

THE CAUSATIVE-INCHOATIVE ALTERNATION: A CASE STUDY IN PARALLEL MORPHOLOGY

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1. THE MORPHOLOGY SYNTAX INTERFACE*

The question of the morphology/syntax interface, an important linguistic battleground in the '60s and early '70s, but inert in the following decade, has emerged with renewed force in the last couple of years. Work done on the lexicon during the '70s and the '80s has resulted in important structural insights into the nature of word formation, thus strengthening the claim that morphology is an autonomous module. On the other hand, work done in syntax during that same period resulted in the emergence of syntactic systems capable of handling word formation operations in a fairly restricted way, thereby suggesting the possible reduction of word formation operations to syntactic ones.

It is within this enhanced understanding of both syntax and word formation that the same question is now raised again: is morphology an independent module, subject to restrictions all its own, or should it be subsumed under syntax, obeying syntactic restrictions which are independently motivated?

For those who believe in the existence of an independent word formation component, another question must be resolved: how is the interaction between such an independent word formation component and the syntax to be characterized?

The bottom line is that the resolution of these questions is an empirical issue. Proponents of an independent word formation component must show that such a component includes operations and constraints which cannot be reduced to independently motivated syntactic conditions. They must further show that an independent word formation component with its accompanying restrictions allows for a range of phenomena that cannot otherwise be accounted for. Proponents of exclusively syntactic word formation, on the

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other hand, must do the opposite: they must provide a way of accounting for the richness of WF phenomena, without appealing to any syntactic processes which are not otherwise motivated. If in order to allow word formation in the syntax one has to introduce formal machinery which is not syntactically attested otherwise, this would not represent any simplification of the grammar. It would simply allow a modified specialized syntax for generating words, differing in crucial, principled ways from that needed for generating phrases. In what follows I will briefly schematize the dominant "lexical" approach and compare it to the dominant "syntactic" approach. I will then proceed to show that empirical and formal considerations force us to reject an exclusively syntactic approach. While morphology will emerge as an autonomous module in a formally well-defined sense, the dominant "lexical" approach, which I will refer to as the "linear" approach, will be shown to be empirically inadequate.

1.1. Linear models

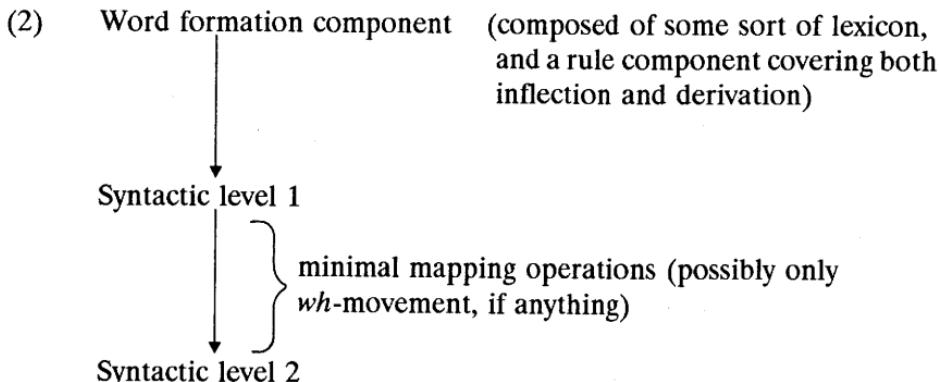
Much of the work on word formation in the '70s and the early '80s has been informed by the assumption that not only is there an independent word formation component, but its interaction with the syntax is severely limited by some version of Lapointe's (1979) Lexical Integrity Hypothesis (LIH). A recent version of this principle, the Atomicity Thesis of Di Sciullo & Williams (1987) is given in (1):

(1) *The Atomicity Thesis*

Words are "atomic" at the level of phrasal syntax and phrasal semantics. The words have "features", or properties, but these features have no structure, and the relation of these features to the internal composition of the word cannot be relevant in syntax.

The way in which LIH is implemented in many of these models is by assuming that the WF component, as a block of rules, is ordered prior to D-structure, that is, prior to the availability of any syntactic operations. The WF component and the syntax thus interact only at one fixed point: the output of the former is the input to the latter. This notion of the autonomy of the syntax and the WF component, and the restricted interaction between them, thus mimics the notion of *autonomy* developed for the interaction between the syntax and the phonology, where it is the output of the former which interacts with the latter.

