

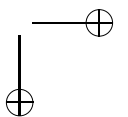
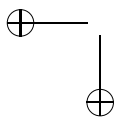
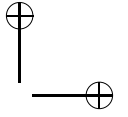
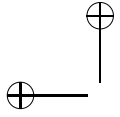
The Monotonicity Hypothesis¹

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Contents

- 0.1 Introduction v
- 0.2 What compositionality means for the semantics of word formation vii
- 0.3 Property concepts versus result states xv
- 0.4 Deverbal adjectives with property concept meanings: Derived statives xx
- 0.5 Discussion and concluding remarks xxvi

0.1 Introduction

It seems to be relatively widely acknowledged, especially in recent years, that while structural aspects of word-formation operations have been well-explored, the semantic side has received much less attention (Scalise 1986:40; Carstairs-McCarthy 1992:47ff.; Levin and Rappaport Hovav 1998; Lieber 1980, 2004). While there is work drawing on theories of lexical semantics to describe the semantic impact of word formation operations (Carter 1976, 1978; Dowty 1978, 1979; Jackendoff 1975, 1990; Pinker 1989; Levin and Rappaport Hovav 1998; Barker 1998; Lieber 1998, 2004; Booij and Lieber 2004; Plag 2004), the discussion has not yet generally moved beyond questions of how best to describe the facts of particular phenomena.² To the extent that the broader nature of the semantic side of word formation operations is discussed, exceptions to semantic compositionality tend to take front stage, one of the principle ideas being that many word formation operations do not allow for the generation of the meaning of the output of the rule on the basis of the meanings of its parts, so that the semantic outcome of many such word formation operations must be lexically listed. At the same time, however, there seems to be a persistent belief expressed in both the morphological and semantic literature that to the extent that a word formation operation is productive, it will also be semantically compositional (Zimmer 1964:32; Aronoff 1976:38ff.; Dowty 1979:302; Hoeksema 1985:Chapters 1,2; Kornai 1988; Badecker 2001; Bauer 2001:147). On the basis of this, in the studies that treat word formation from a formal perspective, it is often assumed that the principle of compositionality constrains productive word formation operations in the same way that it constrains semantic composition at the sentential level (Hoeksema, 1985; Kornai, 1988). There are, however, a number of phenomena, not treated in such discussions, from the argument

² Generally, I think that the literature in this area has focused much more on what Chomsky (1964, Chapter 2) called descriptive, rather than explanatory adequacy. In fact, Jackendoff (1990, 3) is unapologetic about this, noting, rightly I believe, that the latter can only be an area of focus once a theory meeting the former criterion has been developed. The same kind of observation is made, in essence, by Levin and Rappaport Hovav (1998).

structure literature that have been argued to require analyses that are non-compositional, specifically in drawing on word formation rules that effect deletion operations on lexical meaning. For example, the received wisdom on anticausativization is that it is a phenomenon whereby a CAUSE operator is deleted in the derivation of an inchoative verb from its causative counterpart (Grimshaw, 1982; Reinhart, 2002; Härtl, 2003; Reinhart and Siloni, 2005; Kallulli, 2006). Similarly, derived statives, deverbal adjectives that apparently do not entail the existence of a previous event (of the kind named by their verbal source), are treated by Dubinsky and Simango (1996) as implicating a deletion operation that strips away the change portion of the meaning of a change of state verb, leaving its stative core as the meaning of the deverbal adjective. Rothstein (2004, 114, 130) as well analyzes indefinite object drop and related phenomena as deletion of all meaning components in an accomplishment verb, save the activity sub-component. So, despite the fact that the assumption in much of the literature is that word formation operations are compositional, and as one consequence, do not remove decompositional operators, the practice in much of the literature, even prominent corners of it, does not match this assumption, raising the question whether such operations really are part of the semantic component of word formation or not.

The goal of this paper is to bring a broader perspective to the study of the semantics of word formation by considering in one particular semantic domain, the domain of states and changes of state, what kinds of empirical behavior are predicted if there do exist deletion operations of the kind proposed in discussions cited above. The kinds of data I am concerned with are data like those in (1).

- (1) a. *red* ‘the state of redness’
 b. *redd-en* ‘a change into the state of redness’
 c. *redd-en-ed* ‘a state of redness brought about by a change into the state of redness’

As discussed further below, the three words in (1) have meanings each of which is built upon the other. So while *red* names a simple state, *redden* names a change into that state, and *reddened* names a state brought about by a change of state (COS) event named by the verb *redden*. Additionally, as can be seen overtly in their morphology, the direction of derivation matches the semantic complexity, so modulo some kind of lexical representation (further discussed below), the word formation processes deriving (1b) from (1a) and (1c) from (1b) each involve the addition, not the deletion, of some kind of decompositional operator(s).

The overarching question of concern below is whether the reverse is ever the case. Specifically, are there word formation operations like the hypothetical ones in (2) (where *bung* is the basic lexeme and *x* and *y* are derivational suffixes), deriving e.g., a change of state verb (2b) from a word naming a result state (2c) and a word naming a simple state (2a) from a change of state verb (2b)?

- (2) a. *bung-x-y* ‘the state of bungness’
b. *bung-x* ‘a change into the state of bungness’
c. *bung* ‘a state of redness brought about by a change into the state of bungness’

Word formation operations like these, if they existed, would be ones that have the effect of removing decompositional operators. As discussed below, the literature is far from absent of claims to the effect that such word formation operations are in existence. I examine data in support of these claims in further detail than they have previously been examined, and suggest that they have been misanalyzed. Instead, when subjected to further scrutiny, the data suggest that there do not, in fact, exist word formation operations that delete decompositional operators in deriving new word meanings. I call this idea, itself a consequence of compositionality, the Monotonicity Hypothesis, and suggest that it is a general property of productive word formation operations that they are constrained by it. I begin with consideration of the aspect of compositionality that the MH might be expected to follow from. I then turn to thoughts about practical matters concerning its evaluation in the domain of word formation operations when considering morphological direction of derivation. Following this, I undertake a case study in the domain of states and changes of state, considering the directions of derivation that are and are not observed in this domain and the consequences of these empirical observations for the MH. I conclude by considering some other predictions the MH makes in other empirical domains, pointing both to additional results and further areas for research in this area.

