

## Monotonicity at the lexical semantics–morphosyntax interface\*

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### 1. The Monotonicity Hypothesis

As has been observed in recent work by Levin and Rappaport Hovav (1998) and Lieber (2004), the structural side of word formation operations has been well-explored, often to the neglect of the semantic side, which is only recently receiving attention in light of advances made in lexical semantics. Work in this area, in my view, should aim to investigate what possible and impossible word formation operations are from a lexical semantic perspective, and, assuming that the semantics of word formation is not an “anything goes” type of system, explain why things are the way they are. That is, the central goal should be to explain why certain types of word formation operations are attested and why others, though conceivable, are not.

In this paper, I instantiate this program via examination of how languages encode state and change of state (COS) eventualities, as exemplified by the Quechua data in (1).

- (1) Quechua (Van Valin 2005:41, due to Weber 1989)
- a. hatun  
‘big’
  - b. hatun-ya:  
‘become big’
  - c. hatun-ya:-chi  
‘cause to become big’

The data in (1) illustrate the fact that languages often have words naming states, as in (1a), from which are derived words naming changes into those states, as in (1b). Words naming causative changes into states, at least in Quechua for certain kinds of eventualities, are in turn derived from words naming changes of state, as in (1c). In the decompositional litera-

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\*More people have contributed to my thinking on this topic than are possible to list here. On this particular paper, however, the following people have provided useful feedback: Cleo Condoravdi, Peter Sells, Beth Levin, Paul Kiparsky, Itamar Francez, and audience members at NELS 37.

ture dating at least to Lakoff (1965), words with meanings like these are often represented as in (2), with the stative meaning (2a) serving as a kind of lexical semantic primitive, and with the non-causative (2b) and causative COS (2c) meanings being built on this via addition of BECOME and CAUSE operators.

- (2) Common decompositional conceptual representations of states and changes of state
- a.  $\lambda x \lambda s [\phi(s) \wedge \text{THEME}(s,y)]$
  - b.  $\lambda x \lambda s \lambda e [\text{BECOME}(e,s) \wedge \text{THEME}(s,y) \wedge \phi(s)]$
  - c.  $\lambda x \lambda y \lambda s \lambda e [\exists v [\text{CAUSE}(v,e) \wedge \text{EFFECTOR}(v,y) \wedge \text{BECOME}(e,s) \wedge \text{THEME}(s,x) \wedge \phi(s)]]$

Data like those in (1), in turn, are commonly cited in support of decompositional theories (Foley and Van Valin 1984, Hale and Keyser 2002, Baker 2003, Van Valin 2005), with the idea being that the lexical semantic function of word formation operations like those marked by *-ya:* and *-chi* in (1) is to signal the addition of a decompositional operator like BECOME or CAUSE.

What is never seriously considered in this literature, however, is whether there exist word formation operations that *remove* operators. More specifically, the question is never raised whether there are languages with word formation operations that have the lexical semantic impact of the ones for the hypothetical Anti-Quechua in (3).

- (3) Anti-Quechua
- a.  $\llbracket \text{hatun} \rrbracket$   
 $\lambda x \lambda y \lambda s \lambda e [\exists v [\text{CAUSE}(v,e) \wedge \text{EFFECTOR}(v,y) \wedge \text{BECOME}(e,s) \wedge \text{THEME}(s,x) \wedge \text{big}(s)]]$
  - b.  $\llbracket \text{hatun-bung} \rrbracket$   
 $\lambda x \lambda s \lambda e [\text{BECOME}(e,s) \wedge \text{THEME}(s,y) \wedge \text{big}(s)]$
  - c.  $\llbracket \text{hatun-bung-bang} \rrbracket$   
 $\lambda x \lambda s [\text{big}(s) \wedge \text{THEME}(s,x)]$