I will refer to this class of models as linear models, and, taking the risk of great oversimplification, will schematize them as in (2):



1.2. Syntactic models

In contrast with the linear models, in recent years, much work (notably, work inspired by Baker 1985 and Pollock 1989) can be characterized as an attempt to deny (much of) WF its status as an independent module.¹ The thrust of much of the argumentation in these works seeks to show that WF phenomena adhere to syntactic constraints, and interact with syntactic rules, and hence are best characterized as syntactic phenomena, and not WF-specific phenomena. To concentrate here on studies modifying argument structure, this work typically spans constructions such as passives and causatives, reflexives, benefactive incorporation, noun incorporation, etc.

Syntactically speaking, much of this work utilizes head-to-head movement, first proposed in Travis (1984); Head-to-head movement is the possibility of moving an Y^0 projection by Move α and adjoining it to a governing X^0 , thereby creating the adjunction structure in (3). Head-to-head movement is then restricted by the Head Movement Constraint, presumably reducible to the ECP.

(3)



The availability of a syntactic operation which creates such X^0 projections under well-defined syntactic conditions thus sets the stage for proposing

¹ M. Baker, in personal communication and in print, has distanced himself from more radical executions of his research program, negating (or seeking to negate) the independent existence of morphology. There is no doubt, however, that his original work has been extremely influential in forming this tendency.

syntactically formed words. The force of the argument here is a *formal* one: if syntactic operations may form morphological structures, then the argument for an autonomous morphology is considerably weakened. One might note, however, that while the availability of such a syntactic operation allows the formation of X^0 projections in the syntax, it does not actually force the formation of *words* in the syntax, unless it is actually assumed that by *definition*, all such adjunction-created X^0 projections are *words* in the morphological sense; that is, if it is already assumed that morphological structures and syntactic structures are identical. It is in fact entirely compatible with existing syntactic assumptions to claim that the structures generated by head-to-head movement are *not* words in the morphological sense, but rather, non-maximal phrases with some well-defined range of syntactic (rather than morphological) properties.

So let us turn now to a comparison of morphological structures and syntactic structures, asking whether they are the same. Specifically, let us ask whether the notion of *head*, and consequently, *selection*, are unified notions, or put differently, are morphological hierarchical structures identical to syntactic hierarchical structures.

It appears to me that the presumption of identity of morphological and syntactic structures is largely based on a terminological confusion. From the late '70s onwards, work on WF typically utilizes notions such as *head*, *subcategorization*, and *re-write rules*, all terms clearly suggesting a syntax-like structure. But are morphological structures the same as syntactic ones? Let us briefly consider some of these alluded parallelisms.

1.2.1. Headedness and hierarchical structures in morphology

As a review of the re-write schemata and hierarchical structures proposed for morphology will reveal immediately, these are systematically incompatible with notions of phrase structure and tree structure proposed for syntax. Considering, specifically, proposals made in Selkirk (1982), note that her re-write schemata cannot be reduced to a categorial projection from the lexicon, as is customarily assumed for syntax. Second, there is no way to reduce it to X^1 -theory. On the contrary, Selkirk proposes rules such as WORD → STEM; STEM → ROOT, etc., to represent cyclical domains for the application of morphological and phonological rules. In no way do these rules give rise to maximal or non-maximal projections in the syntactic sense.

Heads and maximal projections of sorts are explicitly proposed for morphological structures by Williams (1981a). Specifically, it is proposed that the rightmost element in a morphological string determines the categorial type of the projection dominating it. Putting aside the question

of the empirical adequacy of the Righthand Head Rule, note that this is very different from the notion of head in syntax: it is relativized to a structure (and claimed to be a universal). The head, rather than being a primitive defined as X^0 , as it is in syntax, is identified by its position. To illustrate the contrast with syntactic practices, consider a strict head-final language, which allows in some context a non-verbal category Y to appear at the right periphery of the VP. It is rather unlikely that because of its rightmost position, it will be considered the head of the VP which dominates it.

Finally, Lieber (1980), rather than defining heads and projections as such, defines a set of percolation relations in morphological binary-branching structures. At times these are relations between affixes and the binary structure which dominates them. Affixes in her system are a derivative, rather than a primitive notion: it is the element that has a subcategorization frame. For compounds, on the other hand, percolation is directionally determined. Either way, none of these notions is equivalent to the notions of head and maximal projection as they are used syntactically.

