) Al pounded every single cutlet we gave him extremely flat.

(517) Tôi nấu miếng thịt thật mềm.
I cook CLS meat very soft
'I cooked the piece of meat very soft.'

Moreover, if English and Vietnamese are representative, orders like this are always nonbasic.

For English, it is well known that continuous order favors a prosodically heavy object noun phrase, one that is either long, (518b), or contrastively stressed, (518c). Pronominal objects are entirely out (518d).

(518) a. ? Al pounded flat the cutlets.

b. Al pounded flat every single cutlet we gave him.

c. Al pounded flat *the cutlets*.

d. * Al pounded flat it.

More importantly here, when R includes modifiers, a very heavy object is absolutely necessary. (514) contrasts sharply with (519).

(519) * Al pounded extremely flat the cutlets.

So discontinuous order is basic in English, and continuous order is nonbasic, particularly when R actually includes modifiers.

I will presume that the nonbasic order is derived by rightward extraposition of the object, from a structure that would otherwise surface with the basic order, (520). Such extraposition is of course motivated independently, outside the domain of CCs, for cases like (521).

(520) Al pounded t_i extremely flat [every single cutlet we gave him]$_i$.

(521) Al flattened t_i quite effectively [every single cutlet we gave him]$_i$.

Below in section 4.2.2, I will come to how the basic surface order is derived from the presumed underlying structure; in brief, the means verb raises to v.

A similar case can be made for Vietnamese.[3] Here one sometimes finds variation between the discontinuous order (522) and the continuous order (523).

(522) a. Tôi giặt cái quần sạch.
1s wash CLS pants clean
'I washed the pants clean.'

b. Tôi nấu miếng thịt mềm.
1s cook CLS meat soft
'I cooked the meat soft.'

c. ?? Tôi rán cha giò giòn.
1s fry springroll crisp
'I fried the springroll crisp.'

(523) a. Tôi giặt sạch cái quần.
1s wash clean CLS pants
'I washed the pants clean.'

[3]The Vietnamese data in this section come from Thai Van Nguyen, who teaches Vietnamese at the University of Pennsylvania's Penn Language Center. The assignment of asterisks and question marks indicates my understanding of his judgments.

b. Tôi nấu mềm miếng thịt.
1s cook soft CLS meat
'I cooked the meat soft.'

c. Tôi rán giòn cha giò.
1s fry crisp springroll
'I fried the springroll crisp.'

Yet the difference appears to reflect the syntactic size of R, as we expect. When the order is discontinuous, R naturally accommodates modifiers, (524). Indeed, inclusion of modifiers is often preferred; (524c) is judged better than (522c).

(524) a. Tôi giặt cái quần rất sạch.
1s wash CLS pants very clean
'I washed the pants very clean.'

b. Tôi nấu miếng thịt thật mềm.
1s cook CLS meat really soft
'I cooked the meat real soft.'

c. Tôi rán cha giò rất giòn.
1s fry springroll very crisp
'I fried the springroll very crisp.'

But when the order is continuous, modification of R is not possible—not in what seems to be the basic or general case, (525).

(525) a. ?* Tôi giặt rất sạch cái quần.
1s wash very clean CLS pants
Intended: *'I washed very clean the pants.'

b. ?? Tôi nấu thật mềm miếng thịt.
1s cook real soft CLS meat
Intended: *'I cooked really soft the meat.'

c. * Tôi rán rất giòn cha giò.
1s fry very crisp springroll
Intended: *'I fried very crisp the springroll.'

It is possible only under special circumstances, namely when the object noun phrase is long and/or bears strong contrastive focus, (526).

(526) a. Tôi giạt rất sạch cái quần tràng này.
1s wash very clean CLS pants white these
'I washed very clean *these* white pants.'

b. Tôi nấu thật mềm miếng thịt này.
1s cook really soft CLS meat that
'I cooked *that* meat really soft.'

c. ?* Tôi rán rất giòn cha giò này.
1s fry very crisp springroll that
Intended: 'I fried *that* springroll very crisp.'

So when R is phrasal, the continuous order is nonbasic, and the discontinuous order is basic. Thus Vietnamese has two syntactically distinct CC constructions, differing in the size of R, and consequently, in their basic word order.

Again I will derive the nonbasic order by rightward extraposition of the object, (527). If extraposition did not apply, the structure would surface with discontinuous order.

(527) Tôi giạt t_i rất sạch [cái quần tràng này]$_i$
1s wash very clean CLS pants white these
'I washed very clean *these* white pants.'

When the order is discontinuous, but R includes no modifiers, as in (522), I assume that R is nevertheless a phrase: the phrase happens to include just its head. But when R is unmodified and the order is continuous, as in (523), I assume that R is just

a head. It is not phrasal, since it cannot, in the basic case, be expanded to include modifiers. Thus Vietnamese follows the scheme in (528).

(528) a. When R is phrasal:

i. V^M - OBJECT - VP^R

Basic order.

ii. V^M - VP^R - OBJECT

Nonbasic order, derived from (528a-i) by extraposition.

b. When R is a head:

V^M - V^R - OBJECT

Basic order; no nonbasic order available.

In sum, then, both directions of the biconditional in (505) are supported, as long as we take the generalization to govern basic orders. And (529) is thus our comprehensive hypothesis about the word order of CCs among VO languages.

(529) a. Continuous order is mandatory if and only if R is phrasal.

b. (Basic) discontinuous order is mandatory if and only if R is not phrasal.

Some final support for these correlations can be found in the serial verb constructions of Oceanic languages (Crowley 2002), of which CCs are one type. I will limit my observations to Paamese (Crowley 1987) and Ambae (Hyslop 2001), both languages spoken on Vanuatu.

In these languages, some types of SVC have discontinuous order, with an object interceding between the verbs. Others have continuous order, with adjacent verbs followed by an object. When the order is discontinuous, both verbs are marked for tense (or mood) and agreement.[4] But when the order is continuous, the verb

[4]Crowley and Hyslop are careful to show that, despite the two markings of tense and agreement, such constructions are clearly distinct from VP coordinations.

group shares a single set of markings. This suggests that the second(ary) predicate is syntactically *larger* in a discontinuous SVC than in a continuous SVC. In the former, it contains structures relating to tense and agreement (though not, argue Crowley and Hyslop, an NP argument position). In the latter it is just a solitary V_o. Thus continuous order goes with a lexical secondary predicate, and discontinuous order with a phrasal secondary predicate, echoing the correlation in the domain of CCs.

Crowley (1987, 2002) discusses one case in Paamese that is of special interest here. He compares (530) and (531). (530) has discontinuous order, and both verbs, uas 'hit' and mat 'die,' are marked for tense and agreement. (531) has continuous order, so there is only one marking of tense and agreement for both sal 'to spear' and vini: 'to kill.'

(530) inau n- uas vuas he:- mat.
1s 1s:DIST.FUT- hit pig 3s:DIST.FUT- die
'I will hit the pig to death.' (ex. & tr. Crowley 2002: 55)

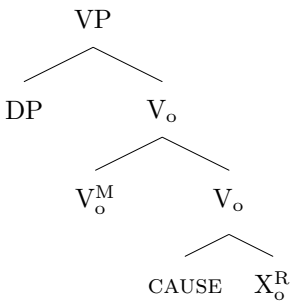
(531) i- sal vini: -n vuas.
3p:DIST.FUT- spear kill -OBJ pig
'They will spear the pig to death.' (ex. & tr. Crowley 2002: 83)

In both sentences, the understood relation between the events of the two verbs is causation, and there is no overt indication of coordination or subordination. Thus we can see Paamese, like Vietnamese, as exemplifying in one language the two main types of CCs. One with discontinous order where R is a phrase, and one with continuous order where R is a head.

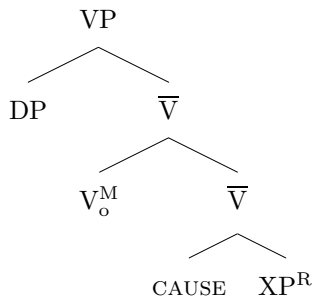
4.2.2 Explaining the pattern

Throughout this work I have made three basic syntactic assumptions, embodied in (532).

(532) a.



b.



CCs are complex predicates, where the means verb combines immediately with R, or more precisely, with [CAUSE R]. The direct object DP is generated outside the minimal CC predicate, in a position that asymmetrically c-commands the base positions of both M and R. And finally, R is sometimes a head (X_o), and sometimes a phrase (XP or maybe $\overline{X}$), a constituent which can accommodate adverbial modifiers. When two heads combine, the result is itself a head; but when a phrase combines with anything, the result is also a phrase. Thus when R is an X_o, the minimal CC predicate is an X_o as well, specifically a V_o, (532a). But when R is phrase, the minimal CC predicate is a phrase as well, a $\overline{V}$, (532b). (For concreteness, I assume that the constituent containing CAUSE and R is either a V_o or a $\overline{V}$, depending on whether R is a head or a phrase. But the grounds for this choice of category label are uncertain.)

These structural premises played a role in chapters 2 and 3, where I discussed the semantic structure of CCs. If the object is outside the complex causative predicate, the grammar can assign it the patient relation to the event of causation, an assumption which both simplifies the account of Mandarin and Igbo, and facilitates attractive cross-linguistic generalizations. And differences in the size of R, I argued in chapter 2, have *no* direct effects on semantic structure, contra one common opinion.

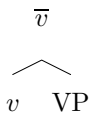
Now we'll see that the same premises provide a simple account of the cross-linguistic patterns in word order, given (533) and (534).

(533) A complex head [X [CAUSE Y]] is pronounced XY.

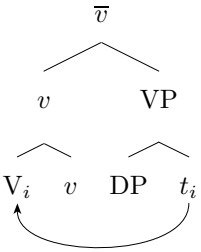
(534) Typically in VO languages, a head precedes a phrase in its sister.

Two further assumptions must first be made explicit, neither particular to the analysis of CCs, and both conventional within my general framework. First, I presume that verb raising to v is mandatory. Given a structure like (535), the most local V_o within VP must adjoin to v. (536) illustrates a basic case, where VP contains a direct object and a simple V predicate. In VO languages, this is a necessary concomitant of assuming that the direct object is generated in the specifier of VP, an assumption that has been useful in this work.[5]

(535)



(536)



Second, I presume that any operation of rightward noun phrase extraposition is optional. That is, its application will respond to factors that are not strictly syntactic, such as phonological weight, or prosodically-marked focus. The cases of extraposition proposed above, for English and Vietnamese, are thus exemplary.

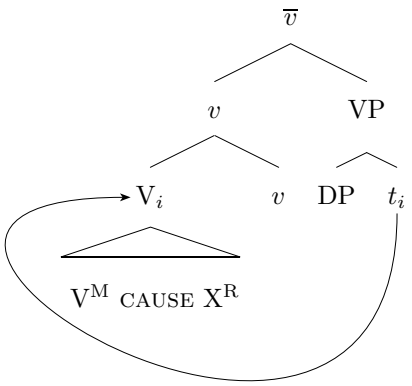
When R is a head

When R is a head, M-R-OBJECT surface order reflects nothing but obligatory verb raising to v, (537). It is the entire compound V that moves, because this is the

[5]By assuming that the direct object occupies a specifier, we can generalize over both V and $\overline{V}$ predicates. We can also assume that the direct object occupies the same position in both simple and double-object unaccusatives.

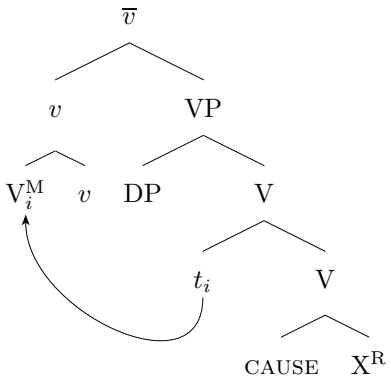
maximal V_o in v's sister VP. The structure is pronounced M-R-OBJECT, given the linearization pattern described in (533). (I'll suggest a formal explanation for (533) in section 4.3.3 below.)