0.2 What compositionality means for the semantics of word formation

In order to say exactly what predictions the Principle of Compositionality (PC) makes about word formation, ideally one would like a precise definition of it, beyond the vague (representative) statement that:

The meaning of an expression is a monotonic function of the meaning of its parts and the way they are put together (Cann, 1993, 4)

There are many ways of fleshing this out with consequences for the predictions the PC makes, which have been debated in varying degrees of detail in the formal literature (see Janssen 1997 for an overview). I don’t have much to contribute to that particular debate. Instead, I aim to consider one aspect of the PC that most seem to agree upon, context-freeness (Dowty 2007), and consider what it entails for the semantics of productive word formation operations, on the assumption, widely held as illustrated above, that productive word formation

operations that alter lexical meaning are compositional. I then lay out a certain *modus operandi* regarding morphology and its place in word formation, particularly its place in word formation altering lexical meaning. This view, coupled with the predictions of the PC, makes predictions about morphological markedness crosslinguistically in a range of empirical domains. In the sections following, I consider the extent to which the predictions are borne out in the domain of states and changes of state.

0.2.1 Context-free semantics

Dowty (2007, 44ff.) elucidates one aspect of compositionality that he believes to be a good starting point for the empirical study of the issue of compositionality—the extent to which semantic operations are context free (or, strictly local). The idea is that each syntactic operation on syntactic elements is interpreted by a unique semantic operation on the meanings of those elements that tells how to interpret the result of the syntactic operation. As Dowty (2007, 11) points out, the homomorphism model of compositionality (in e.g., Montague 1973) has as a consequence that “... all semantic interpretation [is] “strictly local”—it says in effect that the meaning of any syntactic construction is determined by the meanings of its *immediate* constituents and *only* by those meanings ...” This idea is stated slightly differently in (3), again taken from Dowty (2007).³

- (3) Dowty’s context-free constraint
When you put together meanings α and β by some semantic operation G , $G(\alpha, \beta)$ may depend only on what α and β are, each “taken as a whole”, but may not depend on the meanings that α and β were formed from by earlier semantic operations. (Dowty, 2007, 45)

As Dowty himself points out, this discussion raises the question what “a meaning” is. I take “meanings”, at least of words, to be formulae of a well-defined lexical decompositional language, where the decompositions have model-theoretic interpretations, as in Dowty (1979).⁴ This kind of assumption is

³ As is made particularly clear in Cresswell (1985) and Chierchia (1989) the semantic composition of sentences with propositional attitude verbs like *believe* causes acute problems for this idea. Dowty (2007) does not address such data. Even if Dowty’s constraint has to be given up for sentential semantic composition, however, it still seems worth investigating whether it holds of productive word formation operations, since it is an open question whether operations (semantic, morphological, phonological, etc.) below the word level and above the word level are constrained in the same or different ways.

⁴ The conclusions reached in this section do not depend on the decompositional structures being interpreted model-theoretically. Although I believe it is problematic for unrelated reasons, one can still reject this assumption while still accepting my conclusions.

consistent with both modern lexicalist and non-lexicalist approaches (see §0.2.2.1 for further discussion). With these assumptions, the context-free semantics desideratum entails a context-free syntax for the decompositional language, the language that spells out the meanings of words. That is, the rules that put the various primitive elements of decompositional meaning together are context-free. From this, it follows that rules can't see inside the meanings of lexemes that they put together.

If we follow Dowty in taking context-freeness as a starting point for the study of compositionality and assume, along with those cited above, that productive word formation operations are semantically compositional, then a number of consequences follow. In particular, word formation operations should not alter the internal composition of lexemes they operate on in any way, either (i) by adding material (internal to the operand; external, of course, is predicted by context-freeness) or (ii) by removing material. I call the second of these predictions the Monotonicity Hypothesis (MH), as in (4).⁵

- (4) Monotonicity Hypothesis (Koontz-Garboden, 2007*b*)
 Word formation operations do not remove operators from lexical semantic representations

Although most seem to agree with this idea or something like it, often implicitly, through their endorsement of compositionality in productive word formation (see §0.1 for references), or even more explicitly (Rappaport Hovav and Levin 1998, Dowty 2007 and more opaquely Kuryłowicz 1964, Marchand 1964, and Kiparsky 1982), in practice, as discussed in §0.1 there are a number of phenomena in the literature that have been analyzed with devices that straightforwardly violate the MH. In the remainder of this paper, I discuss the extent to which such rules really are empirically motivated, at least in the domain of states and changes of state. First, however, I turn to the issue of morphological markedness and how it bears on the evaluation of the idea in (4).

⁵ In at least some instances, the removal of material could be restated logically with addition of the right kinds of logical operators internal to an operand, thereby violating the first consequence of context-freeness above. To the extent there is an empirical gap predicted by one or the other of these, then, it may not be immediately clear from what property of context-freeness it follows. I believe a good starting point, however, is simply examining what the empirical landscape is—in particular, do there even exist word formation operations that could conceivably be analyzed with deletion operations? To the extent there do not, as I argue below, we know for certain that this type of rule does not exist. It may well be that the gaps discussed below implicate non-existence of yet other types of rules as well, but at this stage, I think it important to establish in particular that there are not deletion operations, given that they are commonly invoked in analyses of particular phenomena.

0.2.2 *The role of morphology*

0.2.2.1 The MH and theories of morphology The nature of the theory of morphology within which the study of the semantic side of word formation is undertaken might seem like a matter that evaluation of the MH might hinge upon. So far as these matters are concerned, however, I believe most theories agree. Theories of word formation seem to be split along two major axes: (a) whether they adhere to lexicalism (Chomsky, 1970) or not (McCawley, 1968; Marantz, 1997) and (b) whether or not affixes are treated as lexemes (Lieber, 1980) or as realizations (Beard, 1995) of word formation rules (see Beard 1998 for an overview of this issue).⁶ Although my terminology often presupposes a lexicalist and lexeme-based approach to morphology, neither of these assumptions makes any difference in either the predictions or the evaluation of the MH. This is the case because the MH is simply a hypothesis about what kinds of meanings can be derived from what kinds of meanings; it has nothing to say about the structural side of word formation.

Concerning the lexicalist/non-lexicalist divide, practitioners of both kinds of theories commonly presuppose decompositional representations for the meanings of lexemes and treat, explicitly or implicitly, the semantics of word formation as the alteration of the decompositional representation. This decompositional representation is the real core assumption upon which the implementation of the MH that I have laid out above rests, and this much is common to both lexicalist and non-lexicalist approaches to word meaning. It makes no difference whether these representations are treated as syntactic objects (Pesetsky, 1995; Hale and Keyser, 2002; Embick, 2004; Arad, 2005) or lexical ones (Levin and Rappaport Hovav, 1995; Kiparsky, 1997; Wunderlich, 1997). The prediction is the same. Word formation operations (or their non-lexicalist equivalents) do not remove decompositional operators. In my discussion, I adopt lexicalist parlance, but purely as a matter of convenience; the results do not rely on any assumptions one way or another.