Furthermore, Lieber (1980) explicitly allows percolation from "complements" in a well-defined set of cases. Di Sciullo & Williams (1987) account for a similar class of cases by assuming that morphological objects may be multi-headed. While the ability of morphological structures to inherit properties both from their "dominant" constituent and from its "complement" seems well-established, it appears dubious that such configurations are syntactically attested.²

2 In this context, an interesting case is presented by cases in which, it has been argued, an external θ-role is compositionally assigned by a verb in combination with its complement. The following cases, fashioned after argumentation in Marantz (1984), illustrate such cases. Whereas in (i) plausibly the external θ-role is assigned by the verb *kill*, in (ii) it appears to be assigned by the combinations *kill the conversation* and *kill the bottle*, respectively:

- (i) John killed the frog.
- (ii)
 - a. John killed the conversation.
 - b. John killed the bottle.

So in these cases it might be argued that secondary percolation applies in the syntax, contrary to the suggestion made here.

Viewed from a different perspective, however, the data in (ii) supports precisely the claim that secondary percolation is a core process of word-formation, but is allowed, if at all, only peripherally in the syntax. The expressions in (ii) are clearly idiomatic in nature, and as such, contrast with (i). Typically, they do not passivize without losing their "compositional" sense, nor can the object be moved by *wh*-movement:

- (iii)
 - a. *The conversation was killed by John.
 - b. *The bottle was killed by John.
- (iv)
 - a. *What sort of conversation did John kill?
 - b. *Which bottle of Brandy did John kill?

To summarize, an attempt to assimilate any of the above proposals to a syntactic structure would require extensive modification of our notion of syntactic hierarchical structures, based entirely on the unique properties of word formation.

1.2.2. Subcategorization

Lieber (1980) and others have proposed that morphological selection can be captured by means of morphological subcategorization. This subcategorization as well is entirely distinct from that proposed for syntax. In order to illustrate this, consider a recent proposal by Rizzi & Roberts (1989). They propose that morphological subcategorizations are projected syntactically as adjunction structures with an empty slot into which substitution movement can move heads, but head-to-head movement is possible *without* such base-generated adjunction structure as well, *creating* adjunctions, rather than substituting into base-generated ones.

It might be worthwhile to consider some of the consequences of this proposal. First, note that it allows head-to-head movement, and hence the formation of an X^0 projection, which is not a word, when no morphological subcategorization was projected. Thereby, the definition of *word* is lifted out of the syntax, becoming a purely morphological matter. This is especially striking, as syntactically, the outputs of substitution into an adjunction structure and adjunction-creating movement are identical. The syntax is thus in principle incapable of distinguishing between these two outputs, and an (independent) morphology must be appealed to, to determine which syntactic configurations correspond to words and which do not.

Second, since the outputs of substitution and of adjunction are identical, a configuration is introduced here which is otherwise unattested in syntax, and seems needed only for the purposes of incorporating word formation into the syntax.

In Roberts (1991), it is proposed that in substitution cases (but not in adjunction cases) a sub- X^0 structure is base-generated, $[X^0 _ Y X^{0-1}]$, and that substitution is to an empty Y -slot in this structure. In this way, the structural identity between the outputs of adjunction and substitution is avoided. Note, however, that it is achieved at the cost of introducing a sub- X^0 structure for the manifest purpose of allowing words to have syntactic

Thus the output of the "secondary percolation" in (ii) behaves more like a word than like a phrase, suggesting that idioms are best characterized as the application of a WF-like operation in the syntax. Note that the percolation of clear, unambiguous syntactic properties, such as categorial features, is never attested. (Note that this does not imply that in (i) the θ -role is directly assigned by the verb. Rather, it may be assigned by the VP or the V' projection via primary percolation).

structures. Nothing but morphological structures would ever have sub-X⁰ structure, nor would morphological selection ever be realized anywhere else. Thus the syntactic difficulty here is solved by reinforcing the gap between syntactic selection and morphological selection, not eliminating it.