(537)



To directly derive the unattested M-OBJECT-R order, it would be necessary to move the means verb alone, (538).

(538) *



But this violates the locality conditions on head movement. Movement to a head Y_o is available only to the closest X_o in Y_o's sister XP. Thus the complex causative V_o can move to v, but the means verb cannot, since it is embedded within that complex head. (Of course the same goes for the R head.) Putting it differently, a complex head is an island for head movement, and so 'excorporation' of the means verb out of the complex causative V_o is impossible.

Discontinuous order might be derived by means of a transformation that is sensitive to extrasyntactic factors. For example, it might arise by encliticization of a light

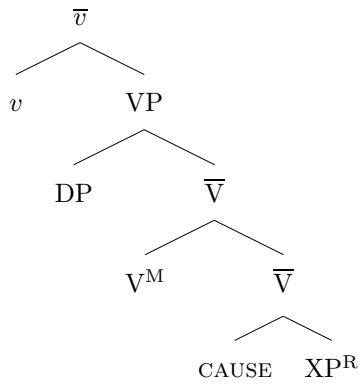
object pronoun to the means verb. But then the order would not be basic, and could not be mandatory in the general case.

Thus when R is a head, the discontinuous order is underivable, and the basic order must be continuous, just as the facts of section 4.2.1 tell us.

When R is a phrase

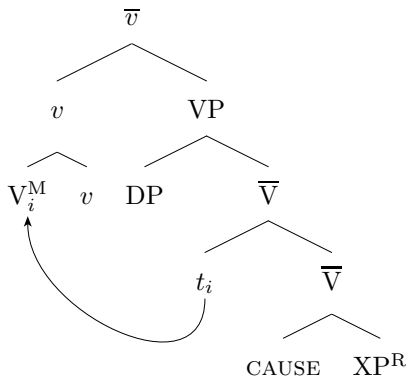
When R is a phrase, the CC predicate is phrasal too, a $\overline{\text{V}}$, (539).

(539)



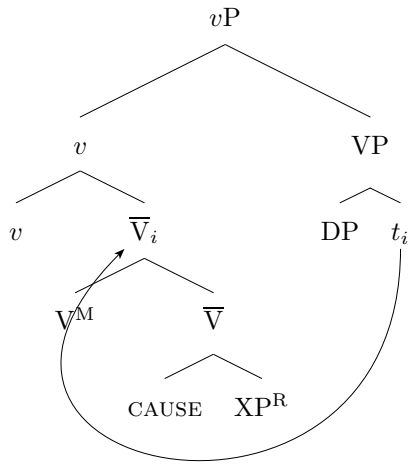
The V_{o} most local to v is therefore not the CC predicate, but the means verb. As a result, movement of the means verb alone is licit, (540), and yields the discontinuous order, since heads precede sister phrases in VO languages, (534). (Compare the derivations of discontinuous order in Bach 1981 and Hoeksema 1991.)

(540)



Movement of the entire CC predicate would be improper in any case, since it is a $\overline{\text{V}}$. A phrase cannot move to a head, (541). (Also note that if the result XP were to contain an anaphor coindexed with the direct object, it would fail to be bound.)

(541) *



Thus continuous order with phrasal R cannot be derived by verb movement. It might be derived by applying object extraposition to (540), the structure that results from raising the means verb, but in that case the order would be nonbasic. So if it is available when R is phrasal, continuous order will always be nonbasic. And if any basic order is mandatory, it must be the discontinuous order. Again, this is what we observed in section 4.2.1.

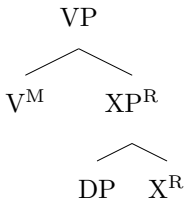
4.2.3 Alternatives and their problems

I presume that CCs are complex predicates, with the direct object generated outside. And I observe that R may be either a head or a phrase. This gives us the continuous order directly, with the discontinuous order derived by raising of the means verb. The result is a simple explanation of the observed patterns in word order.

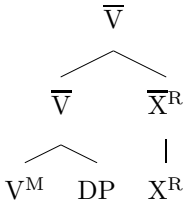
Some other theories begin with different premises. (542) is a Small Clause analysis; Sybesma 1999 proposes basically this for Mandarin. (543) is the analysis Déchaine 1993 (pg. 243) has for Igbo and Yoruba (see also Manfredi 1991). By hypothesis,

these structures give us the discontinuous order directly. It is the continuous order that must be derived.

(542)



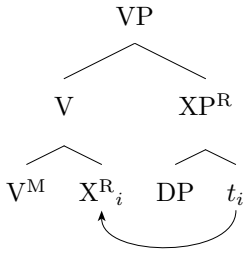
(543)



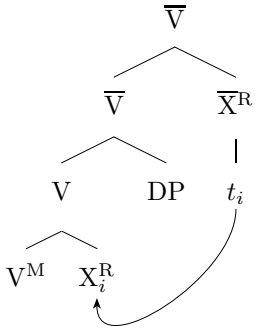
Assuming either sort of structure, I believe, makes it difficult to explain the correlation between continuity and the size of R.

Given (542) or (543), continuous order might be derived by extraposition of the object. But the literature appears to accept that extraposition could yield only a nonbasic order. Where continuous order is basic, therefore, it is typically derived by *incorporation*. The head of R adjoins to the M verb, (544,545).

(544)



(545)



Incorporation is movement of one head to another, when neither is affixal, and both have phonological content. It is clear that languages differ in whether (or where) they allow incorporation. For example, German does not allow incorporation of verb roots into complementizers. If it did, one could not explain why the presence of an overt complementizer blocks raising of the verb to C. French does not allow incorporation of main verbs into auxiliaries. If it did, one could not explain why the presence of an overt auxiliary blocks raising of the verb to T. But if continuous order is always derived by incorporation, as (542) and (543) suggest, then it must be that every CC whose basic order is continuous (at least when R is nonphrasal) is from a language that allows incorporation of one verb into another—not compounding (direct generation of two heads as sisters), but incorporation (movement of one free root to another). This strikes me as implausible. Yet for the sake of argument, let us suppose that it is not implausible, but true. Even then, it is difficult to explaining the cross-linguistic patterns with (542) and (543).

To capture these patterns, it will be necessary to force incorporation of R into M in some cases, and forbid it in others. Specifically, incorporation must be forced when R is nonphrasal (i.e. not modifiable); then it will follow that nonphrasal R implies continuous order. And incorporation must be forbidden when R is phrasal; then it will follow that phrasal R implies discontinuous order.

But on what grounds could these restrictions be motivated? Analyses like (542) and (543) presume that R is always a phrase. In Sybesma's (542), R contains both the predicate head and a DP argument. For Déchaine's (543) as well, R is large enough accommodate a DP argument for its head, and according to Déchaine (1993: 243) it actually does contain a DP argument in certain cases I will not discuss here. The underlying structure is therefore one which could in principle contain modifiers of R. Thus incorporation must be forbidden just when there *happens* to be a modifier, and

forced just when there *happen* to be no modifiers. I see no way to accomplish this except by outlawing the stranding of modifiers, a stipulation with no clear grounds. Or let me put my criticism differently. The theories represented by (542) and (543) must ensure that modifiers are never stranded. But stranding of modifiers would be the clearest sort of evidence in favor of the movement they posit (see Baker 1988). And a theory that outlaws the very condition that would confirm it is not likely to be persuasive.

Separate from the problem of stranding modifiers, there are no clear motives for forcing movement of R to M. By hypothesis, whether the head of R is fated to move or fated to remain in situ, it occupies the same underlying syntactic context. So the two fates could be decided only relative to intrinsic properties of the head itself. Déchaine (1992, 1993) proposes a criterion for the choice in her comparison of Igbo and Yoruba. CC word order is continuous in Igbo, but discontinuous in Yoruba. Déchaine develops the claim that, in Igbo but not in Yoruba, verb roots are morphologically dependent. They must either combine with an affix, or compound with another root. Incorporation in Igbo CCs is just a way of satisfying this requirement. Languages with discontinuous order are those whose roots can stand alone, unaffixed and uncompounded.

Regardless of whether this works for Igbo and Yoruba, it is unlikely to work in general. It clearly fails to account for Mandarin. Mandarin verbs have no trouble standing on their own, like sǐ 'die' in (546), and yet the same verbs appear in CCs with continuous order, (547).

(546) rúgǔo tā sǐ, wǒ jiù bù gāoxing.
if 3s die, 1s then not happy
'If s/he dies, I will be unhappy.'

(547) tā dǎ sǐ -le wǒ -de lǎoshī.
3s strike die -PFV 1s -NMOD teacher
'S/he beat my teacher dead.'

Nor is it likely, I wager, to account for the contrast between Mandarin and, say, Tai languages like Thai or Dai, which have discontinuous order mandatorily.[6] Mandarin (548) is the translation of Dai (549) given in the source text. I doubt that the morphological properties of Mandarin verb roots can be sufficiently distinguished from those of verb roots in Dai to make the distinction Déchaine would need.

(548) dà fēng chūi duàn -le shù zhī.
big wind blow snap -PFV tree branch
'A strong wind made the branches snap by blowing.'
(Yu 1980: 90, tr. AW)

(549) lum^{2} loŋ^{1} pat^{8} xa^{6} mai^{4} xaːt^{9} lɛu^{4}.
wind big blow tree branch snap PFV
'A strong wind made the branches snap by blowing.'
(Yu 1980: 90, tr. AW)

The case of Vietnamese is conclusive. Consider again the sentences in (550) and (551). Surely there are not two verbs giòn 'crisp,' one that is morphologically dependent and one that is not. So either giòn 'crisp' must incorporate into rán 'fry,' making (550) the unique basic order, or it must remain in situ, and (551) is the unique basic order.

(550) Tôi rán giòn cha giò.
1s fry crisp springroll
'I fried the springroll crisp.'

[6]For discussion of Mandarin influence on word order in the CCs of Zhuang, a major Tai language of China, see Wei 1980: 77. For similar discussion of sinicization in the northern dialect of Dong (autonym Kam), a language in the Kam-Sui branch of Tai, see Long and Zheng 1998: 167–168, which is written in English. If the correlation I observe between continuity and the size of R is correct, the Tai languages which are adopting Mandarin order will (eventually) lose the ability to modify R.

(551) Tôi rán cha giò rất giòn.
1s fry springroll very crisp
'I fried the springroll very crisp.'

But neither consequence is acceptable. If incorporation is necessary, then the discontinuous order could only be derived by subsequent *ex*-corporation, an absurd result. If the discontinuous order is basic, the continuous order would have to be derived by extraposition of the object. In that case, the continuous order should allow modifiers in R unconditionally, as does the discontinuous order. But this is plainly false, (552).

(552) * Tôi rán rất giòn cha giò.
1s fry very crisp springroll
Intended: ?*'I fried very crisp the springroll.'

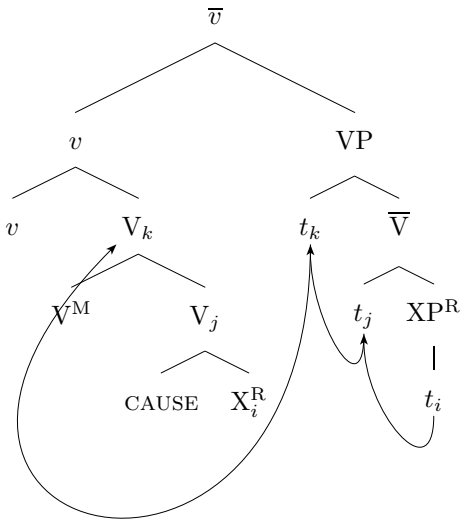
Vietnamese thus spotlights the basic problem. The choice between continuous and discontinuous order cannot be decided by lexical properties of the predicate head. Yet it can be decided, quite simply, based on properties of its structural context: we have the discontinuous order when the predicate heads its own phrase, and the continuous order when it joins (CAUSE and) M directly. So a theory that fails to allow that there could even be such a contrast, like Sybesma's or Déchaine's, cannot possibly explain the word order facts straightforwardly.