By contrast with Quechua, as illustrated in (1), in the hypothetical Anti-Quechua, the lexical semantic impact of the word formation operations, rather than to add an operator like BECOME or CAUSE, is instead to remove them. As previously mentioned, whether such operations do or do not exist has, so far as I can tell, never been systematically investigated. In fact, a common operating assumption seems to be that the semantics of word formation simply does not work in this way. Instead, something like the idea in (4) seems quite commonly to be assumed, often implicitly (though see Rappaport Hovav and Levin 1998, Koontz-Garboden 2005, 2006, 2007a, 2007b, Dowty 2006 and Kuryłowicz 1964, Marchand 1964, and Kiparsky 1982 for antecedents).<sup>1</sup>

(4) **The Monotonicity Hypothesis (MH)**

Word formation operations do not remove operators from lexical semantic repre-

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<sup>1</sup>See Koontz-Garboden (2007b, Chapter 2) for detailed discussion of the formulation of the MH in (4) and possible alternatives.

sentations (= conceptual structures).

Despite its common assumption, the empirical validity of the MH has never been systematically investigated. In this paper, I survey some predictions of the MH and data bearing on it which suggest that consistent with its widespread assumption, the semantics of word formation is indeed constrained by the MH.

I focus on the domain of states and changes of state, as illustrated above, which I believe to be an ideal testing ground for the MH for two reasons. First, languages typically have words with these meanings sharing a common root (Talmy 1985, Croft 1990, Levin 2001), a fact which allows for crosslinguistic investigation of the derivational relationships among words with these meanings. Secondly, these meanings are reasonably well-understood from both a decompositional and truth conditional perspective (Dowty 1979), a fact which makes it easier to evaluate, independent of derivational morphology, whether, for example, a BECOME or a CAUSE operator is present in the lexical semantic representation of any particular word.

The MH makes a number of interesting and falsifiable predictions in this domain (Koontz-Garboden 2005, 2006, 2007a,b). In this paper, I survey data bearing on the two strongest predictions, laid out in (5).

- (5) Two strong predictions of the MH
- a. Words naming states are never derived from words naming changes of state.
  - b. Words naming non-causative changes of state are never derived from words naming causative changes of state.

Given the uncontroversial representations of states, non-causative changes of state, and causative changes of state in (2), (5a) follows from the MH since such a derivation would involve the deletion of a BECOME operator. Similarly, (5b) follows from the MH since such a derivation would entail deletion of a CAUSE operator. In the sections that follow, I examine each of these predictions in more detail, turning then to some concluding remarks.

## 2. States and changes of state

The first strong prediction of the MH in (5a) is actually more complicated. States turn out to differ semantically in ways that bear on the MH—while some states entail a prior event giving rise to the state, as with *reddened* in (6a), other states, Dixon’s (1982) *property concept states*, do not, as with *red* in (6b).

- (6) a. the **reddened** dirt (entails a prior event of reddening, result state)  
 b. the **red** dirt (does not entail a prior event of reddening, property concept)

Drawing on Davidsonian event semantics this difference can be fleshed out as in (7) and (8), treating property concept states like *red* as functions from ordinary individuals to sets of states. By contrast result states like *reddened* name functions from ordinary individuals to sets of states that are preceded by an event giving rise to the state (cf. Kratzer 2000, Koontz-Garboden 2007b, Chapter 3).

(7)  $\llbracket red \rrbracket = \lambda x \lambda s [red(s) \wedge THEME(s,x)]$

(8)  $\llbracket reddened \rrbracket = \lambda x \lambda s \exists e [BECOME(e,s) \wedge red(s) \wedge THEME(s,x)]$

In light of these differences in the representations of property concept states and result states, the MH predicts contrasting derivational behavior. Specifically, while words naming result states should be derived from words naming changes of state (via existential binding of the event operator; Kratzer 2000, Koontz-Garboden 2007b, Chapters 3,10), words naming property concept states should not. Such a derivation would necessarily involve the deletion of a BECOME operator (if not also a CAUSE operator, see Koontz-Garboden 2007b, Chapter 3 for discussion), in violation of the MH.