Regarding the divide in the morphology literature between morpheme-based (Lieber, 1980) and realizational-based approaches (Halle and Marantz, 1993; Aronoff, 1994; Beard, 1995), again, so far as I can see, the choice of a particular theory has no impact on the MH. The difference in theories is simply about what kinds of objects morphemes are—so far as I am aware, both kinds of theories will nevertheless tend to agree for a given pair of derivationally related lexemes, which is the derived and which is not. This, as discussed further in the section that follows, is what really matters for evaluation of the MH.

⁶ Stump (2002, 1ff.) has an enlightening discussion of differences among theories of inflectional morphology that has inspired, at least in part, the present discussion.

0.2.2.2 Morphological markedness, derivation, and evaluation of the MH

Of crucial importance in evaluating the empirical validity of the MH, is some clear criterion for determining direction of morphological derivation, so that it can be determined independent of the meanings of the lexemes, which is derived from which.

One methodological assumption I make in this vein is that in the absence of compelling evidence to the contrary, for a pair of lexemes sharing a root where one lexeme is morphologically marked and the other is not, the marked is derived from the unmarked. This criterion leads to the conclusion, for example, that for the pairs in (5), the meanings of the words in (5b) are derived from the meanings of the words in (5a).

- (5) Some adjective/deadjectival verb pairs in English (Levin, 1993)
- a. awake, bright, broad, cheap, coarse, damp, dark, deep, . . .
 - b. awaken, brighten, broaden, cheapen, coarsen, dampen, darken, deepen, . . .

This methodological operating principle, stated in (6), I call Taking Morphology Seriously, following use of the phrase in lectures by Paul Kiparsky (see also Donohue (2004) for discussion of the idea in the context of morphosyntactic case).⁷

- (6) Taking Morphology Seriously
For a morphologically marked/unmarked pair of lexemes sharing a common root and where at least one of the variants seems to be generated by a productive derivational process, in the absence of evidence to the contrary, assume the marked is derived from the unmarked, the latter taken to be lexically listed.

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

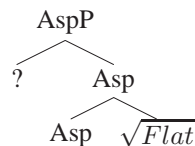
Regarding subtractive morphology and zero morphemes, it must be borne in mind, as discussed above, that the MH is a hypothesis not about morphology, but about lexical semantics, and that morphological spellout is independent of it.

⁷ The notion of *iconicity* in the functionalist literature (Givón, 1984; Bybee, 1985; Haiman, 1985; Haspelmath, 1993) is probably rightly taken as quite similar to (6). The difference, I think, is in my taking (6) to be merely a methodological operating assumption, which can be overridden in the presence of evidence, versus iconicity being taken as a larger-level theoretical principle. For me, (6) has no theoretical status.

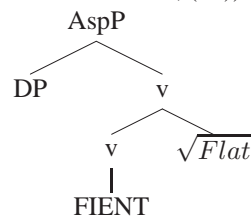
Thus, both of these kinds of processes are entirely consistent with the MH, so long as they mark the kinds of word formation operations in compliance with it. A subtractive morphological operation, for example, would not violate the MH so long as it does not result in the deletion of decompositional operators. Similarly for zero morphology—so long as the zero morpheme does not remove a decompositional operator, the MH says nothing about the extent to which a zero morpheme should or should not exist. Nevertheless, my *methodological* assumption (reified in (6)) is that there is a non-trivial relationship between overt morphological derivation and lexical semantic derivation, so that overt morphology can, in the absence of evidence to the contrary, be used as a proxy for derivational relationships in lexical semantics, i.e., in order to tell which word meaning is basic and which is derived. Now, if there is compelling evidence that in a morphologically marked/unmarked pair sharing a common root that a zero morphological or subtractive morphological process it at work, this is no problem for the MH, so long as the lexical semantic result of the operation is not deletion of decompositional operators.

Related to this issue is the Root Hypothesis, most explicitly discussed by Arad (2005). For pairs like *red/redden* discussed above and other basic/derived lexeme pairs like it, some would assume a more abstract, lowest common denominator root, from which both lexemes are derived, the “unmarked” member by a zero morpheme. This is the case, most clearly, of work in this area by Embick (2004), who gives the representations in (7a,b) for a simple state like *flat* and an intransitive COS verb like *flatten* respectively.⁸

- (7) Simple state and COS words in Embick (2004)
 a. Simple state (cf. Embick 2004:363, (19))



- b. COS verb (Embick 2004:365, (27))



⁸ The question mark in the tree in (7a) is Embick’s.

At least with stative words and verbs derived from them, on Embick’s theory, the functional head *Asp*, which derives an adjective from a precategorial root, is morphologically null, while *FIENT*, which derives an intransitive *COS* verb from a precategorial root, is generally overt, realized by *-en* in English.⁹ The fact that *Asp* is morphologically null is taken to be entirely accidental, and as a consequence, words naming simple states and verbs naming changes into them are taken to be of equal morphological complexity, with both derived from a common morphological root, the core of the Root Hypothesis. There are many others that appear to take a similar approach (Pesetsky, 1995; Arad, 2003; Doron, 2003; Jackson, 2005; Levinson, 2007). What is special about this hypothesis is not so much that it has it that there is a lowest common denominator root from which both lexemes are derived, but rather that this is the case for all languages, even for those where it doesn’t appear on the surface to be the case (e.g., English).¹⁰ Such an approach is certainly consistent with the MH. The primary reason I choose not to adopt it in a broad fashion here, however, is because some of the arguments for such an abstract root, particularly in languages where there is no morphophonological evidence for the root, actually rely on *implicit assumption of the MH*. For such languages, assuming the Root Hypothesis prejudges the question.¹¹ Consider, for example, Pesetsky’s (1995:72ff) argument for the root from psych verb causative/nominalization

⁹ And by some other morphology crosslinguistically, as verbs naming changes into simple states are generally derived from state-denoting words overtly (Koontz-Garboden 2005; 2006), though see Koontz-Garboden (2007a) for a type of case in which they are not.