I conclude from the relative success of the theory in section 4.2.2 that structural premises laid out in chapter 1 have some cross-linguistic support.

I think the facts warrant a further conclusion concerning the possibility of incorporating movement in CCs. When R is phrasal, continuous order is never mandatory. And when it does obtain, as a nonbasic order, we never find an adverb following the object, but modifying R. This is explained directly if the incorporating movement that would allow this surface structure is impossible, (553): when R is phrasal, its head cannot incorporate (into CAUSE and then) into the head of M, with the resulting

complex head subsequently raising to v. I leave it as an open question what general principle might account for this.[7]

(553) *



4.2.4 Continuous order in the OV languages

Among OV languages, there is no variation between continuous and discontinuous order. The object always precedes the heads of both M and R, (554), and never intervenes between them, (555). (There are apparent exceptions in the Yiish languages, but I accommodate these in section 4.4.)

(554) Continuous orders for OV languages

a. OBJECT M R

b. OBJECT R M

(555) Discontinuous orders for OV languages (unattested)

a. * M OBJECT R

b. * R OBJECT M

[7] My own inclination would be to say simply that there is no such thing as incorporation, *pace* Baker (1988) and others. The facts incorporation is meant to account for should instead be modeled without movement, by base-generating complex heads directly. See Embick and Noyer 2001.

(556) is an example from from Akha (a central Yiish/Loloish language), and (557) is an example from from Ijọ (a Benue-Congo language).

(556) àjɔ̀q àzàq dì sɛ̀q mɛ́.
he pig beat kill PRT
'He will kill a pig.' (ex. & tr. Hansson 2003: 242)

(557) Erí bẹ́lẹ sù̱rụ́ pámọ -mị.
he pot wash clean.CAUS -PAST
'He washed the pot clean.' (ex. & tr. Williamson 1965: 57)

Topicalization, and processes like V-to-C raising, may create surface orders that are discontinuous, as in the German (558b) and (558c). But the basic order is always continuous, (558a).

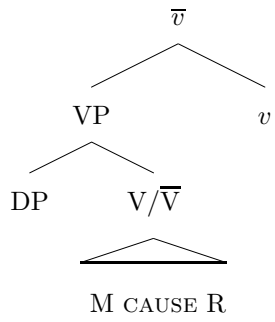
(558) a. Er hat es unheimlich sauber gewaschen.
He has it uncannily clean washed
'He washed it uncannily clean.'

b. Unheimlich sauber hat er es gewaschen.
uncannily white has he it washed
'Uncannily clean, he washed it.'

c. Er waschte es unheimlich sauber.
He washed it uncannily clean
'He washed it uncannily clean.'

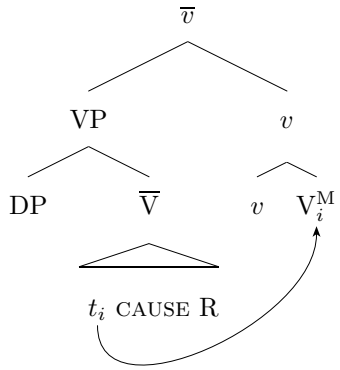
The lack of discontinuous order it is not surprising, if we continue to assume that the direct object noun phrase is generated outside the CC predicate. In a head-final language, this gives us (559) as the basic structure for for $\overline{v}$.

(559)

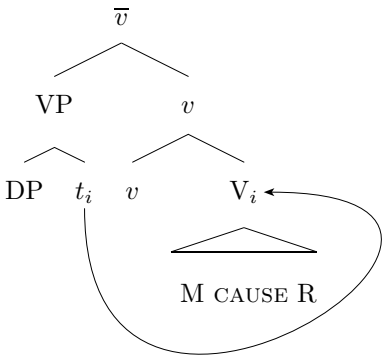


Starting with this, there is no way to derive basic discontinuous order. Regardless of what raises to v (or to any higher head) the object will not surface between the verbs. All the structures in (560) have M and R adjacent.[8] (I include the derivation in (c) for completeness, despite its being ill-formed.)

(560) a.

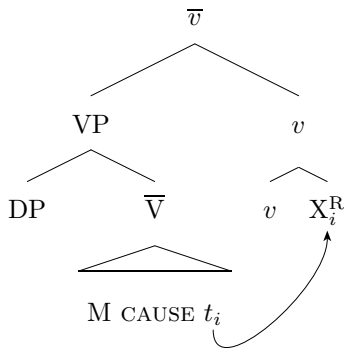


b.



[8]Notice that this is true even if we regard the object as a complement, rather than as a specifier, since both categories are to the left of the verb in an OV language.

c. *



Indeed, with the object outside the complex predicate, and VP surfacing to the left of v, the only way discontinuous order could arise is by its rightward extraposition, followed by raising of either M or R to a head that surfaces even further to the right. And even if this dubious sequence of operations were possible, it could not produce a basic word order, since extraposition could yield only a nonbasic order, by hypothesis.[9]

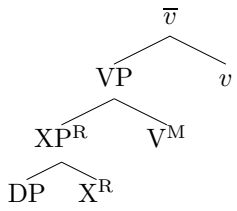
4.3 Verb order and the size of R

Among OV languages, the relative order of M and R varies. Sometimes R precedes M. This is the basic order in German (562) and Kannada (563), for example.

(562) ... weil er meine Unterhosen sauber gewaschen hat.
because he my underpants clean washed has
'... because he washed my underpants clean.'

[9]The impossibility of discontinuous order is also predicted by a Small Clause analysis like (561), provided that the result XP surfaces before the means verb, or before any head occupying v.

(561)



(563) Hari tanna pyjamaga -lannu shubrav -aagi tol -id -a.
H. his pyjamas -ACC clean -ADV wash -PAST -3sm
'Hari washed his pyjamas clean.'

And sometimes R follows M. This is required in, for example: Ijọ, (564); Mizo, (565); Nosu, (566); and Alamblak, (567) a Papuan language.

(564) Erí bẹ́lẹ sụ̀rụ pámọ -mị.
he pot wash clean.CAUS -PAST
'He washed the pot clean.' (ex. & tr. Williamson 1965: 57)

(565) keel -in pâl a- sû chia.
goat -ERG fence 3s- butt at bad
'The goat butted the fence and broke it.' (ex. & tr. Chhangte 1993: 143)

(566) ɬa^{33} tshi^{34} gu^{33} tshi^{33} bo^{34}ʂo^{33} o^{34}.
pants DEM CLS wash clean PRT
'These pants are clean from washing.'
Or perhaps: '*pro* made these pants clean by washing.'[10]
(Chen and Wu 1998: 85, tr. AW)

(567) tat -noh -më -an -r.
hit -die -REM.PAST -1s -3s
'I killed him by hitting (him).' (ex. & tr. Bruce 1988: 20)

Finally we sometimes find we both patterns in one language, depending on properties of R. Japanese is a commonly cited example, (568,569).

(568) kare -wa teeburu -o kirei -ni hui -ta.
he -TOP table -ACC clean -ADV wipe -PAST
'He wiped the table clean.' (ex. & tr. Washio 1997: 5)

(569) John -ga Mary -o uti korosi -ta.
J. -NOM M. -ACC shoot kill -PAST
'John shot Mary dead.' (ex. & tr. Washio 1997: 2)

[10]The Mandarin translation of (566) given in the source text is ambiguous between the two glosses I suggest here. I do not know whether the Nosu sentence is itself ambiguous in this way, however.

What decides this difference? One possible answer, seemingly presumed in much of the literature, is category. When R is a *verbal*, a verb or verb phrase, it follows M, as in Ijọ or Nosu. Otherwise it comes first, as in German or Kannada. There is evidence in favor of this idea, as we will see in the following subsection. But in the end it is contradicted by some facts from Japanese and Malayalam. What decides between M-R and R-M order seems rather to be, again, whether or not R is phrasal.

4.3.1 Order and the category of R

It seems to be true that, whenever R follows M in an OV language, R is a verb.

(570) If R follows M, R is a verb.

Thus in the Japanese (571), R follows M, and R is kuzusi 'to make out of shape,' a verb, as shown in (572). For this reason, Japanese CCs where R follows M are described as compounds of two verbs (Washio 1997, Nishiyama 1998).

(571) John -ga coat -o ki kuzusi -ta.
J. -NOM coat -ACC wear make out of shape -PAST
'John wore the coat and made it out of shape.'
(ex. & tr. Nishiyama 1998: 202)

(572) John -ga coat -o kuzusi -ta.
J. -NOM coat -ACC make out of shape -PAST
'John made the coat out of shape.'

The same is true in Ijọ. R in (573) is pamọ 'to make clean,' a verb derived from the stative verb pa 'to be clean' by addition of the 'causativizing' suffix -mọ.

(573) erí bẹ́lẹ́ sùrụ́ pámọ -mi.
he pot wash clean.CAUS -PAST
'He washed the pot clean.' (ex. & tr. Williamson 1965: 57)

In the Tibeto-Burman languages also, when R follows M, it is a verb.[11] Thus R in the Mizo (565) is chia 'to be bad', which, like all verbs, will serve as a main predicate without auxiliary support, (574).

(574) pâl â- chia.
fence 3s- bad
'The fence is broken' (ex. & tr. Chhangte 1993: 143)

Likewise in the Nosu (566), bo^{34}ʂo^{33} 'to be clean' is a verb, as shown by (575). Here bo^{34}ʂo^{33} acts a main predicate (no copula can be added to this sentence) and is negated directly by the negative infix -a^{21}-, just like any other verb, (576).

(575) ɬa̲^{55} bo^{34} -a^{21}- ʂo^{33} o^{34}.
pants 'cle-' NEG '-an' PRT.
'The pants are not clean.' (Chen and Wu 1998: 162, tr. AW)

(576) ŋo^{21} n̥o^{21} a^{21} bo^{21} o^{34}.
we 'wo-' NEG '-rk' PRT
'We will not work.' (Chen and Wu 1998: 138, tr. AW)

It should be noted, however, that when R follows M, this does not exclude adjectives from occurring as R—i.e. predicates which can modify nouns directly—so long as these so-called adjectives are a subclass of the verbs. This is the situation in many of the Yiish languages, including Nosu.

Thus there is support for the implication in (570). The problem is its converse, (577).

[11] Our Tibeto-Burman examples differ from Japanese and Ijọ in the transitivity of R. R verbs in Japanese and Ijọ are transitive, when the CC is itself transitive. But in Mizo and Nosu Yi, the verbs in R are necessarily intransitive. This restriction is not vacuous, since these languages have a productive causative alternation. So transitive alternates of state-change verbs are often available, but they are never used in R (With one small exception: in some Yiish languages, such as Akha, 'kill' is used in R instead of 'die,' (556). Interestingly, Igbo exhibits the same exception.) The more general question of why some languages, such as Japanese or ǂHoan or Ambae, require R to be headed by a transitive verb, when the CC is transitive, is addressed in Nishiyama 1998 and Collins 2002. I will say nothing about this here.

(577) ? Unclear: If R is verbal, then R follows M.

If the verbhood of R is what determines it position, this should be true as well. Whenever R is verbal, it should follow M. Contrapositively, whenever R precedes M, it should be nonverbal.

There are instances where (577) does hold. In German, for example, R is never headed by a verb, and R always precedes M. In (578), R is sauber 'clean.' (579) shows that this is not a verb, but an adjective.

(578) ... weil er meine Unterhosen sauber gewaschen hat.
because he my underpants clean washed has
'... because he washed my underpants incredibly clean.'

(579) ... weil meine Unterhosen sauber *(sind).
because my underpants clean *(are)
'... because my underpants are clean.'

Japanese also provides examples. In (580) R is kirei-ni 'clean.'