Precisely this contrast in derivational behavior has been observed at least since Dixon (1982)—while words naming result states are derived from verbs naming the event leading up to the result state, words naming property concept states are never derived from words naming changes into those states (Koontz-Garboden and Levin 2005; Koontz-Garboden 2005, 2007b, Chapter 3).<sup>2</sup> This is illustrated by the data in (9) and (10) from Quechua (Cusihuaman 1976, Weber 1989, Martina Faller, p.c.), Eastern Armenian (Megerdoo- mian 2002), and Pima (Jackson 2005, Smith 2006).

(9) Property concept states and changes of state

	<b>property concept</b>	<b>inchoative</b>	<b>causative</b>
Quechua	hatun ‘big’	hatun-ya ‘enlarge’	hatun-ya-chi ‘enlarge’
E. Armenian	metz ‘big’	metz-anal ‘grow’	metz-ats-nel ‘grow’
Pima	ge’e ‘big’	ge’e-da ‘enlarge’	ge’e-da-jid ‘enlarge’

(10) Result states and changes of state

	<b>causative</b>	<b>result state</b>
Quechua	qhasu ‘tear’	qhasu-sqa ‘torn’
E. Armenian	K’ot’R ‘break’	k’ot’R-atz ‘broken’
Pima	hain ‘break’	hain-s ‘broken’

Thus, while words naming result states are derived from words naming COS events, words naming property concept states are underived. In many ways, this seems quite an obvious result. Nevertheless, it would be a mysterious set of facts absent the MH.

### 3. Non-causative and causative changes of state

To the extent that non-causative COS verbs (aka, inchoatives) and causative COS verbs (aka, causatives) are derivationally related to one another, the MH leads to the prediction that causative could be derived from inchoative (i.e., (11b) from (11a)), but never vice versa

<sup>2</sup>As discussed in detail in Koontz-Garboden (2007b, Chapters 4,5) Ulwa, an endangered Misumalpan language spoken in Nicaragua, appears to be a counterexample, since it appears that words naming property concept states are derived from change of state denoting roots. As I demonstrate in Koontz-Garboden (2007b, Chapter 6), however, further investigation shows the Ulwa facts to be consistent with the MH.

(i.e., not (11a) from (11b)).<sup>3</sup>

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

This follows from the MH. While causativization would be sanctioned by the MH since it involves the addition of a CAUSE operator, anticausativization would not since it would involve the deletion of said operator. And indeed, consistent with the MH, for many pairs of verbs in many languages causative is derived from inchoative, as illustrated by the data in (12)–(14).

- (12) Quechua (Weber 1989)  
 a. hatun-ya ‘enlarge (intrans)’    b. hatun-ya-chi ‘enlarge (trans)’  
 (13) Eastern Armenian (Megerdumian 2002)  
 a. metz-anal ‘grow (inchoative)’    b. metz-ats-nel ‘grow (causative)’  
 (14) Pima (Smith 2006)  
 a. moika ‘soften (intrans)’    b. moika-jid ‘soften (trans)’

For other pairs of verbs, however, in many (and often in the same) languages, the reverse direction of derivation is, in fact, observed (Nedjalkov 1969, Croft 1990, Haspelmath 1987, 1990, 1993, Nichols et al. 2004), as illustrated by the data in (15)–(17).

- (15) Pima (Smith 2006; see also Hale and Keyser 1998 for O’odham)  
 a. hain ‘break (trans)’    b. ’e-hain ‘break (intrans)’  
 (16) Quechua (Cole 1982 in Haspelmath 1987:25)  
 a. paska- ‘open (trans)’    b. paska-ri- ‘open(intrans)’  
 (17) Spanish  
 a. romper ‘break (trans)’    b. romper se ‘break (intrans)’

For the data in (15)–(17), it appears that the inchoative is derived from the causative. Given the standard representations of causatives and inchoatives in (11), this would involve deletion of a CAUSE operator, in violation of the MH. However this might be formalized (which is not unproblematic, as discussed by Koontz-Garboden 2007b, Chapter 7), the anticausativization rule would have to do something like (18), taking a causative as an input, stripping away the CAUSE operator to return an inchoative.