¹⁰ In actual fact, the Root Hypothesis in this context, when considered against the empirical observations in Koontz-Garboden (2005), raises troubling concerns. As outlined, on this approach, adjectives like *flat* and verbs like *flatten*, are of equal morphological complexity, both derived from a common root. In English, it is simply considered accidental that the affix effecting the derivation of *flat* from its root is morphologically null. Crosslinguistically, however, it turns out that words naming states like *flat* (so called property concept states; Dixon 1982), are very commonly morphologically simple, in contrast with verbs naming changes into those states (Koontz-Garboden, 2005). On this approach, then, these too are derived by null morphology. That a theory should have it that in so many languages a morpheme with the same function should have identical phonological shape seems highly suspicious. I believe instead, in keeping with the tenant of Taking Morphology Seriously above, that this state of affairs suggests such words are not derived, but instead morphologically simple. This issue, however, is tangential to the matter at hand—as stated above, the Root Hypothesis is perfectly consistent with the MH. I am simply unconvinced that it is supported by the facts in its universal guise.

¹¹ And in fact, Pesetsky (1995, 71) admits as much:

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

pairs like *amuse/amusement*.¹² Pesetsky argues that while transitive *amuse* has a causative meaning akin to ‘x cause y to be amused’, the nominalization *amusement*, apparently derived from this verb, lacks causative meaning, referring to a state of being amused rather than to a causative event of being amused.¹³ Observing these facts, Pesetsky then goes on to ask a telling rhetorical question, following it with an even more telling answer:

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

Pesetsky’s logic seems to be that derivational operations cannot remove causative semantics; because of this, it must be the case that the non-causative nominalizations and the causative verbs come from some more abstract source that lacks causative meaning—the root. The assumption that Pesetsky is drawing on, of course, is precisely the MH.

Of course, there is nothing wrong with making this methodological assumption, especially if the MH is empirically well-founded, as I believe it to be. If however, the MH is to be treated as an empirically falsifiable hypothesis, which seems to me a good starting point given that not everyone assumes it to actually be true, at least in practice, then assuming a theory of derivational morphology that takes it as axiomatic makes empirical investigation of it impossible. Because I seek to cast the MH as such a hypothesis, I do not universally assume the Root Hypothesis, at least as a claim about the existence of the root as an object to be found in all languages. This is, of course, not to say that the notion of the morphological root is not well-supported in particular languages.¹⁴ The observation is, quite simply, that one cannot empirically evaluate a hypothesis about the semantic outcome of derivational operations if the evidence for the

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

¹² An argument of a similar nature is given in Marantz (1997, 219ff.), drawing on Chomsky’s (1970) exposition of the potential transitivity of *grow* versus the intransitivity of *growth*. In that particular instance, I think the facts have been misunderstood. See Wechsler (2008) for clarifying discussion and observations.

¹³ I am not sure that I agree with Pesetsky’s characterization of the facts; it is unimportant, however. My concern here is simply to illustrate the fact that some of Pesetsky’s argumentation for the Root Hypothesis crucially implicitly assumes the MH.

¹⁴ See e.g., the case of Ulwa in Koontz-Garboden (2009b), though note that while the facts there support the notion of a morphological root, they do not support the lexical semantic side of the Root Hypothesis (as discussed in more detail in Koontz-Garboden 2010b).

direction of derivation is itself based on semantic evidence. Evidence for the direction of derivation must instead come from other domains (e.g., syntax, phonology, morphology) in order to keep the semantic issues separated from the issues of morphological derivation. In some cases such evidence points in the direction of the existence of the root as a morphological entity. In other cases it does not unambiguously point in this direction. As such, each case must be evaluated individually on the basis of the morphosyntactic evidence to determine morphological direction of derivation independent of lexical semantics.

0.3 Property concepts versus result states

Having clarified the nature of the MH and the role of morphological markedness in its evaluation, in the sections that follow I turn to a case study, examining the relationship of words naming states, such as those illustrated in (8) to words naming changes into those states, as exemplified in (9).

(8) *red, long, broken, cracked*

(9) *redden, lengthen, break, crack*

As I show, in light of what is generally known about the lexical semantics of words such as those in (8), the MH makes several straightforward predictions about possible and impossible derivational relationships of them to words like those in (9). These predictions are borne out by crosslinguistic investigation. Among the less celebrated findings of Dixon’s (1982) now classic study on adjective typology is that the class of stative meanings that tend to be named by morphologically simple adjectives (e.g., *flat* above), henceforth *property concept states*, contrasts with another class of stative meanings “... that are the result of some action” (1982:50). As discussed in Koontz-Garboden (2005), these two classes of stative meanings differ from one another in their entailments.¹⁵ While result states entail that there was an event giving rise to the resulting state named by the word, this is not the case for property concept states. The contrast in entailment behavior between property concept states and result states is illustrated quite clearly in English by morphologically basic adjectives, which name property concept states, and their corresponding deverbal adjectives, which name result states that entail a change into the property concept state. The contrast is exemplified in (10)–(12).

(10) a. Look at the bright picture on your left.

¹⁵ Of course, what I mean is that sentences in which these words are used differ in their entailments. Because the source of the difference in entailment behavior can be traced to the state-denoting words, I speak of entailments of words for simplicity.

- b. Look at the brightened picture on your left.
- (11) a. Kim ate a red apple.
- b. Kim ate a reddened apple.
- (12) a. Sandy’s shirt has long sleeves.
- b. Sandy’s shirt has lengthened sleeves.

The data in (10)-(12) illustrate a minimal contrast between property concept states and result states. While the picture in (10a), for example, is inherently bright, the picture in (10b) had to undergo some sort of brightening process in order to reach the result state brightened. Things are similar for the apple in (11)—whereas in (11a), the apple can just be inherently red, the apple in (11b) had to become (more) red via some sort of reddening process. The data in (12) illustrate the same kind of contrast. While (12a) makes no claim as to whether Sandy’s sleeves underwent some process in order to be long, there has to be some sort of lengthening process in (12b).¹⁶

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

0.3.1 Lexical semantic representations

Result states In this section I develop an analysis of the meaning of result states that informs predictions made by the MH with regard to their derivational relationship to words naming changes of state. In laying out this analysis, I draw on previous analyses of result states in the literature (Parsons, 1990; Piñón, 1999; Kratzer, 2000; Deo, 2006; Condoravdi and Deo, 2008; Koontz-Garboden, 2010a), which are couched in a semantics with events (Davidson, 1967; Bach, 1986; Parsons, 1990), which I also assume.¹⁷

To begin, consider again a sentence headed by a result state predicate as opposed to one headed by a property concept state predicate, as in (13).

- (13) a. Kim saw the *reddened* dirt.