(580) kare -wa teeburu -o kirei -ni hui -ta.
he -TOP table -ACC clean -ADV wipe -PAST
'He wiped the table clean.' (Washio 1997: 5)

The stem kirei 'clean' itself is of a class known as the "nominal adjectives." These are stative predicates that require the copula da when acting as a main predicate; da is otherwise used only with nouns. When nominal adjectives occur as adnominal modifiers, they require the suffix -na, (582).

(581) sono teeburu -wa kirei *(da).
that table -TOP clean COP
'That table is clean.'

(582) kirei -na teeburu
clean -ATTRIB table
'a clean table'

The suffix -ni is required when nominal adjectives occur in relation to a verb or verb phrase. Thus kirei-ni serves as a manner adverb in (583) and as a secondary predicate of result in our CC example (580).

(583) kirei -ni odoru
clean -ADV dance
'dance beautifully'

Etymologically the -ni suffix derives from an inflected copula. But forms in -ni are not verbs themselves, since they cannot act as main predicates and bear tense inflection.

(584) * sono teeburu -wa kirei -ni -ta.
that table -TOP clean -ADV -PAST
Intended: 'That table was clean.'

Thus when R is a predicate in -ni, there is no sense in which R is verbal.

So (577) has true instances. But it is not true in general. There are cases where R is evidently a verb and yet precedes M. Consider Japanese R predicates in -ku, such as (585) and (586).

(585) John -wa niku -o yawaraka -ku ni -ta.
J. -TOP meat -ACC soft -KU boil -PAST
'John boiled the meat (very) soft.' (ex. & tr. Washio 1997: 9)

(586) John -wa pankizi -o usu -ku nobasi -ta.
J. -TOP dough -ACC thin -KU roll.out -PAST
'John rolled the dough thin.' (ex. & tr. Washio 1997: 9)

The class of stems to which this -ku attaches is often called the class of "adjectives" (Washio 1997, Iwasaki 2002). This is fair, insofar as the "adjectives" can modify nouns

without the help of the suffix -no/-na, (587), which is required in the attributive use of nouns and the "nominal adjectives."

(587) a. yawaraka -i niku
soft -NONPAST meat
'soft meat'

b. usu -i pankizi
thin -NONPAST dough
'thin dough'

The form taken by the "adjectives" in the attributive environment is instead the same form that they take in the predicative environment, (588).

(588) a. niku -wa yawaraka -i.
meat -TOP soft -NONPAST
'The meat is soft.'

b. sono pankizi -wa usu -i.
that dough -TOP thin -NONPAST
'That dough is thin'

But (588) also makes clear that the "adjectives" are furthermore verbs (Iwasaki 2002: 37), since they inflect for tense and do not take a copula. Thus they are better called "adjectival verbs." The paradigm of inflection for adjectival verbs is distinct from that for nonadjectival verbs, and smaller. But this means only there are two classes of verbs in Japanese, not that the adjectival verbs are not verbs. (589) shows yawaraka 'soft' inflected for past tense.

(589) niku -wa yawaraka -katta.
meat -TOP soft -PAST
'The meat was soft.'

As for the suffix -ku required in the R context, this is evidently an infinitive inflection (Iwasaki 2002: 40,62). There are three environments in which the -ku infinitive occurs: under negation (590); under the 'conjunctive' -te suffix, (591); and when the verb acts as a secondary predicate in relation to another verb. This last case subsumes both R predicates, (585,586), and manner adverbs, as in (592).

(590) niku -wa yawaraka -ku -na -katta.
meat -TOP soft -INFIN -NEG -PAST
'The meat was not soft.'

(591) niku -wa yawaraka -ku -te ...
meat -TOP soft -INFIN -CONJ
'The meat was soft and ....'

(592) John -wa booru -o yawaraka -ku nage -ta.
J. -TOP ball -ACC soft -INFIN throw -PAST
'John threw the ball gently.'

The language provides no reason to distinguish among the -ku forms in these various contexts. Nor is it unusual cross-linguistically to see infinitives assume adverbial functions; we will see the same pattern in Malayalam. One can conclude, therefore, that R predicates in -ku are nonfinite verb forms. And so (577), the converse of (570) is not universally true: R may be verbal, and yet precede M.

Malayalam presents a situation similar to that of Japanese. There is in Malayalam a CC construction where R is an intransitive verb suffixed with -e,[12] necessarily preceding the verb that serves as M. (593–595) are examples.

(593) aval̤ vastram ve̤ukk -e alakk -i.
she clothes whiten -NPP wash -PAST
'She washed the clothes white.' (Asher and Kumari 1997: 92)

[12]For clarity of presentation, I will associate allomorphic aspects of the Malayalam suffixes with the stem, leaving only what is common to all cases in the affix.

(594) avaḷ pappaṭam moriy -e kaacc -um.
she pappatam get crisp -NPP fry -FUT
'She will fry the pappatam crisp.' (K.A. Jayaseelan, p.c.)

(595) avaḷ ari poḍiy -e kutt -um.
she rice become powder -NPP pound -FUT
'She will pound the rice powdery.' (K.A. Jayaseelan, p.c.)

Semantically, the construction entails that the state described by R is achieved, and achieved by means of the M action. So (593) is true only if the clothes in fact became white, and washing was the cause; if the clothes remain dirty, then (593) is false, even if whitening of the clothes was intended.[13] As the causal interpretation is mandatory, but not signalled by any overt morpheme, the construction meets the description of a CC.[14]

Relevant here is the analysis of the -e suffix. The suffix is described variously as producing a "verbal participle" (Prabodhachandran Nayar 1972: 40) or an "infinitive" (Asher and Kumari 1997: 322); I gloss it as yielding a "nonpast participle" (NPP).

[13]Prabodhachandran Nayar (1972: 40) gives the example in (596):

(596) ellu muRiy -e paṇit -u
bone break -NPP work -PAST
'...worked so that the bone may break.' (*sic*, ex. & tr. Prabodhachandran Nayar 1972: 40)

Here it is not entailed that any bones actually broke. But this sentence is a common idiom, and is sensibly analyzed as involving metaphor (K.A. Jayaseelan, p.c.), rather like the English 'I worked my ass off.' On literal readings, these sentence would entail bones breaking and asses falling off.

[14]In the Malayalam CCs, replacing the R verbs with their transitive variants results in ungrammaticality. (597) replaces the intransitive moriye 'become crisp' from (594) with transitive morikke 'make crisp,' and is therefore ungrammatical.

(597) * avaḷ pappaṭam morikk -e kaacc -um.
she pappatam make crisp -NPP fry -FUT
Intended: 'She fried the pappatam crisp

This distinguishes the Malayalam CC from the more general serial VP construction, of which (598) is an example. Here we find transitive 'make crisp' in its so-called past participle form (glossed PP).

(598) avaḷ pappaṭam moriyicc -u kaacc -u.
she pappatam make crisp -PP fry -PAST
'She fried the pappatam, making it crisp.'

What matters is that the suffix appears to be a verbal inflection, and not a derivational morpheme that changes category.

Certainly the stems to which -e attaches are verbs. Thus veɭu- 'be(come) white' from (593), mori- 'be(come) crisp' from (594), and poḍi- 'be(come) powder' from (595) can head a clause and bear tense inflection, (600,601,602).[15]

(600) ii kuppayam veɭutt -u.
this dress whiten -PAST
'This dress became white.' (Asher and Kumari 1997: 456)

(601) pappaṭam moriɲɲ -u.
pappatam become crisp -PAST
'The pappatam has gotten crispy.'

(602) ari poḍiɲɲ -u.
rice become powder -PAST
'The rice has turned to powder.'

Unlike English participles in -ing or Japanese infinitives in -ku, Malayalam participles in -e never occur as the main verb of a clause. The phrases they head serve only as secondary or adverbial predicates; besides their use in R, they occur "in a variety of time clauses" where they "express the simultaneity of two actions" (Asher and Kumari 1997: 322), as in (603) and (604).

A serial construction can be used to talk about an event of causation, but the causative meaning is not intrinsic to the construction. It differs from CCs like (594) in two other ways. First, serial constructions allow a separate overt object for each verb, but CCs do not. And second, CCs require R to precede M, while a serial construction does not. That is, more precisely, either the verb that describes the means event, or the verb that describes the result event, can occur finally, and bear the main tense inflection. Thus (599) is grammatical, and can be used to talk about exactly the same event as (598). Compare my translations of the two sentences.

(599) avaḷ pappaṭam kaacc -u moriyicc -u.
she pappatam fry -PP make crisp -PAST
'She made the pappatam crisp, frying it.'

[15]In a few cases, the verb stem happens to be homophonous with a noun; for example, poḍi means both 'powder' and 'to turn to powder.' But in general the host for -e is a dedicated verb stem.

(603) acchan irikk -e amma maricc -u.
father be -NPP mother die -PAST
'Mother died while father was still alive.' (Asher and Kumari 1997: 82)

(604) ɲaŋŋaɭ nookk -i nilkk -e avan taaẓeekkə caaṭ -i.
1pEXCL look -PP stand -NPP he down jump -PAST
'He jumped down while we were looking on.' (Asher and Kumari 1997: 303)

Yet the internal structure of these phrases remains that of a *verb* phrase. In (603) and (604), for example, we see the verb in the -e form occuring with its normal arguments.[16] The -e is thus best regarded a nonfinite inflection assumed by the head of a verb phrase when that phrase occurs secondarily (or adverbially) in relation to another verb. And consequently, in Malayalam as in Japanese, we find verbal R predicates that precede M.

There is therefore reason to doubt that category decides the difference between M-R and R-M order. I would like to put forward the hypothesis that the decisive factor is size. R precedes M when it is phrasal, and follows when it is a head.

4.3.2 Order and the size of R

Whenever M follows R, R can be modified independently of M, showing that it is phrasal.

(605) If M follows R, then R is a phrase.

(606) gives an example from German; (607) and (608) are from Japanese.

(606) ... weil er meine Unterhosen unheimlich sauber gewaschen hat.
because he my pants uncannily clean washed has
'... because he washed my underpants incredibly clean.'

[16]Of course when the NPP of an intransitive verb occurs as R, it will 'share' its argument with a transitive verb in M, obscuring some of the distributional evidence for its category.

(607) a. kare -wa teeburu -o totemo kirei -ni hui -ta.
he -TOP table -ACC very clean -ADV wipe -PAST
'He wiped the table very clean.'

b. kare -wa teeburu -o Hanako -ga yorokobu -hodo kirei -ni
he -TOP table -ACC Hanako -NOM be pleased -EXTENT clean -ADV
hui -ta.
wipe -PAST
'He wiped the table so clean that Hanako will be pleased.

(608) a. John -wa niku -o totemo yawaraka -ku ni -ta.
J. -TOP meat -ACC very soft -INFIN boil -PAST
'John boiled the meat very soft.'

b. John -wa niku -o sobo -mo tabe -rareru -hodo yawaraka
J. -TOP meat -ACC grandma -EVEN eat -possible -EXTENT soft
-ku ni -ta.
-INFIN boil -PAST
'John boiled the meat so soft that even grandma can eat it.'

R is also modifiable in Malayalam, (609). (609b) demonstrates that the modifier indeed forms a constituent with the head of R, and does not modify the entire complex predicate.

(609) a. avaḷ ari nann -aayi poḍiy -e kutt -um.
she rice good -ADVL become powder -NPP pound -FUT
'She will pound the rice quite powdery.' (K.A. Jayaseelan, p.c.)

b. nann -aayi poḍiy -e avaḷ ari kutt -um.
good -ADVL become powder she rice -NPP pound -FUT
'Quite powdery she will pound the rice.' (K.A. Jayaseelan, p.c.)

So far as I know, the implication in (605) has no exceptions.

Crucially, the converse seems to hold as well, (610).

(610) If R is a phrase, M follows R.

Or contrapositively, when R follows M, it is constrained to be a head. The clearest examples are from Japanese. In (611), R is the verb korosi 'kill,' which follows the means verb uti 'shoot.' Here R cannot be modified, (612).