- (18)  $\lambda x \lambda y \lambda s \lambda e [\exists v [CAUSE(v,e) \wedge EFFECTOR(v,y) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge \phi(s)]] \rightarrow$   
 $\lambda x \lambda s \lambda e [BECOME(e,s) \wedge THEME(s,y) \wedge \phi(s)]$

<sup>3</sup>This section draws on discussion of facts and analysis in Koontz-Garboden (2007b, Chapters 7,8), which goes into much greater detail than is possible given the constraints of this paper.

Such an analysis is assumed by many, and analyses along these lines have been explicitly proposed by Grimshaw (1982), Reinhart (2002), Härtl (2003), Reinhart and Siloni (2005) and Kallulli (2006a), among others. Such an operation, at the same time, would clearly violate the MH, since it involves the deletion of a decompositional operator.

As discussed in Koontz-Garboden (2007b, Chapter 8), however, there turn out to be a wide range of data that lead to the conclusion that the CAUSE is not deleted, but retained in the lexical semantic representation of derived inchoatives, arguing against a deletion analysis of anticausativization, and in favor of the MH. That is, although something like (11a) may be the right kind of representation for some inchoatives, it is not the right representation for *derived* inchoatives, which retain the CAUSE operator present in the representations of the causatives from which they are derived. I discuss several empirical arguments for this claim in the section that follows.

#### 4. Empirical arguments for a CAUSE in derived inchoatives

##### 4.1 The Italian *da sé*

As first noted by Chierchia (2004), the Italian *da sé* ‘by itself’ modifier, illustrated by the data in (19), distinguishes verbs with a CAUSE as part of their denotation from those lacking a CAUSE.

- (19) Gianni mi ha picchiato da sé.  
 ‘Gianni hit me by himself.’ (Chierchia 2004, 42)

The *da sé* ‘by itself’ modifier is an anaphor that gives rise to the meaning that the NP that antecedes it is the sole agent or cause of the event named by the clause in which it appears (Chierchia 2004, 42ff.), so that in (19) the idea is that the sole agent/cause of the hitting event was Gianni. Chierchia shows that *da sé* ‘by itself’ is acceptable just in case it is locally bound by a subject that can be interpreted as the sole agent/cause of the event, so, for example, the sentence in (20) is judged unacceptable because *da sé* is locally bound by the object, rather than by the subject.

- (20) \*Io ho picchiato Gianni da sé.  
 ‘I hit Gianni by himself.’ (Chierchia 2004, 42)

Similarly, as already stated above, in order for *da sé* modification to be licit, the subject binding it must be the sole agent or cause of the event named by the clause it is a subject of. Because of this, *da sé* ‘by itself’ is judged unacceptable in clauses headed by verbs that lack either agentive or causer subjects. As a consequence, stative verbs (21a,b), which lack both an agentive subject and a CAUSE operator as part of their denotation, and involuntary events such as sweating events (21c), are judged unacceptable with *da sé* ‘by itself’.<sup>4</sup>

<sup>4</sup>The data in (21) argue against the claim of Folli (2001, Chapter 2) that *da sé* ‘by itself’ adds agent/cause entailments, rather than modifying agent/cause entailments lexically specified by the verb. Were Folli’s (2001) claim correct, sentences like those in (21) would be expected to be acceptable, since the verbs

- (21) a. \* Gianni conosce il latino da sé.  
       ‘Gianni knows Latin by himself.’ (Chierchia 2004, 42)  
 b. \*è felice da sé  
       ‘... is happy by him/her/itself.’ (zero Google hits)  
 c. \* Gianni ha sudato da sé.  
       Gianni sweat by himself. (Chierchia 2004, 42)

Similarly, because the subject of a passive is not the sole causer of the event named by the verb, *da sé* ‘by itself’ is judged unacceptable with passives, even when the passive verb is indeed causative, as shown by the data in (22).

- (22) \*La porta è stata aperta da sé.  
       ‘The door was opened by itself.’