¹⁶ Of course, as a reviewer points out, something that is e.g., *lengthened* need not be long. This property of degree achievements (Dowty, 1979) is unproblematic and tangential to the issues discussed here.

¹⁷ My aim in this paper is to keep formalization no more complex than necessary, so as to not obscure the larger issue concerning the MH. Ultimately, I believe a much more articulated lexical semantics for adjectives and words derived from them is necessary, along the lines laid out by Kennedy and Levin (2008) and discussed in more detail in Koontz-Garboden (2010a). That level of detail is not required by the discussion below, however, so I keep things more simplified for expository purposes. Everything I say can, however, be recast in terms like those in Koontz-Garboden (2010a).

b. Kim saw the *red* dirt.

While the dirt Kim saw in (13a) is necessarily red as a result of some prior event of reddening, this is not the case in (13b). More specifically, the dirt in (13a) is red at the event time as a result of the prior event and, crucially, prior to participating in that event, it could not have been the case that it was already red; in such a situation (13a) would be infelicitous.

Result state meanings are typically generated by positing some kind of result state operator that takes an eventive verb as an argument and maps it to its result state (Piñón, 1999; Kratzer, 2000; Deo, 2006; Koontz-Garboden, 2010a). I formalize this in (14) (where P ranges over functions from individuals to stative eventualities to events).

$$(14) \quad \lambda P \lambda x \lambda s \exists e [P(e, s, x)]$$

The derivation in (16) illustrates how the meaning of the result state named by *reddened* is derived compositionally from the result state operator and the meaning of the intransitive COS verb *red*, whose decompositional representation is given in (15).¹⁸

$$(15) \quad \text{red} \rightsquigarrow \lambda x \lambda s \lambda e [BECOME(e, s) \wedge \text{red}(s) \wedge THEME(s, x)]$$

$$(16) \quad \text{red} + \text{ed} \rightsquigarrow \\ \lambda P \lambda x \lambda s \exists e [P(e, s, x)] (\lambda x \lambda s \lambda e [BECOME(e, s) \wedge \text{red}(s) \wedge \\ THEME(s, x)]) = \\ \lambda x \lambda s \exists e [\lambda x \lambda s \lambda e [BECOME(e, s) \wedge \text{red}(s) \wedge \\ THEME(s, x)](e, s, x)] = \\ \lambda x \lambda s \exists e [BECOME(e, s) \wedge \text{red}(s) \wedge THEME(s, x)]$$

On the view laid out here, a result state like that named by *reddened* denotes a function from entities to sets of *red* states which are preceded by a reddening event.

¹⁸ For the purposes of the formalization in (16), I treat the argument of the result state operator as the meaning of an intransitive, rather than transitive verb. This is almost certainly not the right treatment for all result states in all languages. For example, *killed* as in *the freshly killed chicken*, is quite clearly derived not from intransitive *die*, but from transitive *kill*. With what kinds of events and with what kind of crosslinguistic variation words naming result states are derived from intransitive or transitive COS verbs is a matter worthy of further research, but which goes beyond the scope of the present study (though see Meltzer-Asscher 2010 for some interesting claims and observations). Thus, on the analysis I lay out here, a separate operator would be required for the derivation of a result state predicate from a transitive verb. In addition to existentially binding the event argument, this operator would also have to existentially bind the external argument of the transitive verb.

Property concept states Contrasting with result states, property concept states do not entail a prior event giving rise to the state. They simply denote functions from ordinary individuals to sets of states, a denotation which follows from the decompositional representation I give to property concept states, illustrated for the property concept state word *red* in (17).

$$(17) \quad \text{red} \rightsquigarrow \lambda x \lambda s [\text{red}(s) \wedge \text{THEME}(s, x)]$$

While the representation in (17) allows that there *could* be a prior event giving rise to the state, this is not specified as part of the lexical meaning of the word, and it can therefore be the case that there either is or is not such a preceding event. The difference, then, between result states and property concept states, as illustrated in (13), is that the meaning of the former includes a COS event, while the meaning of the latter is a basic, primitive state meaning, underspecified for whether there was a change giving rise to the state or not.

0.3.2 Predictions of the MH for the two kinds of states

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

$$(18) \quad \begin{array}{l} \text{a. } \lambda x \lambda s [\text{red}(s) \wedge \text{THEME}(s, x)] \\ \text{b. } \lambda x \lambda s \lambda e [\text{BECOME}(e, s) \wedge \text{red}(s) \wedge \text{THEME}(s, x)] \\ \text{c. } \lambda x \lambda s \exists e [\text{BECOME}(e, s) \wedge \text{red}(s) \wedge \text{THEME}(s, x)] \end{array}$$

Given that the property concept state meaning (18a) is included in both the COS (18b) and the result state (18c), the MH predicts that although words naming the latter two kinds of meanings could be derived from words naming property concept states, words naming property concept states could never be derived from either words naming changes of state or from words naming result states. Either derivation would involve at least the deletion of a BECOME operator, and would therefore violate the MH. By contrast, because the result state contains both the meaning of the PC word and the COS verb, the MH predicts that words denoting result states *could* be derived from either of these.¹⁹

In addition to exemplifying the semantic contrast between result states and property concept states, the data in §0.3 also show that in English there is a morphological distinction to be made between words naming property concept

¹⁹ Though they need not be—the MH allows them to be but does not preclude such meanings being lexicalized by monomorphemic words.

states and words naming result states. While words naming property concept states in English are monomorphemic, those naming result states tend to be morphologically complex, and are commonly derived from the verbs naming the events giving rise to the result state (rather than the reverse).

This semantic contrast between result states and property concept states is reflected morphologically in other languages as well. Koontz-Garboden (2005) and Koontz-Garboden and Levin (2005) have shown that in Quechua, Tongan, and Eastern Armenian, the same state of affairs holds—words naming property concept states are underived while words naming result states are indeed derived from words naming change of state events. Data reported by Smith (2006) on Pima (Uto-Aztecan), given in (19), suggest that the same sort of contrast in derivational behavior between words naming property concept states and words naming result states is found in this language as well.²⁰

(19) Pima state-denoting predicates (Smith, 2006)

adjective	non-causative COS	causative COS
ge'e 'big'	ge'e-da 'become big'	ge'e-da-jid 'make big'
moik 'soft'	moik-a 'become soft'	moik-a-jid 'make soft'
hain-s 'broken'	'e-hain 'become broken'	hain 'make broken'

The table in (19) shows that there are certain words naming states that are morphologically simple and whose meanings correspond to those of Dixon's (1982) property concept states (i.e., *ge'e* and *moik*). By contrast, there are other state-denoting words, like the word for “broken” in (19), that are morphologically complex, derived with the suffix *-s*, which generally seems to mark the derivation of a result state in Pima (Jackson 2004, 2005; Koontz-Garboden 2010a).