(611) John -ga Mary -o uti korosi -ta.
J. -NOM M. -ACC shoot kill -PAST
'John shot Mary dead.' (ex. & tr. Washio 1997: 2)

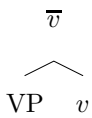
(612) * John -ga Mary -o uti totuzen/korituyoku korosi -ta.
J. -NOM M. -ACC shoot suddenly/efficiently kill -PAST
Intended: 'John suddenly/efficiently killed Mary by shooting her'

To my knowledge the same is true for Ijọ and Mizo: R cannot be modified, and R follows M. Below in section 4.4 I show that the Yiish languages do not upset this basic pattern, though they do require an interesting addition.

4.3.3 Explaining the order of verbs in OV languages

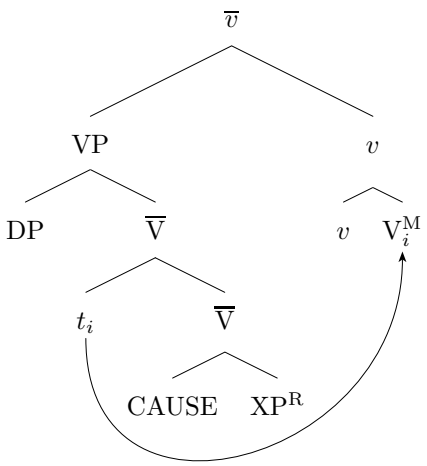
Let's assume that in the typical OV language, the linearization rules put v after VP, as implied by (613). This is standard.

(613)

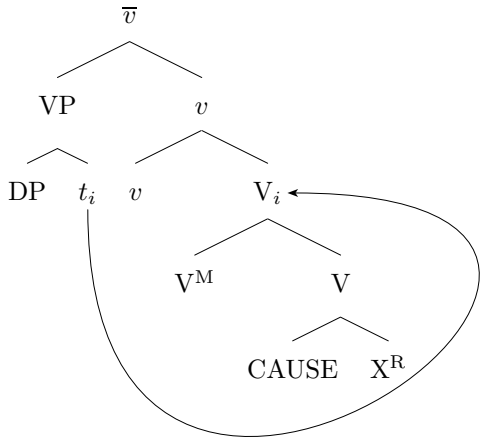


Then if raising to v is obligatory, CCs in OV languages will have one of two basic derivations. If R is a phrase, the means verb will raise individually, (614). If R is a head, the whole complex causative V_o will raise, (615). (In these trees, linear relations among the constituents of the minimal CC predicate are meant to be irrelevant; those between the daughters of $\overline{v}$, and between the daughters of VP, are intended.)

(614)



(615)



In each case, raising of any other V_o to v would be nonminimal, and raising of a phrase would be improper; see section 4.2.2. Leftward raising of the object DP to a higher specifier would be string-vacuous, and as usual, rightward extraposition could only yield a nonbasic order. In effect, then, (614) and (615) represent the only possible basic structures.

Now consider their linearization. When R is a phrase, (614), the means verb raises out of VP and adjoins to v. Since the contents of v are pronounced after those of VP, this derivation yields R-M order. Thus phrasal R implies basic R-M order, as desired. And this order results, notice, regardless of what we presume is the underlying order of M and R, i.e. the order they would be pronounced in if M remained in situ.

When R is a head, (615), raising to v leaves both M and R in place. Their relative order will therefore follow directly from the linearization of the complex head $[_{V_o} V^M[$ CAUSE $X^R]]$. So evidently, our linearization rule (616), which repeats (533), remains correct here, in the context of OV languages.

(616) A complex head [X [CAUSE Y]] is pronounced XY.

In light of the facts, it would be perverse not to accept (616). Whether in VO or OV languages, M-R order is always basic when R is a head. So (616) ought to be a consequence of universal principles, principles which have the same consequence independently of the VO/OV distinction.

I suggest that (616) reflects the compositional structure of the CC predicate. M and R are both arguments of CAUSE. I have postulated that CAUSE has R as its first argument and M as its second: [M [CAUSE R]]. R is thus the more embedded 'inner' argument, and M, the less embedded 'outer' argument. (616), I propose, expresses the linear translation of this structure. The outer argument precedes the combination of functor (here CAUSE) and its inner argument, (617), and consequently it precedes the inner argument itself.

(617) Given a structure $[_\beta$ X $[_\alpha$ F Y]] (order irrelevant), if $[\![\beta]\!] = [\![\text{F}]\!]([\![\text{Y}]\!])([\![\text{X}]\!])$, then X precedes α.

What differs between VO and OV languages is the relative order of heads and complement phrases. But an outer argument is not a complement of its sister; nor, in the case of CCs, is the outer argument of CAUSE a phrase. So there is no reason why (617) should yield different results VO and OV languages. Compare the order of specifiers and complements. By hypothesis, specifiers precede their sisters in both VO and OV languages; and as a result, specifiers precede complements, universally.[17]

[17]The analogy between outer arguments and specifiers, or inner arguments and complements, may be a theoretically principled one. But I am not suggesting that these notions be conflated. As

(617) seems a reasonable hypothesis about why (616) should be true. What is more important, however, is that it shows how *some* simple principle of linearization, if not (617) itself, could have (616) as a theorem, independently of VO/OV distinction.[18]

According to Carstens (2002), the fact that any OV language has M-R order is predicted to be "an anomaly," given standard ideas about phrase structure and its linearization. But this judgment depends on a premise I take to be false. Carstens presumes that R is always a phrase. As a result, the means verb always has a phrase in its sister, which Carstens regards as a complement in the X-Bar theoretic sense.[19] So given the standard idea that a verb follows a phrasal sister in an OV language, one would expect R-M order uniformly. But we have seen that, in fact, when R follows M in an OV language, R is never a phrase. It is always a head, which combines with CAUSE and the means verb to form a complex V_o. And in the domain of complex heads, generalizations about the ordering of heads and their phrasal sisters (or X-Bar complements) do not apply. So in fact, M-R order is not predicted to be anomalous, not when R is a head.

A theoretical conflict might arise when R is a phrase. If heads always follow sister phrases in the typical OV language, then when R is a phrase, the underlying order should have M following R. But if outer arguments always precede inner arguments, then the underlying order should be M after R across the board, whether R is a head

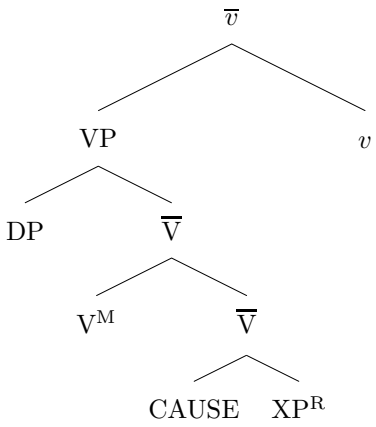
defined within X-Bar theory, specifiers and complements are both phrases, and daughters of phrasal projections. Outer and inner arguments needn't be either. For thoughts on the internal structure of complex heads, see Embick and Noyer 2001.

[18]In fact, there is no reason to think that the linearization of a complex causative V_o should vary with the VO/OV distinction, even if I am wrong and CAUSE combines first with *M*, as Wunderlich 1997 and Embick 2004 have it, and not with R. Even then, the two immediate parts of the head, namely [M CAUSE] and R, would not stand in a head-complement relation; R would be an outer argument, and in any case, not a phrase. So it would remain plausible to assume that (616) is valid universally. We should only have to derive its truth from some principle other than my (617).

[19]We should remind ourselves that the semantic relation between M and R, *CAUSE*, is never intrinsic to the general sense of either predicate's head. So any claim that, on purely semantic grounds, R must be a complement of M, or vice versa, is unfounded.

or a phrase. So for (618), the two principles predict different orders.

(618)



Yet this will lead to no difference in surface order if raising to v is mandatory; as noted above, raising the means verb yields R-M order either way. So a choice would be forced only if the assumption of obligatory raising were dropped. Then the means verb might remain in situ, and the underlying order might surface. In that case, since the attested order is R-M, we should have to conclude that the underlying order is determined by the principle that heads follow phrasal sisters in OV languages, rather than by (617). There are two ways to understand this consequence. Either the former principle supersedes the latter, or (617) does not apply except in the domain of complex heads, by stipulation. I won't choose one analysis or the other, since I assume that raising is obligatory.

So in sum, when R is a head, M-R order directly reflects the linearization of the complex head $[_{\text{V}_\text{o}}\text{V}^{\text{M}}[\ \textsc{cause}\ \text{X}^{\text{R}}\ ]]$. No other basic order is possible, because excorporation out of this V_o is impossible. When R is a phrase, R-M order is derived by raising of the means verb to v. And even if raising were not obligatory, the same R-M order could be assured by the general principle that, in OV languages, a head will follow a phrase in its sister.

4.4 The case of Yi

The Yiish (or Loloish) languages are all OV. Given the results of sections 4.2 and 4.3, we therefore have these expectations about word order in Yi CCs. (i) If R is phrasal, we expect it to precede M; see section 4.3.2. And (ii), regardless of R's size, we expect continuous order, with M and R adjacent, and the noun phrase that controls R preceding both predicates; see section 4.2.4. In this section we will see that neither expectation is satisfied. But the unexpected data are easily accommodated, without any basic change to the theory. I will concentrate on data from Nosu, the dominant dialect of Northern Yi.

I begin with prediction (i). According to (610), phrasal R implies R-M order. Nosu (622) appears to be a complex causative, and its presumed R predicate is phrasal. It includes a reduplication of the (adjectival) verb bo^{34} ʂo^{33} 'be clean', together with a required particle dʑi^{33} between the duplicates. This is the usual way to add the meaning 'very' in Nosu. In Mandarin, reduplicates pattern like phrases, and the same appears to be true in Yi. (The intervening morpheme sɪ 'SI' is described in a note.[20])

[20]In all the Yiish languages, when the supposed result predicate is phrasal, it cannot follow the supposed means predicate immediately. A functional morpheme, let's call it the *linker*, must occur between them (see e.g. Ding 1993: 341–342 and Li and Wang 1986: 120). In Nosu, the linker is typically sɪ (tone variable).

In general the linker is a functional morpheme that occurs, possibly among other places, in a broad range of contexts following a verb that is not the final verb in the clause. (619–621) show some other contexts where sɪ occurs in Nosu.

(619) nɯ^{33} do^{34} mu^{33} sɯ^{33} ʑu^{33} sɪ^{34} ŋa^{33} bi^{34} la^{33}.
2s dagger seize SI 1s give come
'Hand the dagger over to me!' (Li and Ma 1982: 83)

(620) ʑe^{21} ʑo^{55} a^{34} ɳɪ^{33} gɯ^{33} tshi^{33} pɪ^{55} sɪ^{21} la^{33} o^{34}.
potato many CLS 3s dig SI come PRT
'A lot of potatoes, he dug out.' (Li and Ma 1982: 83)

(621) tshi^{21} a^{34} ta^{33} ko^{33} lo^{33} mu^{55} dʑi^{33} mu^{55} sɪ^{21} ko^{33} tɕo^{34} na^{33}.
3sPOSS father an- -gry REDUP -gry SI 3smO DAT ask
'His father interrogated him very angrily.' (Li and Ma 1982: 83)

As such, the linkers belong of a broad class of morphemes called "nonfinal" markers in the Tibeto-Burmanist literature (e.g. Matisoff 1969, 1976; Wheatley 1984, 1985; Thurgood and La Polla 2003).

(622) tshi^{33} sɪ^{34} bo^{34} ʂo^{33} dʑi^{33} bo^{34} ʂo^{33} o^{34}
wash SI clean REDUP clean PRT
'wash [it] very clean' (Chen and Wu 1998: 47, tr. AW)

Yet despite being phrasal, R follows M. And so the sentence seems to violate (610).