Third, given the fact that the morphological subcategorization is projected syntactically and the existence of a base-generated structure in which it may be satisfied, one may ask what prevents the base-generation of these morphological structures with all morphemes in place, preempting movement altogether. The answer is, of course, that such base-generation is not possible as the incorporated element must satisfy a distinct syntactic subcategorization frame at D-structure in order to be compatible with the Uniformity of Theta Assignment Hypothesis (UTAH) of Baker (1985). It thus seems that morphological subcategorization frames *may not* be satisfied at D-structure. In fact, it is precisely the conflict between the syntactic subcategorization, which must be satisfied at D-structure, as per UTAH, and the morphological subcategorization which may not be thus satisfied, which gives rise to the movement. It is thus obvious that syntactic subcategorization and morphological subcategorization are vastly distinct, and that there is no reason to assume that they project syntactically in a similar fashion.³

3 A reviewer suggests that the best way to characterize the pre-movement vs. post-movement structures in the context of the Rizzi & Roberts proposal is as a distinction between adjuncts (created by movement) and specifiers (base-generated). While this might be an interesting way to proceed, note that such an extension has two ramifications. First, it obliterates the representational distinction between specifiers and adjuncts, requiring the distinction to make a crucial reference to the history of the derivation. Second, it requires the assumption that morphological subcategorization is met in the specifier position, again in contrast with syntactic subcategorization, which is always met at the complement level. Alternatively, it might be assumed that the relevant position is syntactically a specifier, but morphologically a complement. Either way, it is clear that any of these interpretations still maintains a clear distinction between the satisfaction of morphological selection and that of syntactic selection.

Assuming UTAH and the essential correctness of Rizzi & Roberts analysis, the reviewer further argues that morphological and syntactic subcategorization could be both satisfied at D-structure if the incorporated head is base-generated in its S-structure position, binding a trace in the head position of some maximal projection already in the base. Such a proposal, however, is hard to reconcile with the most fundamental insight of the UTAH approach: that thematic relations must be realized in an identical fashion at D-structure, assuming strictly that D-structure is GF-θ. If the satisfaction of GF-θ at D-structure were to be accomplished through traces as well as through base-generated elements, then the strongest motivation for the existence of D-structure as a level of GF-θ would disappear, and enriched S-structures representations could be projected in its stead. However, in a system that replaces D-structure as GF-θ with an enriched S-structure representations, it is altogether unclear what the status is of statements which crucially appeal to a distinction between D-structure and S-structure in terms of GF-θ. The reviewer's perspective, while independently interesting, is inherently inconsistent with the thrust of both Baker (1988) and Rizzi & Roberts (1989). I return to this point briefly in footnote 11 below.

Thus extending the syntax to cover morphological structures requires a radical modification of our notion of hierarchical structures and selection. Notions such as head and selection, when used morphologically, are sufficiently distinct to seriously shake any attempt to reduce them to well-known syntactic mechanisms.

I thus conclude that the evidence that morphological structures are the same as syntactic structures, or that syntactic operations derive morphological structures, is non-existent. At best, the syntax may create the environment for the application of a morphological rule.

1.3. Syntactic models and the Universal Alignment Hypothesis

What, then, supports the claim that, e.g., noun incorporation as a *morphological process* is syntactically derived? Baker brings forth many empirical arguments for his assumption that noun incorporation must be syntactically derived. However, subsequent work by Di Sciullo & Williams (1987) has shown that none of his empirical arguments actually *excludes* a lexical derivation. His arguments merely show that a syntactic derivation is *consistent* with the observed facts.

Rather, the main justification for assuming that the X^0 structure in (3) is a *word* in the *morphological sense* and must be allowed to be formed by syntactic movement does not come from purely syntactic considerations at all, but from a very powerful pre-theoretical approach to the interaction between lexical semantics and syntax. In this view, closely resembling the Generative Semantics tradition, there should be a direct mapping between thematic roles and syntactic structures, and insofar as such a direct mapping could be established, it would perforce favor those formal representations which are compatible with it and exclude the others. For proponents of such an approach it thus suffices that syntactic word formation be shown to be empirically adequate. It is not necessary to show that the rivaling approach, the lexical one, is empirically flawed, since, everything else being equal, it is to be dismissed on general, pre-theoretical grounds. In (4), I give a version of this pre-theoretical assumption, known as UAH (all objections to UAH mentioned later on apply to UTAH as well):

(4) *The Universal Alignment Hypothesis*

Principles of UG predict the initial relation borne by each argument in a given clause from the meaning of the clause (Perlmutter & Postal 1984; Pesetsky 1988, 1990; among others).