Thus, data from several genetically diverse languages lead to the conclusion that, as predicted by the MH, in the general case words naming property concept states are not derived from words naming result states or changes into states, while words naming result states are indeed derived from words naming changes of state. In the remainder of the paper I discuss a more problematic case, where deverbal adjectives are claimed to have property concept meanings. I.e., on the surface, it appears that a word denoting a PC state is derived from a word denoting a COS event, a derivation that, as discussed above, would entail the deletion of decompositional operators, in violation of the MH. I then show through more detailed examination of the phenomena that the situation is more complicated than has generally been appreciated and that it does not involve a

²⁰ The process deriving an inchoative from a stative is actually phonologically more complicated than suggested in (19), having to do with phonological weight. The details of this process are irrelevant for my purposes, and I have therefore chosen to give the surface forms. See Smith (2006) for details.

deletion operation. Instead, once the facts are understood in greater detail, they support, rather than counterexemplify, the MH.

0.4 Deverbal adjectives with property concept meanings: Derived statives

As discussed above, the MH predicts that adjectives derived from COS verbs inherit the meaning of the verb that they are derived from. I.e., they name result states, states that entail there was an event of the kind named by the verb they are derived from giving rise to the state, not property concept states, which have no such entailment. In light of this prediction, the contrast that Nedjalkov and Jaxtonov (1988) make between deverbal adjectives that do (“resultatives”) and don’t (“statives”) have event implications seems like it should not exist:

“... the term resultative is applied to those verb forms that express a state implying a previous event. The difference between the stative and the resultative is as follows: the stative expresses a state of a thing without any implication of its origin, while the resultative expresses both a state and the preceding action it has resulted from... sometimes the past passive participle [otherwise a resultative] may be a stative”(Nedjalkov and Jaxontov, 1988, 6)

Dubinsky and Simango (1996) also prominently claim the existence of derived statives in Chichewa, specifically for adjectives derived from verbs with the suffix *-ika*. As they discuss, and as is illustrated by the data in (20), such forms do not seem to entail that there was an event of the kind named by the verb giving rise to the state named by the form in *-ika*.

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

Although the branch in (20) is characterized as *bent*, there is no conventional sense in which it has undergone a bending event, as explicitly stated in (20). The deverbal adjective *bent* can, in fact, also be used this way in English, as illustrated by the data in (21) (cf. similar observations by Kratzer (2000, 8ff.) on *obstruct* and *obstructed*).²¹

²¹ An anonymous reviewer raises the interesting data from Catalan in (i), which the reviewer suggests show that for *bent* there is not only a result state variant in Catalan (ia), but a PC variant as well (ib).

(21) The bent tree branch has never been bent; it just grew that way.

In fact, derived statives actually turn out to be robustly represented in English. This is illustrated by the additional data in (22).²²

- (22) a. He has no scars but there is a slightly **darkened** portion of skin on his right leg, near the femoral artery, which he has had since birth and is in the crude ...
<http://www.adventdestiny.com/forum/archive/index.php?t-2820.html>
- b. Lower **Knoll**, is a **sunken** area of land that is located on the eastern side of the Avenues, area in Exmouth and lies above the Maer Valley.
http://www.eastdevon.gov.uk/reportdc_120108_07_3421.out.jb.pdf
- c. Elementary school writing paper is manufactured with **broken** lines on it. (Itamar Francez, p.c.)

There is no sense in which the skin in (22a) has been darkened, the valley in (22b) has sunk, or the lines in (22c) have broken. These are all instances where the deverbal adjective seemingly fails to entail there was an event of the kind named by the verb they are derived from giving rise to the state named by the derived adjective, and as such, they seemingly counterexemplify the MH, since they would appear to require a derivational operation in which the eventive component of the COS verb is lost in the derivation of the deverbal adjective. And in fact, the analysis of the Chichewa facts in Dubinsky and Simango (1996), given in (23), explicitly appeals to a deletion operation of precisely the kind

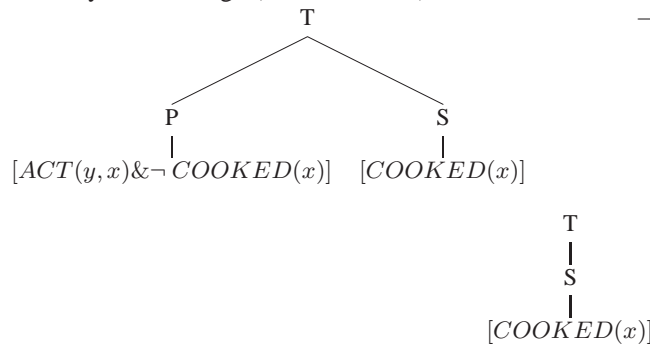
- (i) a. #Aquesta branca **torçada** de l'arbre no l'ha torçada res ni ningú; simplement va créixer així.
 'This bent branch of the tree hasn't been bent by anything or anyone; it simply grew this way.'
- b. Aquesta branca **torta** de l'arbre no l'ha torçada res ni ningú; simplement va créixer així.
 'This bent branch of the tree hasn't been bent by anything or anyone; it simply grew this way.'

This may well be the right analysis of these facts. Alternatively, however, it could be that *torta*, despite being morphologically simple, does lexicalize a result state of the derived stative variety. Further data of the kind discussed below would be necessary to test this. Either way, the facts are consistent with the discussion here—the MH predicts that derivational operations are meaning preserving. But any kind of meaning can be lexicalized by a monomorphemic lexeme, at least so far as the MH is concerned, so long as words derived from it do not remove operators from its lexical semantic representation.

²² This and other data and arguments in this section are from Koontz-Garboden (2010a).

precluded by the MH—one in which material present in the operand of the word formation rule is removed in the derivation of the meaning of the derived word.

- (23) Stativization of Chichewa *phika* ‘cook’, via suffixation of *-ika* in Dubinsky and Simango (1996, 771-772)



In Koontz-Garboden (2010a), I give an explicit analysis of derived statives like those illustrated in (22), showing that the facts surrounding them are more complicated than has previously been appreciated. Specifically, I show that their meanings are not derived by a deletion operation from COS senses, as has been previously presumed. Instead, I show that verbs that allow derived stative derivatives all have what Gawron (2009) calls *extent* uses, and what have been called in previous literature *fictive motion* uses (Langacker 1986:464; Matsumoto 1996; Talmy 2000:Chapter 2). These are uses of COS verbs, illustrated in (24), in which the change, rather than taking place in a temporal domain, instead takes place in a spatial domain.