This conflict can be resolved, I believe, by relating the possibility of structures like (622) to a typologically unusual feature of adverb placement in Yi. In these languages, certain types of VP adverbs follow the verb they modify. Thus ndʑɪ^{33} 'fast' follows po̲^{55} 'run' in (623) and ȵi̲^{55} ko^{33} 'too late' follows bo^{33} 'leave' in (624), both sentences of Nosu.

(623) tshi^{33} po̲^{55} ndʑɪ^{33}.
3s run fast
'He runs/ran fast.' (Chen and Wu 1998: 55)

(624) nɯ^{33} bo^{33} ȵi̲^{55} ko^{33} o^{34}.
2s leave late too PRT
'You left too late.' (Chen and Wu 1998: 55)

This is a very uncommon word order among OV languages.[21] Similar orders are not

Functionally, these nonfinal markers have close analogues in, e.g., Japanese -te (Iwasaki 2002), or the Turkic "converbial" suffix in -Vp (Johanson and Csató 1998). Often in Yiish and Burmish languages, a nonfinal morpheme (or at least an exact homophone) also occurs following adnominal modifiers as well, including possessives, when these precede the noun. This is the case with Hani ɤ^{33} (Li and Wang 1986: 99) and Achang sɿ^{21} (Dai and Cui 1986: 56), for example.

I assume that the nonfinal markers, like the Japanese infinitive -ku or the Malayalam participial -e discussed above, are semantically vacuous. They do not indicate the semantic relation assigned to the phrase they attach to. And consequently I will not spend any time on their analysis here.

[21]Matthew Dryer has compiled a survey of 207 OV languages, from 104 language genera (Dryer 2003). Of these just sixteen, from ten genera, put adverbs after the verb (p.c.). Two of these sixteen are Sino-Tibetan: Angami and (Tiddim) Chin, both Kuki-Chin languages. Angami and Chin are also among the even smaller subset of four languages which have PPs preceding the verb, but have adverbs of other sorts following. Three more Sino-Tibetan languages in Dryer's survey—Mizo, Mikir, and Lakher, all of them Kuki-Chin—put some adverbs after the verb and some before, with all PPs in the latter category. So the word order pattern in Nosu and other Yi languages is cross-linguistically quite infrequent (M. Dryer, p.c.).

Even within Tibeto-Burman it is uncommon. Randy La Polla (p.c.) has compiled data on 170 Tibeto-Burman languages. For 64 of these, his database includes information about the relative order of verbs and adverbs. Of these 64, only 8 put adverbs after the verb, and 4 more allow

possible in Japanese, German, or the Dravidian languages. And in all these languages, it is uncontroversial that phrasal R predicates precede M.

The category of 'OV languages' over which I have generalized is thus too coarse. OV languages share many word order properties, but not all. And our generalizations are preserved if we simply relativize them to the slightly finer classification that the Yi facts imply, (625).

(625) a. In typical OV languages, where adverbs precede the verb, if R is a phrase, it precedes M, and if R follows M, it is a head.

b. In an atypical OV language, where (some) VP adverbs follow the verb, it is possible that R follows M, even if it is a phrase.

(625b) is only a minor addition. It describes a special set of languages, disjoint from those previously considered, and thus leaves our earlier generalizations valid, (625a). More importantly, the correlation observed in (625b), between the position of secondary predicates of result and VP adverbs, is structurally a natural one. In Japanese, and in the Dravidian languages, manner adverbs and R predicates are often marked with the same suffixes. And in Mandarin, the same basic form, namely the V-*de* construction (see section 2.6 of chapter 2), can introduce either a predicate describing the manner of the V action, (626a), or one describing a result, (626b). (See Huang 1988 and Lamarre 2001 on similarities and differences between the two cases.)

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them there in some cases. Yet these 12 include mostly Karen languages, which are VO. So the OV languages with this pattern are very few. La Polla observes (p.c.) that the rare order is historically the newer one, one which may of course reflect contact with VO languages. Sinitic, Tai, Mon-Khmer and Hmong languages are all VO. It's worth noting that Burmese itself does not have postverbal adverbs (see Okell 1969: 134–139, Wheatley 1982).

(626) a. tā hǎn -dé hěn xiǎngliàng.
3s scream -VDE very loud
'S/he screamed very loud.'

b. tā hǎn -dé wǒmén dōu lùoxià -le yǎnlèi.
3s scream -VDE we all fall -PFV tear
'S/he screamed such that we all shed tears.' (L. Li 1963: 405, tr. AW)

c. * tā hǎn -dé wǒmén dōu lùoxià -le yǎnlèi (-dé) hěn xiǎngliàng.
3s scream -VDE we all fall -PFV tear (-VDE) very loud
Intended: 'S/he screamed such that we all shed tears, and very loud.'

Manner and result predicates following -dé 'VDE' in Mandarin are moreover in complementary distribution, (626c); there is just one open slot after the verb. And the same appears to be true of the postverbal predicates in Yi (Chen and Wu 1998: 34–35).[22] So it is plausible to assume that phrasal R predicates and postverbal adverbs in Yi occupy the same basic syntactic position,[23] regardless of their different semantic relations to the verb. Correspondingly it is plausible that their linear position in accounted for in the same way, by the same syntactic principles, as (625b) suggests. What those principles are is a question that needn't be answered here, where my goals are more modest; but I allow myself a brief comment at the end of this section.

Let's now turn to our second prediction. As discussed in section 4.2.4, OV languages have continuous order in CCs. The (overt) noun phrase that controls R (i.e. the direct object) precedes both M and R, which are consequently adjacent. And we saw

[22] In some Yi languages, there is evidence that speakers perceive an analogy between their postverbal secondary predicates and the Mandarin V-*de* construction. In place of the usual linker sɪ, the dialect of Northern Yi described in Ding 1993 has dɯ^{33}, a form phonetically similar to Mandarin dé 'VDE,' pronounced [dʌ]. The use of dɯ^{33} as a linker is not mentioned in Fu 1997/1950, Li and Ma 1982, Chen et al. 1995, or Chen and Wu 1998. This suggests borrowing in Ding's Yi, whose speakers are nearly all bilingual in Mandarin.

[23] Compare the comments in Larson 1988 on generating certain types of adverb as the innermost complement of the verb.

that this is easily explained, if that noun phrase is always generated outside the complex predicate. In light of these conclusions, sentences like Nosu (627) are surprising.

(627) tshi^{33} ndu^{21} sɪ^{21} si^{33} du̲^{33} o^{34}.
3s beat SI blood come out PRT
'He beat [him] till blood came out.' (Li and Ma 1982: 83, tr. AW)[24]

We can interpret this sentence as describing an event of causation: the beating causes blood to flow. But the noun phrase that identifies the patient of the putative result event, si^{33} 'blood,' occurs between ndu^{21} 'beat' and du̲^{33} 'come out,' yielding what looks like discontinuous order. So if indeed these two verbs form a complex predicate, and the intervening noun phrase has its base position outside that predicate, (627) presents a counterexample to the generalization established in section 4.2.

I propose in response that si^{33} 'blood' is not generated above both verbs, but rather forms a constituent with the verb it controls, du̲^{33} 'come out,' as in (629).

(629) [$_{XP}$ si^{33} du̲^{33}] 'blood comes out'

The same goes for the second clause in (630), the clause that follows the conjunction sɪ^{33} nɪ^{21} 'and.' Here the noun phrase lo̲^{55} bu^{33} 'palms' forms a constituent with a^{33} n̥ɪ^{33} 'red,' (631).

(630) ŋa^{33} vɪ̲^{55} ga^{33} tshi^{34} tshi^{33} sɪ^{33} nɪ^{21} tshi^{33} sɪ^{34} lo̲^{55} bu^{33} a^{33} n̥ɪ^{33} o^{34}.
1s clothes wash wash and wash SI palms red PRT
'I washed and washed the clothes, and washed till my palms were red.'
(Chen and Wu 1998: 88, tr. AW)

[24](628) is the Mandarin translation of the Nosu (627) given in the source text (Li and Ma 1982: 83).

(628) bèi tā dǎ chū xuě lái -le.
PASSIVE 3s beat come out blood come -LE
'Beaten by him such that blood came out.'

The translation uses a passive. But the original Nosu sentence has the active form of 'beat,' ndu^{21}, with a falling tone, and not the passive, ndu^{34}, with a rising tone. Thus I assume that the translators use the passive only to indicate that the noun phrase preceding the verb, namely tshi^{33} '3s,' identifies the agent of beating, and not its patient.

(631) [$_{XP}$ lo̲^{55} bu^{33} a^{33} n̥i^{33}] 'palms are red'

The evidence for this is simple. In my source materials, I have found no examples where a noun phrase that intervenes between the putative means and result verbs is 'shared' by the verbs that flank it. (627) and (630) are representative cases. In the former, si^{33} 'blood' identifies the patient of du̲^{33} 'come out,' but it bears no thematic relation to the verb that precedes it, ndu^{21} 'beat.' In the latter, lo̲^{55} bu^{33} 'palms' identifies the patient of a^{33} n̥i^{33} 'red,' but bears no thematic relation to tshi^{33} 'wash.' If the intervening noun phrases were to c-command both verbs, this could only be an accident, since argument sharing would be possible in principle. But it is explained directly if noun phrases with this surface position form a constituent with the verb that follows (see chapter 1, sections 1.5 and 1.6).

Given this, the discontinuous word order is no surprise. Even if the understood result XP is generated within the sister of the preceding verb,[25] (633), it will occur after the main verb; this is what we saw above.

[25]Whether it is correct to put the result XP in the sister of the verb is not absolutely clear. This structure seems to be presumed by Chinese scholars of Yi. They consistently refer to the result phrase as a "complement" (*bǔyǔ*), and compare the construction to the Mandarin V-*de* construction, in which a verb is sister to a clausal secondary predicate. But with the data I have, I cannot rule out the reasonable alternative that sentences like (627) and (630) comprise a sequence of clauses, joined paratactically under one sentence-final aspect marker (here, o^{34}).

More generally, it may not be right to include Yi sentences like (627) and (630) in the class of complex causatives. If the result XP is itself a full clause, then these sentences are not CCs under any common definition, no more than the English sentences in (632).

(632) a. With Al pounding the cutlet, it got flat.

b. Al pounded the cutlet, and it got flat.

I have speculated that (the head of) R never forms a constituent with the overt noun phrase that controls it. And if this is right, then sentences like (627) and (630) cannot be complex causatives.

One imaginable analysis of sentences like (627) and (630) can be eliminated definitively. They clearly do not involve coordination or serialization of VPs under a shared subject. If they did, they would mean 'He beat [him], making blood come out' and 'I washed [the clothes], reddening my palms,' respectively. But the verbs du̲^{33} 'come out,' a^{33} n̥i^{33} 'red' are manifestly intransitive and nonactive. The Yiish languages mark a contrast between nonactive (or 'automotive' [*zìdòng*]) and active (or 'causative' [*shǐdòng*]) voice in the quality of the onset consonant; see Chen and Wu 1998: 117ff, Sun 1999.That du̲^{33} 'come out' is a nonactive intransitive is clear from its voiced onset. If it meant 'to make come,' it would most likely be pronounced tu̲^{33}; compare dzu̲^{33} 'to stand erect'

(633) a. [ndu^{21} 'beat' ... [$_{XP}$ si^{33} du̲^{33} 'blood comes out']]

b. [tshi^{33} 'wash' ... [$_{XP}$ lo̲^{55} bu^{33} a^{33} n̥ɪ^{33} 'palms are red']]

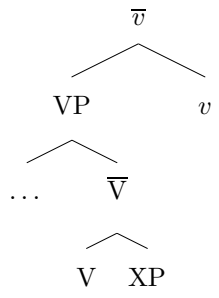
And with the result phrase in this final position, a noun phrase within it will of course intercede between the two verbs.