Important in the context of this paper, however, is the fact that *da sé* ‘by itself’ is, by contrast, acceptable with anticausatives, as shown by the data in (23).

- (23) Anticausatives  
 a. La porta si è aperta da sé.  
       ‘The door opened by itself.’ (Chierchia 2004, 43)  
 b. non è stata lei a forzare la serratura, si è aperta da se.  
       ‘it wasn’t you who found the lock, it opened by itself.’ (Google)  
 c. si è chiusa da se 2 volte nel giro di 10 minuti.  
       ‘... it closed by itself two times within ten minutes.’ (Google, on a software forum)

The data in (20)–(22) show that *da sé* must be bound by either an agentive or causer subject. The subjects of anticausatives like those in (23) are not agents. Nevertheless, *da sé* is acceptable with anticausatives, leading to the conclusion that the subject must in some sense be the cause of the event named by the verb. Similar facts have been observed in English (Levin and Rappaport Hovav 1995, chapter 3), German and Greek (Alexiadou et al. 2006), Slovene (Grahek 2002), and Spanish (Mendikoetxea 1999, Koontz-Garboden 2007b).

The conclusion these data lead to, then, is that the denotation of anticausatives includes a CAUSE operator, a finding which argues against the analysis of anticausativization as deletion of a CAUSE operator. Instead, anticausativization must be an operation that leaves the CAUSE as part of the lexical semantic representation of the derived inchoative. No operators are thereby deleted, and anticausativization, therefore, does not, contrary to initial appearances and previous (deletion-based) analyses, violate the MH.<sup>5</sup>

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in these sentences lack both agent and cause entailments.

<sup>5</sup>A separate question is what the right analysis of anticausativization is such that this is the case. In Koontz-Garboden (2007b, Chapter 8), I show that the range of facts, both typological and language specific, argues overwhelmingly for a reflexivization analysis of anticausativization.

## 4.2 Negation in Spanish

Another argument for a CAUSE in the representation of derived inchoatives, which has not previously appeared in the literature, comes from negation with derived inchoatives, as I illustrate in this section with data from Spanish. The observation is that negation of sentences with derived inchoatives is often ambiguous in a way that suggests that they can't name simple BECOME-type events, but must have a more highly-articulated lexical semantic representation with a CAUSE operator.

The empirical observation is illustrated by the two contexts in (24) and (25).<sup>6</sup> In the context in (24), in negating the derived inchoative, the son is denying that the glass entered into a state of brokenness.

- (24) Father: ¿Se rompió el vaso?  
 'Did the glass break?'  
 Son: No, **no se rompió** el vaso.  
 'No, the glass did not break.'  
 → **The glass did not break.**

By contrast, the same phrase in the contrasting context in (25) has a completely different meaning—in negating the derived inchoative in (25), the father is not denying that the vase entered into a state of brokenness. Instead, in (25), the father is denying that the vase was the cause of its own entering into a state of brokenness. Indeed, in the context in (25), the vase *does* enter into a state of brokenness, despite the fact that the verb naming the COS event is negated.

- (25) Father: ¿Que pasó, hijo?  
 'What happened, child?'  
 Son: El vaso se rompió.  
 'The glass broke.'  
 Father: **No se rompió** sino que tú lo rompiste!  
 'The glass didn't *break*—you broke it!'  
 → **The glass broke.**

The same state of affairs holds in the naturally occurring example in (26), where the writer does not deny that the computer was non-functional, but instead denies that the computer was the cause of its entering into a state of non-functionality.

- (26) es.charla.moteros, Nov. 4, 2003, posted by "Wanchuzri"  
 > menos mal que la wanchu no puede leer esto ...  
 'less bad that Wanchu(zri) can't read this ...'  
 > el otro día se le rompió el ordenador ...:-/  
 'the other day her computer broke on her ...'  
 Oye, niñato, que ya si te leo y el ordenador **no se rompió** sino que me lo rompiste

<sup>6</sup>Cf. data from English discussed by (Wierzbicka 1980, 172).

TU!