- (24) a. His skin darkens on his right leg near the femoral artery.
 b. The valley sinks even further five miles ahead.
 c. The line breaks right at the point where you’re supposed to begin the sentence.

In (24a), for example, if one views the leg as an axis, as one travels along it, from one point to another near the femoral artery, the color of skin changes. Such uses are, then, change of state uses; it’s just that the change, as discussed in detail by Gawron (2009) and Koontz-Garboden (2010a), is spelled out in the spatial, rather than in the temporal domain. Crucially, however, in the same example, and in all extent uses of COS verbs, there is no *temporal* change; the claim in (24a) is not that the speaker is observing a change in the color of the person’s skin from one moment to the next. Given, then, that there are non-temporal uses of COS verbs, it is entirely expected that there would be adjectives derived from these senses in which no temporal change is implicated. Instead, if the meaning of the verb is preserved in the meaning of the deverbal adjective, as expected given the MH, a spatial change should be implicated. In the same way, then, that

result states are derived from temporal uses of COS verbs by existential quantification of a (temporal) event, derived statives, I claim, are derived from extent uses of COS verbs through existential quantification, but of a spatial, rather than a temporal, event. In the sections that follow, I summarize some of Koontz-Garboden’s (2010a) arguments for this claim,²³ showing along the way that a theory of derived statives based on a deletion operation, like that of Dubinsky and Simango (1996) illustrated above, fails to capture the empirical observations. The upshot is that there is no support for deletion operations in the semantics of word formation from the domain of derived statives.

0.4.1 Prediction 1: Meaning contrasts

The claim that derived statives, at least in English, are derived from extent uses of COS verbs compositionally (rather than from temporal COS uses by a deletion operation like that described above), predicts that derived statives do not have meanings on a par with property concept meanings; they do not fail to entail that there was an event giving rise to the state they name. Such a theory predicts that they do entail there to have been a preceding event of change, but that it is a spatial change, rather than a temporal change.

This prediction is borne out by the facts. The contrast can be seen clearly by considering the contrasting sentences in (25).

- (25)
- a. The road is wide. (property concept state)
 - b. After the work of the road crew, Lafayette had a widened I65. (result state)
 - c. I65 is widened at Lafayette city center. (derived stative)

As already illustrated in §0.3, there is a contrast between property concept state meanings like (25a) and result state meanings like (25b), in that while result state meanings entail a prior change, property concept meanings do not. A deletion theory of derived statives predicts, in deleting all change components in the meaning of a COS verb leaving behind just the stative core, that the meaning of a derived stative like *widened* in (25c) is identical to its property concept counterpart in (25a). This prediction, however, is not borne out by the facts. Rather, the meanings of *wide* in (25a) and *widened* in (25c) contrast with one another in that (25c) entails that there is a preceding spatial change, i.e. that there are portions of the road with a lesser degree of width, hence the contradiction in (26).

- (26) #I65 is widened at Lafayette city center. In fact, it’s of the same width for its entire extent.

²³ I leave out an argument from adverbial modification in the interest of space. See Koontz-Garboden (2010a) for the full details.

The morphologically simple adjective *wide*, by contrast, certainly allows that the point on the scale that it is predicated of is preceded by others having a lesser degree of width (27), but unlike (25c), does not entail it, viz, (28), which is crucially non-contradictory.

- (27) I65 is wide at Lafayette city center, but not in Gary.
 (28) I65 is wide at Lafayette city center. In fact, it’s the same width for its entire extent.

The observation, then, is that while morphologically simple adjectives entail nothing about how the state they name came about, deverbal adjectives always entail that there was an event of a kind named by the verb they were derived from giving rise to the state that they name. With at least some change of state verbs (more on this below), the verb can describe change in a temporal *or a spatial* domain. Given this, compositionality correctly predicts that an adjective derived from such a verb could name a state preceded by an event of either temporal or spatial change. Further, this prediction contrasts clearly with the prediction made by a deletion analysis of derived statives, like that of Dubinsky and Simango, in which the state named by a derived stative is precisely a property concept state. Again, the data in this section have shown that prediction to be false. As such, a deletion analysis is unsupported, which is expected given the MH.

0.4.2 Prediction 2: COS verbs lacking extent uses lack derived stative derivatives

A second way in which the analysis of derived statives in Koontz-Garboden (2010a) differs from a deletion analysis is in whether all COS verbs are predicted to have derived stative derivatives or not. On the extent-verb theory, only verbs that have extent uses are predicted to have derived stative derivatives. By contrast, on an MH-violating deletion analysis like that of Dubinsky and Simango (1996), the change component of the meaning of a change of state verb is removed, leaving behind only the stative component. This operation is not sensitive to whether a particular COS verb has an extent use or not, and as such, any COS verb is predicted to have a deverbal state-denoting derivative failing to entail a prior event.

As predicted by the MH, the facts do not support the deletion theory. Consider *cook*, as it happens, the verb that Dubinsky and Simango illustrate their analysis with (see (23)). This is a COS verb with a stative core, and as such, Dubinsky and Simango predict that it should have a derived stative (generalizing their analysis to English). As shown by the data in (29), it does not (and it is hard to imagine it really does in Chichewa, either).

- (29) #The portion of meat between the rib and the joint is cooked, but has never been cooked.

The absence of a derived stative derivative of *cook* is a mystery on the deletion analysis. By contrast, on the extent-verb based analysis, the absence of a derived stative meaning for *cooked* in (29) is predicted, given the fact that the verb *cook* itself does not have extent uses, a fact shown by the data in (30) (e.g., in a context where the degree of cookedness of the meat changes spatially between the rib and the joint).

(30) #The side of beef cooks between the rib and the joint.

As the verb *cook* is acceptable only in contexts involving temporal change, the extent-verb analysis correctly predicts, by contrast with the overpredicting deletion analysis, that it has no derived stative derivative. As shown in Koontz-Garboden (2010a), the same state of affairs holds for cooking verbs more generally, manner of killing verbs (Koontz-Garboden and Beavers, 2011), and most likely others. The bottom line is that the extent-verb analysis correctly predicts that only COS verbs that can encode spatial change have derived stative derivatives. By contrast, a deletion analysis incorrectly predicts that there are derived stative derivatives of all COS verbs, since all COS verbs have a stative core. This is not the case.