It is thus clear that while head-to-head movement makes syntactic word formation technically possible, it is only a principle such as UAH which

makes it obligatory in some contexts. In a model that incorporates the UAH, even if there is a (residual) word formation component, operations such as causative formation, passive formation, noun incorporation, must be syntactic. It follows that if it can be shown that there are morphological operations which involve argument structure modification, and which cannot be syntactically derived, then the UAH may not be maintained. Before I turn to a detailed study of such a case, it is worthwhile to note that there is already in the literature a glaring counterexample to the UAH: that presented by the contrast between adjectival passive and verbal passive. It is quite well known (see Burzio 1986; Pesetsky 1982; Levin & Rappaport 1986; Borer & Grodzinsky 1986) that while adjectival passives select an external argument (at D-structure), verbal passives select an internal argument (at D-structure). However, it is clear that the thematic role associated with that argument is one and the same, thus presenting a *prima facie* problem for the UAH. I will turn, however, to the consideration of another case: that of the causative-inchoative alternation. I intend to show that there is an independent WF component that cannot be reduced to the syntax, and that the UAH may not be maintained. On the other hand, I will also demonstrate that linear models of autonomous morphology are untenable. I will thus promote a notion of autonomous morphology which I will refer to as *Parallel Morphology*, which is distinct from and incompatible with linear models.

Inherent to this project is the assumption that there is no strict mapping from lexical semantics to the syntax. However, it is my view that the absence of such direct mapping does not lead to a loss of restrictiveness. On the contrary: I believe that it is precisely the attempt to create such a direct mapping which has led to the postulation of unmotivated syntactic and semantic distinctions, resulting in the proliferation of powerful formal devices. While the ways in which lexical semantics determines syntactic structures must be studied, one of the aims of this paper is to argue that pursuing a direct mapping between them is conceptually problematic and empirically wrong.

As a note before proceeding: while I have reviewed here two opposing views of morphology, this is not to say that there are no other views which cannot be thus characterized, and which are reminiscent of the system that I am proposing here in allowing for a more complex notion of the interaction between syntax and word formation. None of these, unfortunately, has been as influential as the previously mentioned approaches, although in my opinion they are all, in one way or another, on the right track. Among these especially important views are works by Marantz (1984), by Sadock (1985), by Emonds (1985) and by Walinska de Hackbeil (1986).

2. THE INCHOATIVE-CAUSATIVE ALTERNATION: THE PHENOMENA

If the UAH is correct, it makes extremely strong predictions concerning pairs such as *angry-anger*, *worry-worried*, etc. As the thematic role associated with the subject of *angry* is clearly identical to that associated with the object of *anger*, proponents of the UAH (and I have in mind here especially Pesetsky 1988, 1990) must argue that the structures associated with these pairs are essentially as in (6)-(7).⁴

- (6) Mary was angry.

- (7) a. Bill angered Mary.
 b. Bill [VP CAUSE [AP Mary angry]]
 c. Bill [VP CAUSE+angry_i [AP Mary *t_i*]]

Pesetsky himself, however, observes that the properties of the adjective in (6) differ from those of the (embedded) adjective in (7), and hence the contrast between (8a) and (8b):

- (8) a. Mary was angry at the results.
 b. *John angered Mary at the results.

In order to explain the ungrammaticality of (8b) Pesetsky (1988) appeals to The Unaffectedness Condition, essentially forbidding an inherent Case assigner to move away from its arguments. As I will show shortly, however, the ungrammaticality of (8b) represents only a part of the picture. In truth, it appears that the putative underlying AP in (7) has none of the properties expected from an AP.

As a first step, consider the structure in (7). Note now that the verb *anger* exhibits none of the distributional properties of the underlying adjective. Thus consider the following contrast:

- (9) a. John is angry as a bull.
 b. Bill made John angry as a bull.
 c. *Bill angered John as a bull.

⁴ The structures in (6)-(7) are different from those actually proposed by Pesetsky in a number of aspects immaterial to the discussion here. Structures were simplified where possible to focus on the issue at hand.