So a sentence like (627) does not upset our basic generalizations; they just need a marginal addition. In a typical OV language, a verb will follow a phrase in its sister. As demonstrated in section 2.4, this has the consequence that the basic word order of CCs is continuous in all typical OV languages. But in certain atypical OV languages, like those in the Yi group, a verb may precede a phrasal secondary predicate or adverb in its sister. And so here discontinuous order is possible, if the secondary predicate following the main verb includes its own overt noun phrase.

The outstanding question, then, is what syntactic derivation can be assigned to Yiish sentences where an adverb or secondary predicate follows its verb. I cannot answer this persuasively, given my present resources on Yi. But two general observations are in order.

A simple derivation would be available, if we were to suspend the assumption that raising to v is mandatory. Then it would be enough to assume that, for certain choices of XP—namely, when XP is an inner adverb or secondary predicate—a $\overline{\text{V}}$ constituent [$_{\overline{\text{V}}}$ V XP] is linearized with XP following V, (634).

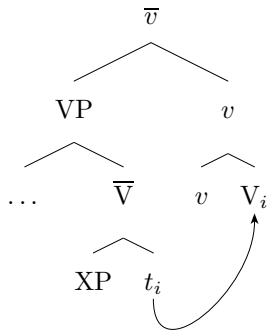
(634)



and tʂu̲^{33} 'to make stand erect.' As for a^{33} n̥ɪ^{33} 'red,' predicates with the characteristic a- prefix of adjectival verbs can never be used as active transitives.

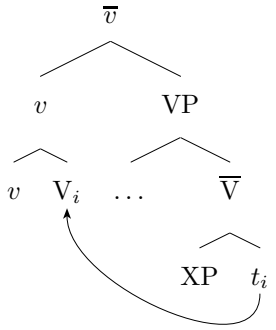
But if, as I would prefer, obligatory raising to v is sustained, (635), a more complex derivation will be necessary.

(635)



Under standard assumptions, a phrase within VP could follow a verb in v only if VP itself follows v. So it would be necessary to posit a linearization rule for Yi which puts VP after v, as implied by (636).

(636)



Yet such a rule could not (plausibly) be made contingent on whether VP happens to contain a certain sort of adverb or secondary predicate. It would have to apply in general, making Yi an unusual OV language where v uniformly precedes VP, contra (613) (cp. Wheatley 1985). And if this were true, it would be necessary that, in any given sentence of Yi, every subconstituent of VP raises 'leftwards' to a position above $\overline{v}$, *except* for the relevant adverbs and secondary predicates, since only these surface to the right of the verb. And this is an audacious hypothesis that I cannot defend here (cf. Carstens 2002).

4.5 Conclusion

To many analysts it has seemed significant that R is a head in Mandarin and Igbo, but a phrase in English. In chapter 2 we saw that this is not what determines whether or not verbs in M project uniformly. Here only the size of M could be relevant. If a language lacks the UPP, M must contain just the means verb, and never an argument NP. Otherwise a verb in M would occupy the same local context as it does in a simple clause, and would thus would enter the same dependencies in both conditions.

But the size of R does matter to surface word order. In VO languages, the basic word order is M-R-OBJECT when R is a head and M-OBJECT-R when R is a phrase. In OV languages, the basic order is OBJECT-M-R when R is a head and, in general, OBJECT-R-M when R is a phrase.

The pattern in VO languages follows neatly from a syntactic premise that is also central to my account of argument structure in CCs. M contains just the means verb alone, and the direct object is generated outside the minimal constituent that contains both M and R. With the object outside the complex predicate, M-OBJECT-R order can be derived only by raising of the means verb individually. But such raising is possible only when R is phrasal. For when R is a head, it combines with M to make a complex V_o, and an X_o category is an island for movement.

The pattern in OV languages also has an equally simple account. When M and R are both heads, their order expresses the linearization of the complex head $[_{V_o} V^M [$ CAUSE $X^R]]$, which, again, cannot be split by excorporating movement. When R is a phrase, the means verb raises to v, and consequently surfaces to the right of the VP, where R remains in situ.

Thus the account of M-R versus R-M order in OV languages is essentially the same as that of continuous versus discontinous order in VO languges, respectively.

Chapter 5

Final remarks

5.1 Complex causatives and verbal valence

The projectionist model of argument structure has come under widening scrutiny. In response to the diverse influences of Marantz 1984, Kratzer 1996, Goldberg 1995 and others, it has become common to claim that at least some arguments are introduced by verb phrase structure, and not by the verb itself. Yet it remains difficult to distinguish projectionist and nonprojectionist analyses empirically, in most cases. In the preceding chapters, I have showed that complex causatives, analyzed as complex predicates, provide an exceptionally sharp diagnostic for claims about verbal valence.

In Igbo and Mandarin, CCs indicate clearly that the typical verb has no arguments lexically. In general, a verb in these languages is not subject to the same requirements in a complex causative as it is in a simple clause. If it must occur with a noun phrase identifying the agent or patient of its event in a simple clause, it need not therefore do so when in M. Yet the verb has the same form and the same basic sense in both contexts. There is no change in either syntactic or semantic category, to which the contrast could be linked. Nor is it a general property of complex causatives

that the argument structure of the means verb is modified or suppressed. In many languages, including English, verbs systematically enter the same array of argument relations in both complex causatives and simple clauses. We must therefore conclude that, characteristically, verbs in Igbo and Mandarin do not lexicalize the argument structure they enter in simple clauses. Arguments are instead introduced by the structural context. Since CCs are complex predicates, a verb in M is not in the same local context it occupies in simple clauses: it is embedded with respect to the structures that introduce agents and patients. Thus no thematic relations are assigned to M individually, and the facts follow, as we have seen.

This account capitalizes on the observation that a verb's valence is not a trivial consequence of its meaning. A verb whose event involves a certain participant need not have that participant as a lexical argument. Correspondingly, verbs which describe similar sorts of events need not have the same lexical argument structures, even within a single language. English already hints at this, but Mandarin and Igbo amplify the point. I make the further claim that languages show *characteristic* differences in where arguments are introduced. Agents and patients are associated with individual verb roots in some languages (English), but with maximal VP predicates others (Igbo, Mandarin). As it stands, this is an underived postulate; I see no explanation for why a language should be of one type or the other. But assuming differences along this dimension affords great simplifications elsewhere in the grammar, in areas where we should not want to posit complexity or cross-linguistic variation. There is no need to say, as there otherwise would be (cf. Y. Li 1995), that Igbo and Mandarin CCs involve special operations on argument structure, operations that are motivated neither cross-linguistically nor within the language. In fact it becomes possible to say that they have the same basic structure everywhere. CCs are complex predicates in a clause whose direct object identifies the patient of causation, thus controlling R;

transitives add an underlying subject that identifies the agent of causation. Further details of semantic structure stem only from the varying lexical contributions of the means and result predicates. And differences in word order derive primarily from the size of R, head or phrase.

I find these results attractive. And consequently I endorse the premises that allow them, such as the assumption that natural language includes both AG and PAT in its stock of basic predicates. But of course this is only a beginning. I have been selective, discussing only data that answer the theoretical question I have pursued in this work. Dozens of other topics in the verbal grammar of Igbo and Mandarin still demand attention. The many insights of past discussions, carried out mostly under projectionist premises, need to be reinterpreted through the prism of the NAT. Surely in some cases the new perspective will create new challenges. But more often it will solve old problems, I believe. These languages are better understood within a nonprojectionist framework.

There is one area of data I have not mentioned which challenges the descriptive viability of the NAT most directly. That is the *potential form* of the complex causative in Mandarin. I close with a description of the problem, and a quick sketch of the required response. A more thorough account is forthcoming in future work.

5.2 The Mandarin potential form

Mandarin CCs may occur in either of two *potential forms*, the positive and the negative. The positive form has dé between M and R, (637). The negative has bu in the same position, (638); bu is the general marker of negation for nonperfective predicates. In this context I will gloss dé and bu as PPOT and NPOT, respectively.

(637) Positive potential form: SUBJECT V^M dé V^R OBJECT

(638) Negative potential form: SUBJECT V^M bu V^R OBJECT

As in the normal form of the CC, the potential form does not allow R to be phrasal, (639). This, and the basic position of the object following the second verb, are among the features that distinguish the positive potential form from the V-*de* construction discussed in chapter 2.

(639) * xǐ dé/bu fēicháng gānjing nàtiáo kùzi
wash PPOT/NPOT extremely clean that pants

The meaning of the potential form is modal. The positive form says that the M event *can* bring about the R result, and the negative form says it *cannot* (Li and Thompson 1981: 56–7). So (640) says that Lao Wei's kicking the plank can make the plank snap, and (641) says that it cannot. More idiomatic translations are given with the examples.

(640) Lǎo Wèi tī dé duàn nàtiáo mùbǎn.
L.W. kick PPOT snap that plank
'Lao Wei can make that plank snap by kicking.'

(641) Lǎo Wèi tī bu duàn nàtiáo mùbǎn
L.W. kick NPOT snap that plank
'Lao Wei cannot make that plank snap by kicking.'

Necessarily, the modality is objective or physical. (640) and (641) are about what is possible in light of Lao Wei's physical ability, the constitution of the plank, and the laws of nature. The modality cannot be epistemic, deontic, or buletic, for example (Light 1977, Liu 1980). In excluding these modalities, the potential forms contrast with the modal verbs, such as néng 'can' (*pace* Gu 1992, Wu 2002). (642) might be a statement about what is physically possible, but it might also be about what is permitted by some relevant set of ethical rules or practical goals.

(642) tā dāngrán (bu) néng tī duàn nàtiáo mùbǎn.
3s of course (NEG) can kick snap that plank
'Of course he can(not) make that plank snap by kicking.'

The potential forms also seem to carry two presuppositions (or perhaps, conventional implicatures). First, they imply that it would count as a nontrivial achievement for M to cause R, with the agent and patient given. And second, they presuppose that the M event is itself physically possible. If Lao Wei were known to be congenitally legless, then even the negative form, (641), would be a bizarre thing to say (see Li and Thompson 1981: 57). (642), much less so. Thus (640) and (641) might be paraphrased more fully as (646) and (647), respectively, capturing both their assertions and their presuppositions.[1]

(646) 'It is physically possible that, in a situation where Lao Wei kicks the plank, his kicking manages to make the plank split.'

(647) 'It is not physically possible that, in a situation where Lao Wei kicks the plank, his kicking manages to make the plank split.'

[1]Like English constructions with able to (see e.g. Thalberg 1972, Bhatt 1999 and Piñon 2003), the Mandarin potential forms may sometimes be construed episodically, rather than modally. The positive potential form is taken to describe an actual event of M successfully causing R, and the negative form, an event where M happens, but does not cause R. In other words, each is taken to describe a verifying instance of the modal proposition that is its basic meaning.

It seems unlikely that this is a true ambiguity. For positive potentials, the episodic reading is at best marginal. And for yes/no questions based on the potential form, it is sharply unavailable; (643) can only be a question about what is possible, not about what has actually happened.

(643) zuì dà -de mùbǎn, tā tī dé duàn, tī bu duàn?
most big -NMOD plank 3s kick PPOT snap kick NPOT snap
'Can s/he make the biggest plank snap by kicking?'
Impossible interpretation: 'Did s/he manage to make the biggest plank snap by kicking?'

Only for the negative forms is the episodic interpretation clear. So like English (644), Mandarin (641) can be used to convey the message in (645).

(644) Lao Wei was not able split that plank by kicking it.

(645) 'Lao Wei did not manage to make that plank split by kicking it.'

Why the episodic reading is restricted in this way, and how exactly it is related to the basic, modal meaning, are both open questions.

The literature is largely silent on how to model the semantics of the potential form formally. And even descriptively, much remains unclear. But one thing is clear, and directly relevant to the NAT. All thematic relations fall within the scope of modality. Thus (640) has a plausible paraphrase in (648); but anything like (649) is of course absurd.

(648) 'It is physically possible that: there is an event of kicking causing splitting, with Lao Wei the agent and that plank the patient.'

(649) # 'Wei is the agent, and that plank is the patient, of it being physically possible that: there is an event of kicking causing splitting.'