‘Listen, Niñato, now I do read your message, and the computer didn’t *break*, but rather you broke it on me!’

→ **The computer broke.**

What is going on with sentences such as (24), on the one hand, and those in (25) and (26) on the other, is that there are two very different interpretations of derived inchoatives under negation—one in which it is denied that a COS event was undergone, and another in which something else is denied, namely that the undergoer of the change into the state was also the cause of the COS event.<sup>7</sup> On this second interpretation, crucially, it is not denied that a COS event was undergone; indeed, a COS event *can* have been undergone, as made explicit by the data in (25) and (26).<sup>8</sup>

The contrast between the two interpretations can be seen more clearly by considering the formal representation assigned to sentences with derived inchoatives like (25) and (26) on the reflexivization analysis of anticausativization developed in Koontz-Garboden (2007b, Chapter 8). This is laid out in (27).

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<sup>7</sup>In addition to the somewhat marked contexts laid out in (25) and (26), more neutral contexts can also be found in which the same kind of observation can be made, with the same consequences for the nature of the lexical semantic representation of derived inchoatives. This is illustrated by the data in (i) and (ii). In the absence of any intonational marking, the most natural interpretation of (i) is one in which it is denied that the glass underwent a change into a state of brokenness.

- (i) **No se rompió** el vaso.  
 ‘The glass did not break.’  
 →**The glass did not break.**

This contrasts with the most natural interpretation for (ii), in which it is not denied that the glass broke—on the contrary, the glass *did* break, but it is denied that the glass was the cause of the change into the state.

- (ii) **No se rompió** el vaso por sí solo.  
 ‘The glass did not break by itself.’  
 →**The glass broke.**

Crucially, as shown in Koontz-Garboden (2007b, Chapter 8), Spanish *por sí solo* ‘by itself’ (and the Italian counterpart *da sé* ‘by itself’) is not responsible for adding causative semantics to the sentence. Instead, these must come from the meaning of the derived inchoative.

<sup>8</sup>Precisely the same behavior is observed in Italian, as illustrated by the naturally occurring data in (i) (due to Beth Levin).

- (i) la diatriba l’hai aperta tu, non si e aperta sola, attaccando per un tuo infantile capriccio chi non aveva rivolto nemmeno un piccolo accenno alla tua Peloro Truffa  
 you opened (started) the diatribe; it didn’t start by itself ...  
[http://www.ngmail.it/forum.nsf/\(\\$Messaggi\)/F619A60E976C1C8DC125713F003E3BF0?OpenDocument](http://www.ngmail.it/forum.nsf/($Messaggi)/F619A60E976C1C8DC125713F003E3BF0?OpenDocument)

Again, the observation is that despite the fact that the derived inchoative *si e aperta* is negated in (i), it is not denied that the diatribe began. What is denied is instead that the diatribe began on its own, the claim being instead, that somebody else started it.

$$(27) \quad \neg \exists v \exists s \exists e [ \text{CAUSE}(v,e) \wedge \text{EFFECTOR}(v,x) \wedge \text{BECOME}(e,s) \\ \wedge \text{THEME}(s,x) \wedge \text{not-whole}(s) ] ]$$

What (27) says is that there does not exist an eventuality  $v$  that caused a change event  $e$  into a state  $s$  in which  $x$  was both the undergoer of the change event and the effector participant in the causing eventuality  $v$ .<sup>9</sup> Now, consider the kinds of situations that satisfy this logical representation. First, note that (27) is consistent with a situation in which there exists no COS event  $e$  or stative eventuality  $s$ , since if these do not exist there can exist no eventuality  $v$  that caused the change  $e$  into the state  $s$ , since these do not exist. Additionally, however, (27) is also consistent with a situation in which there *does* exist a change  $e$  into a specified state  $s$ . More specifically, (27) would be satisfied by a situation in which the change  $e$  into the state  $s$  exists, but in which there exists no eventuality  $v$  with an EFFECTOR participant  $x$  that is also the THEME of the change  $e$ . This is precisely what happens in (26).