- (10) a. John is more angry than Mary/angry more than Mary.
 b. Bill made John more angry than Mary/angry more than Mary.
 c. *Bill angered John more than Mary.
 (under the intended reading where Bill made John more angry
 than Mary was angry)

The paradigm illustrated by (9)–(10) is by no means an isolated case. Thus consider the identical behavior of verbs derived from adjectives with the suffix *-ize*, illustrated in (11)–(13):

- (11) a. The income tax is popular like the sales tax.
 b. The income tax is more popular than the sales tax.
 c. This student is radical like me.
 d. This student is more radical than me.
- (12) a. *The senator popularized the income tax like the sales tax.
 b. *The senator popularized the income tax more than the sales tax.
 c. *The revolution radicalized this student like me.
 d. *The revolution radicalized this student more than me.⁵
- (13) a. The senator made the income tax popular like the sales tax.
 b. The senator made the income tax more popular than the sales tax.
 c. The revolution made that student radical like me.
 d. The revolution made that student more radical than me.

The complete absence of the properties of the source adjective in the derived verbal structure strongly suggests that the S-structure representation of (7) does not contain an AP, and it is for this reason that not only the arguments of *angry* cannot surface, but none of the other properties of the source APs can be realized. Such a conclusion thus considerably weakens the claim that syntactic head-to-head movement is responsible for the derivation of (7a). It turns out, however, that the paradigm in (8)–(13) represents a very incomplete picture.

In order to proceed, let us consider some other cases where a morphological relatedness between adjectives and verbs is well established, turning now to Hebrew. Observe first that in the paradigms in (14), the *hiCCiC*

⁵ Note again that the excluded reading is that the revolution radicalized the student so that he became more radical than me, not a reading in which both the student and I are undergoing radicalization.

verbal pattern exhibits regular derivational morphological and semantic relations with adjectives:⁶

(14) <i>Adjective</i>	<i>Verb</i>
laban	hilbin 'white-whiten'
'adom	he'edim 'red-redden'
Saxor	hiSxir 'black-blacken'
zaqen	hizqin 'old-"make old"
Samen	hiSmin 'fat-fatten'
raxab	hirxib 'wide-widen'
9aSir	he9eSir 'rich-enrich'

Although in these cases the adjectival source is morphologically undisputable, note that nevertheless they pattern like (9)–(10) and (12):

- (15) a. Ha-simla hayta lebana (kmo gir).
the-dress was white as chalk
- b. Ha-nasi haya 9aSir (kmo qorax).
the-president was rich as Qorax (=Creusus)
- c. Ha-xatula hayta Smena (kmo xazir).
the-cat was fat as pig

- (16) a. Ha-kbisa hilbina 'et ha-simla (*kmo gir).
the-wash whiten ACC the-dress as chalk
- b. Ha-9isqa he9eSira 'et ha-nasi (* kmo qorax).
the-deal enriched ACC the-president as Qorax
- c. Ha-zriqa hiSmina 'et ha-xatula (*kmo xazir).
the-shot fattened ACC the-cat as pig

- (17) a. Ha-simla hayta lebana (yoter me-gir).
the-dress was white more than-chalk
- b. Ha-nasi haya 9aSir (yoter me-qorax).
the-president was rich more than-Qorax
- c. Ha-xatula hayta Smena (yoter me-xazir).
the-cat was fat more than-pig

6 In the pattern marked here as *hiCCiC* (traditionally called the *hipgil* pattern), the capitalized Cs stand for the consonants of the root, while the lower case characters stand for the fixed prefix-vocalic pattern associated with this pattern. The form is in the past, inflected as singular masculine, as is common in traditional studies of Semitic morphology. Here, as elsewhere, Modern Hebrew pronunciation is informally represented. No phonological statement is intended.

- (18) a. Ha-kbisa hilbina 'et ha-simla (*yoter me-gir).
 the-wash whiten ACC the-dress more than-chalk
 b. Ha-9isqa he9eSira 'et ha-nasi (*yoter me-qorax).
 the-deal enriched ACC the-president more than-Qorax
 c. Ha-zriqa hiSmina 'et ha-xatula (*yoter me-xazir).
 the-shot fattened ACC the-cat more than-pig

It appears, then, that in itself, the absence in (9)–(10) and (12) of AP properties cannot show that, e.g., *anger* is not derived from an adjective. However, for *anger* as well as for the forms in (12), (16), and (18) it suggests that the A has been rendered somehow syntactically opaque.