Let's say that the meaning of the potential form involves a modal predicate $\mathcal{P}$. Above, I have glossed $\mathcal{P}$ as 'it is physically possible that ...,' but other analyses for $\mathcal{P}$ are conceivable (see below). And for concreteness, let's say that $\mathcal{P}$ is introduced by a morpheme π.

The NAT says that thematic relations are introduced outside the smallest constituent containing both M and R: a patient relation is introduced at VP, and an agent relation with the v_{AG} head. So given (648), the NAT requires that π occur above or adjoined to v_{AG}, (650).

(650) $[\ \pi \ldots v_{\mathrm{AG}}\ [_{\mathrm{VP}}\ \mathrm{Obj}\ [_{\mathrm{V}}\ \mathrm{V_M} \ldots \mathrm{V_R}\ ]]$

There is some independent support for this, faint but persuasive. Numerical indefinite noun phrases in the subject of a potential form CC can be interpreted within the scope of the modal, (651).

(651) sānge rén jiù tūi dé dǎo nàliàng chē.
three people then push PPOT invert that car
'(A group of) three people could make that car topple by pushing.'

(651) does not say that there exists a group of three people who can topple the car by pushing. It says that any group of three could do this. Correspondingly, subsequent anaphoric reference to a particular group of three people is impossible: (651) cannot sensibly be followed by (652).

(652) # . . . yīnwèi tāmén sān tiāntiān chī rénshēn.
because 3p three daily eat ginseng
'. . . because those three guys eat ginseng every day.'

This suggests that the subject, sānge rén 'three people,' is interpreted within the scope of modality.[2] And under standard assumptions (see e.g. Iatridou and von Finkel 2003: 185–194) this requires that the subject DP be generated within the c-command domain of π, the morpheme that introduces the modal predicate $\mathcal{P}$.

This consequence of the NAT must be reconciled with the analysis of dé and bu, the markers of the potential form. The NAT would become a problem, if one were to accept two further premises:

(i) dé 'PPOT' pronounces π, and correspondingly, bu 'NPOT' signals the negation of a proposition containing $\mathcal{P}$;

(ii) the surface position of dé 'PPOT' and bu 'NPOT' reflects their base position directly.

The two potential markers surface between M and R. If this reflects their base postion, as (ii) says, they must be generated within the minimal CC predicate, (653).

(653) $[_{\mathrm{V}}\ \mathrm{V_M}$ bu/dé . . . $\mathrm{V_R}\ ]$

[2] In the general case, Mandarin does not allow numerical indefinites in subject positions; but modal contexts are among the particular cases where such subjects are natural (see Lee 1986, Huang 1987, F. Liu 1996, A. Li 1998, and Tsai 2001).

So if de 'PPOT' pronounces π, as (i) says, then π is itself inside the complex causative verb. But this contradicts (650). And consequently, if the NAT is to be sustained without modification, either (i) or (ii) must be rejected. Here I will quickly sketch the consequences of each choice, leaving deeper elaboration for future work.

According to (i), dé 'PPOT' pronounces π, and bu 'NPOT' negates a constituent that includes π, which we can assume has a null allomorph in the negative context. So given (650), accepting (i) means that potential forms have a structure like (654), with dé 'PPOT' and bu 'NPOT' outside the complex predicate.

(654) $[\ \textsf{bu/dé}\ldots v_{\mathrm{AG}}\ [_{\mathrm{VP}}\ \mathrm{Obj}\ [_{\mathrm{V}}\ \mathrm{V_M}\ldots\mathrm{V_R}\ ]]$

Given this, we can assume a very simple semantics. We might just let π mean 'it is physically possible that ...,' for example, and thus assign the potential forms the meanings in (655), an adequate analysis.[3]

(655) a. 'It is physically possible that: Lao Wei makes the plank split by kicking.'

b. 'It is not physically possible that: Lao Wei makes the plank split by kicking.'

But the syntax requires some complication. If dé and bu are generated above the M and R verbs, their surface positions must be derived by a transformation, either in the syntax or the morphology. The assumptions I have made in this work constrain what sort of transformation this can be. It cannot be raising of the means verb individually to dé or bu, since such raising would violate locality conditions on head movement; the complex head $[_{\mathrm{V_o}}\mathrm{V^M}\ \textsc{cause}\ \mathrm{V^R}\ ]$ is an island. Nor can it be an operation of suffixation. Suffixes generated outside the VP, like the perfective -le, surface after the sequence of both verbs, not between them. Thus the required

[3]It is quite unclear, however, how to model the *presuppositions* of the potential form compositionally, given (654). But I will not discuss this here.

transformation could only be an operation of *infixation*. We must assume that, in their role as markers of the potential form, dé and bu are classified as *infixes*. Either by affix-lowering or verb-raising, they associate with the complex causative V_o. And being infixes, they surface between its morphosyntactic constituents, V^M and V^R.

To regard dé 'PPOT' as an infix is fairly plausible; but the idea is unnatural in the case of bu 'NPOT.' Bu is a general marker of negation. And except in the potential form, it does not occur between the morphosyntactic parts of what it negates. For instance, if it negates a verb phrase containing a modal and its complement, it does not occur between them, (656).[4]

(656) a. wǒ bu huì jiǎng shànghǎi huà.
1s NEG able speak Shanghai speech
'I can't speak Shanghainese.'

b. * wǒ huì bu jiǎng shànghǎi huà.
1s able NEG speak Shanghai speech
Intended: 'I can't speak Shanghainese.'

The need to consider bu 'NPOT' an infix is therefore a blemish on this first theory of the potential form.

The alternative is to accept (ii) and reject (i). By accepting (ii), we make the syntax simple. Dé 'PPOT' and bu 'NPOT' can then generated just where they seem to be, as in (657), which repeats (653). Specifically, they might be generated as sisters of the CAUSE head.

(657) $[_V\ V_M$ bu/dé $\ldots V_R\ ]$

But rejecting (i) means that dé 'PPOT' is not a signal of the modal predicate $\mathcal{P}$, and that bu does not mark the negation of a proposition containing $\mathcal{P}$. Instead, whatever

[4]Huang (1988: 284) even posits that bu "forms an immediate construction with the first V_o element following it."

meaning these morphemes contribute must be within the scope of $\mathcal{P}$, (658).

(658) Meaning of the potential form, given (650) and (657):
$\mathcal{P} + [\![\ [_{v\mathrm{P}} \ldots [_{\mathrm{V}}\ \mathrm{V_M}$ bu/dé $\mathrm{V_R}\ ] \ldots]\ ]\!]$

And this will require a less obvious semantic theory for the potential form. I will outline one idea of what that theory might be, broadly and informally.

The normal form of a CC says that the means event causes the result event. Suppose that dé 'PPOT' adds only presuppositional content, including at least the presupposition that the means event has occurred, prior to reference time, (659a). And suppose that bu 'NPOT,' in the negative potential form, simply negates this meaning, (659b).

(659) a. $[\![\ [_{v\mathrm{P}} \ldots [_{\mathrm{V}}\ \mathrm{V_M}$ dé $\mathrm{V_R}\ ] \ldots]\ ]\!] =$
e_m causes e_r ... (presupposition: e_m happened)

b. $[\![\ [_{v\mathrm{P}} \ldots [_{\mathrm{V}}\ \mathrm{V_M}$ bu $\mathrm{V_R}\ ] \ldots]\ ]\!] =$
e_m does not cause e_r ... (presupposition: e_m happened)

Then the vPs in our basic examples have meanings like in (660).[5]

(660) a. Lao Wei makes the plank snap by kicking
(presupposition: he kicked it)

b. Lao Wei does not make the plank snap by kicking
(presupposition: he kicked it)

These meanings are then to be embedded under $\mathcal{P}$. Clearly $\mathcal{P}$ cannot be a simple possibility operator, meaning 'it is physically possible that ...,' (661).

[5]The English glosses here abstract away from the understood location of the reference time relative to speech time. The potential form is in complementary distribution with any marking of (tense or) aspect. Thus any understood time reference is derived pragmatically.

(661) Wrong hypothesis about the meaning of the potential form:

a. It is physically possible that:

e_m causes e_r ... (presupposition: e_m happened)

b. It is physically possible that:

e_m does not cause e_r ... (presupposition: e_m happened)

For the positive form, this yields a fair paraphrase, (661a). But for the negative form, it yields truth conditions that are far too weak. (661b) says only that, maybe, M doesn't cause R. We need to say more than this. If (641) is true, Lao Wei's kicking *never* causes the plank to snap, not in any physically normal situation.

To this end, it seems better to interpret π as a species of generic operator, with $\mathcal{P}$ imposing universal quantification over what we might vaguely call 'physically representative cases,' (662).

(662) Meaning of the potential form, as a generic:

a. In any physically representative case:

e_m causes e_r ... (presupposition: e_m happened)

b. In any physically representative case:

e_m does not cause e_r ... (presupposition: e_m happened)

Our examples are then analyzed as in (663); here I accommodate the presupposition into the restriction of the universal quantifier.

(663) a. In any physically representative case where he kicks it:
Lao Wei makes the plank snap by kicking.

b. In any physically representative case where he kicks it:
Lao Wei does not make the plank snap by kicking.

This seems a fair analysis. But it will require the notion of 'physically representative case' to be made precise, and this is a difficult (indeed, classical) issue in epistemology and modal logic which I cannot enter here (see Thalberg 1972, Lewis 1973, Krifka et al. 1995). One necessary refinement of (662) ought to be pointed out, however.

When we say that Lao Wei can make the plank snap by kicking, we don't say that he will succeed immediately. It might take a few tries. And insofar as the failed attempts would not surprise us, it seems wrong to say that they are not representative cases. They may be only *less* representative than the case where Wei succeeds. So we need to impose an ordering on cases, from minimally to maximally representative (cp. Kratzer 1981). The minimal cases are the flukes and the supernatural anomalies. In the maximal cases, everyone performs at the best of their abilities, inert objects are in their normal condition, and the laws of nature are stable (whatever all this means, exactly). The semantic schemes in (662) should then be modified to quantify over *maximally* representative cases only. Correspondingly, we need to add this axiom: if $\neg\phi$ in a maximal case, then $\neg\phi$ in all less representative cases, unless they are minimal. So if Lao Wei cannot make the plank snap in the maximally representative case, he cannot do so at all, except in a situation that counts as a fluke.

Given this adjustment, (662) seems a reasonable hypothesis about the semantics of the potential. And to the extent that it is, it allows us to sustain the NAT without modification, while still assuming a simple syntax for the potential form, with dé 'PPOT' and bu 'NPOT' generated just where they seem to be.

Finally I note that, if the NAT is correct, the lack of uniform projection in Mandarin should be indicated in potential forms as well. That is, there should be potential form CCs where the verb in M does not enter the thematic dependencies that obtain in simple clauses. One expects that such locutions will often be odd for pragmatic reasons. But Lü Shuxiang quotes this example from novelist Jiang Zilong:

(664) chī jǐ dùn miàntiáo yě chī bu qióng tā.
eat several meal noodle also eat NPOT poor 3s
'Eating a few meals of noodles couldn't make him poor from eating.'
(Lü 1986: 7, quoting from Jiang Zilong's *Weichi Hui Chang*)

Here the means verb is chī 'eat.' The direct object identifies the understood eater, the subject refers to a situation with no thematic relation to the eating event, and no argument in the main clause identifies what is eaten. In simple clauses with chī 'eat,' this is impossible, (665).

(665) * chī jǐ dùn miàntiáo huì chī tā.
eat several meal noodle will eat 3s
Intended: 'There will be an event of eating, with him the agent, somehow related to eating a few meals of noodles.'

Further examples can be constructed along the same lines as (664), like (666).

(666) sān píng Lìbō píjiǔ yě hē bu zuì wǒ.
three bottle Reeb beer also drink NPOT drunk 1s
'Three bottles of Reeb beer can't make me drunk from drinking.'

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