0.4.3 Prediction 3: Morphological syncretism in derived statives and result states

On Koontz-Garboden’s (2010a) analysis, derived statives and result states have the same kind of denotation and are derived by a single morpheme with a single denotation; the semantic difference between the two comes from the denotation of the verb the adjectivizing morphology takes as an argument. Given this, it is expected that crosslinguistically, we would find that the morphology deriving a derived stative from a verb would be the same as the morphology deriving a result state. I.e., syncretism should be fairly common. By contrast, on a deletion theory, result states and derived statives both have very different kinds of denotations, and the semantic operation giving rise to their meanings is also very different, since result states cannot possibly be derived through a deletion operation like the one laid out by Dubinsky and Simango (1996) and discussed above.²⁴ This is a prediction that requires a proper typological study to verify. I have not undertaken such a study, but in many cases that I am aware of (see the appendix in Koontz-Garboden 2010a), such as Chichewa (Dubinsky and

²⁴ One might object that result states could really come about through contextual augmentation of the meaning of an underspecified derived stative, so that the two could actually have the same kind of meaning on a deletion theory. And in fact, a theory not entirely unlike this is proposed by Condoravdi and Deo (2008). The facts in the previous section, however, argue against such a theory, since it would predict that all deverbal adjectives have derived stative uses.

Simango, 1996), Indo-Aryan (Condoravdi and Deo, 2008), and Pima (Jackson, 2005), there is indeed syncretism.

Derived statives as analyzed previously in the literature, particularly by Dubinsky and Simango (1996), represent a prominent apparent counterexample to the MH. What I hope to have shown in this section, in summarizing some of Koontz-Garboden’s (2010*a*) observations, is that although derived statives are special and in need of attention, when examined in further detail, a deletion analysis does not fit the facts. Whether an extent-based analysis like the one I have suggested in Koontz-Garboden (2010*a*) is correct or not, I have shown that several predictions made by the deletion analysis of this phenomenon are simply not borne out by the facts. As such, derived statives are not properly taken as a counterexample to the MH. Rather, they are a kind of exception that proves the rule.

0.5 Discussion and concluding remarks

In this paper I have sought to lay out a falsifiable hypothesis about the semantic nature of word formation, suggesting on the basis of previous literature that word formation operations do not effect deletion operations on lexical semantic representations. I have discussed why this hypothesis, the Monotonicity Hypothesis, might reasonably be expected to hold, despite analytical behavior in the literature that might suggest otherwise, and have suggested a methodology for putting it to the test that is rooted in morphological markedness and semantic analysis. I went on to consider the predictions of this hypothesis in a specific empirical domain. Contrary to some analyses that clearly violate the MH, I have shown that at least in the domain of states and changes of state, deletion analyses actually make incorrect predictions, and that instead, there is an empirical gap. Precisely the behavior that would be expected if word formation operations really could effect deletion operations is absent—words with property concept state meanings are not derived from change of state verbs. In instances where the situation appears contrary to these observations, a more thorough understanding of the facts shows this not to be the case. These observations, of course, raise the question whether the MH holds more generally, or whether these facts are simply peculiar to this domain. I believe there is good reason to believe it to be true more generally.

As briefly discussed in §0.1, perhaps the most prominent phenomenon to be analyzed with a deletion operation is anticausativization, the process illustrated by the Spanish data in (31) whereby a verb naming a change into a state (31*a*) is morphologically derived from a verb naming a caused change into that state (31*b*).

- (31) a. romper-se ‘become broken’

b. romper ‘cause to become broken’

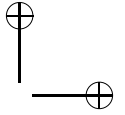
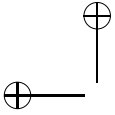
It is widely assumed in the literature that a verb like (31a) has a meaning that can be represented broadly as something like (32a), and that the meaning of (31b) includes this meaning in addition to a CAUSE operator, the causing event, and the causing event’s associated theta role.

- (32) a. Inchoative
 $\lambda x \lambda s \lambda e [BECOME(e,s) \wedge THEME(s,y) \wedge \phi(s)]$
 b. Causative
 $\lambda x \lambda y \lambda s \lambda e [\exists v [CAUSE(v,e) \wedge EFFECTOR(v,y) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge \phi(s)]]$

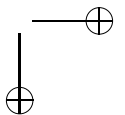
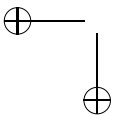
Based on these assumptions, the received analysis of anticausativization is that an inchoative like (31a) is derived from a causative like (31b) by way of deletion of the CAUSE operator present in the representation of the latter. Grimshaw’s (1982) inchoativization (=anticausativization) rule in (33) is representative.

- (33) Grimshaw’s (1982:103ff.) inchoativization rule
 $Pred_{cause}: CAUSE(x, BECOME(Predicate(y))) \longrightarrow$
 $Pred_{inch}: BECOME(Predicate(y))$

In Koontz-Garboden (2009a), I show that much in the way that the deletion analysis makes the wrong predictions for derived statives, it also makes a series of incorrect predictions as an analysis of anticausativization. Instead, I show that treating anticausativization as a reflexivization process in the spirit of Chierchia (2004) best captures the facts of the phenomenon, making a series of correct predictions that distinguish this analysis from others, the deletion analysis in particular. Most importantly in the context of the present discussion, the facts show that inchoatives derived from causatives by anticausativization retain the CAUSE operator (and associated thematic structure) present in the causative verb that they are derived from; anticausativization, properly analyzed, does not involve a deletion operation, and as such, is not counterevidence to the MH. Rather, as with the case of derived statives, it offers further support for it. Beyond these areas, Koontz-Garboden (2007b, Chapter 9) lays out a series of other predictions the MH, at least naively, makes and which merit additional investigation. Among these are: the relationship of manner (e.g., *run*) to manner plus path (e.g., *run to*) verbs; the derivation of result nouns (e.g., *a laugh, a fart*, etc.); denominal locatum and location verbs; augmentative and diminutive derivation; and applicatives. Also in need of investigation, particularly in light of claims made by Rothstein (2004) discussed in §0.1, is the relationship between activity verbs and accomplishment verbs derived from the same lexeme. Examination of these and other areas, I hope, will shed further light on the semantic nature of word formation operations, leading to a better understanding



of possible and impossible operations in this area, and the extent to which they adhere to the Monotonicity Hypothesis, and the Principle of Compositionality more generally.



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