The important point in the context of the MH is that a theory on which derived inchoatives lack a CAUSE operator cannot capture these facts, since negation of a derived inchoative will always entail the non-existence of the specified COS event. To see this more clearly, consider the representation of the same negated sentences with derived inchoatives on a theory in which the CAUSE is absent from the lexical representation of the derived inchoative. Such a representation is given in (28).

$$(28) \quad \neg \exists e \exists s [ \text{BECOME}(e,s) \wedge \text{THEME}(s,x) \wedge \text{not-whole}(s) ] ]$$

The representation in (28) will be satisfied only in a situation in which there does not exist a change event  $e$  into a state  $s$ . But, as shown by the data in (25) and (26), this is not universally the case for sentences with negated derived inchoatives—in certain environments, sentences with negated derived inchoatives can be used when some entity has indeed undergone a COS event. In this way, then, any analysis that has it that the representation of derived inchoatives lacks a CAUSE operator cannot capture facts like those in (25) and (26). By contrast, if there is indeed a CAUSE as part of the representation of derived inchoatives, as independently predicted by the MH, these facts are not surprising.

### 4.3 Additional arguments

In addition to the the arguments from *da sé* ‘by itself’ and from negation in Spanish, there are additional arguments supporting the existence of a CAUSE in the lexical semantic representation of derived which are discussed in detail in Koontz-Garboden (2007b, Chapter 8). First, certain adverbs like the Italian *violentemente* ‘violently’ seem to require the presence of a CAUSE in the lexical semantic representation of the verbs that they modify (Centineo 1995). Similar observations have been made for certain adverbial modifiers in Greek (Alexiadou and Anagnostopoulou 2004, 131) and Spanish (Mendikoetxea 1999). Another argument comes from obliques that overtly specify the participant in the causing subevent of a verb’s lexical semantic representation. In Greek, while intransitives with a covert CAUSE can take such an oblique, this is not true for intransitive verbs lacking a

<sup>9</sup>The notion of EFFECTOR I have in mind is that of Van Valin and Wilkins (1996).

CAUSE (Alexiadou et al. 2006, Koontz-Garboden 2007b). Another argument comes from what in Albanian and other languages has been called the “feel like” construction (Kallulli 2006a,b,c, Marušič and Žaucer 2005). Kallulli (2006a,b,c) shows that this construction has an “unintentional cause” reading only with intransitive verbs that have a covert CAUSE operator, among them derived inchoatives. Ultimately these diagnostics, in addition to the ones discussed above, all support the claim that there is a CAUSE in the lexical semantic representation of derived inchoatives, a finding consistent with the predictions of the MH.

## 5. Concluding remarks

The point of departure for the preceding discussion was the question of what, from a lexical semantic perspective, word formation operations do, do not do, and why. I asserted the Monotonicity Hypothesis, as laid out in (29), as one constraint.

(29) **The Monotonicity Hypothesis (MH)**

Word formation operations do not remove operators from lexical semantic representations.

I went on to investigate the derivational relationship of words naming states to words naming changes of state to determine the extent to which the predictions of the MH are borne out, at least in that empirical domain. The data surveyed suggest that word formation operations are indeed constrained by the MH in that the two strong predictions of the MH are borne out. Specifically, I showed that words naming property concept states are never derived from words naming changes of state and that anticausative derivations, although they are widely attested, do not delete a CAUSE operator.

The MH makes many more predictions about direction of derivation, not only within the domain of states and changes of state but beyond (Koontz-Garboden 2007b, Chapter 9). In light of the common assumption across a wide range of theories of the MH, it seems important that additional crosslinguistic work be undertaken to examine these predictions. Additionally, further work is needed to clarify the formal nature of the MH. It seems likely that it needn't be separately stipulated, but that it follows from higher-level principles of grammar, for example from the Principle of Compositionality (see Dowty 2006 and Koontz-Garboden 2007b, Chapters 2,10 for relevant preliminary discussion) or from Chomsky's (2005) “no-tampering” condition, on a non-lexicalist theory of syntax .

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