But now let us turn to another paradigm, contrasting directly with that in (15)–(18). The *hiCCiC* forms in (14) also have an inchoative reading, and when this reading is realized, they are intransitive. Surprisingly enough, in these cases adjectival properties are attested. Note that this is true even when the putative cause is expressed as an adjunct clause:

- (19) a. Ha-simla hilbina kmo gir (ketoca'a me-ha-kbisa).
 the-dress whitened as chalk (as-a-result of the wash)
 b. Ha-nasi he9eSir kmo qorax (ketoca'a me-ha-9isqa).
 the-president became-rich as Qorax (as-a-result of the deal)
 c. Ha-xatula hiSmina kmo xazir (ketoca'a me-ha-zriqa).
 the-cat fattened as pig (as a-result-of the shot)
- (20) a. Ha-simla hilbina yoter me -gir (ketoca'a me-ha-kbisa).
 the-dress whitened more than chalk (as-a-result of the wash)
 b. Ha-nasi he9eSir yoter me-qorax (ketoca'a me-ha-9isqa).
 the-president became-rich more than Qorax (as-a-result of the deal)
 c. Ha-xatula hiSmina yoter me-xazir (ketoca'a me-ha-zriqa).
 the-cat fattened more than pig (as a-result-of the shot)

Just as (10), (16), (18) demonstrated that there is no underlying AP in the causative forms, (19)–(20) demonstrate with equal force that in the inchoative forms, such an underlying AP does exist.

An even stronger case for its existence can be made with the use of adjectival superlative modifiers which are never independently attested in the verbal system, such as *haki* (*A*) *Se'epSar*, 'as *A* as possible', and *haki* 'most', on the one hand, and *lehapli* 'wonderously':^{7,8}

⁷ Modification of a verb by these expressions necessitates the insertion of a quantifier, somewhat on a par with English:

- (21) a. Ha-sadin Seli haki laban Se'epSar.
 the-sheet mine most white that-possible
 ‘My sheet is as white as possible.’
- b. Ha-sadin Seli hilbin haki Se'epSar.
 the-sheet mine whitened most that-possible
 ‘My sheet whitened as (much) as possible.’
- (22) a. Mikol ha-tanurim, Seli haki Saxon.
 of all the-ovens mine most black
 ‘Of all the ovens, mine is the blackest.’
- b. Mikol ha-tanurim Seli haki hiSxir.
 of all the-ovens mine most blackened
 ‘Of all the ovens, mine blackened the most.’
- (23) a. Ha-sadin Seli laban lehapli.
 the-sheet mine white wonderously
 ‘My sheet is unbelievably white.’
- b. Ha-sadin Seli hilbin lehapli.
 the-sheet mine whitened wonderously
 ‘My sheet became unbelievably white.’

Similar modification with causative *hiCCiC* derivations, however, leads to ungrammaticality:

- (i) Ran haras haki harbe/me9at Se-'epSar.
 Ran destroyed most much/little that-possible
 ‘Ran destroyed as much as possible.’
- (ii) Ran 'akal haki harbe/me9at.
 Ran ate most much/little
 ‘Ran ate the most/the least.’

8 While the word order in (21) is the unmarked order, arguments for head-to-head movement of the adjective to the *hiCCiC* form based solely on the position of *haki* in (21a) and (21b) respectively are weakened by the fact that (i) and (ii) are possible—if more marked—word orders as well:

- (i) Ha-sadin Seli laban haki Se'epSar.
 the sheet mine white most that-possible
- (ii) Ha-sadin Seli haki hilbin Se'epSar.
 the-sheet mine most whitened that-possible

While I do believe that head-to-head movement is involved in the derivation of (some) inchoatives (see below), the placement of modifiers is obscured by factors such as modifier cliticization and by the fact that V-raising may exist in Modern Hebrew alongside I-lowering (see Borer 1991 for discussion).

- (24) a. *Ha-ekonomika hilbina 'et ha-sadin haki Se'epSar.
 the-bleach whitened ACC the-sheet most that-possible
 b. *Mikol ha-tanurim ha-srepa haki hiSxira 'et Seli.
 of-all the-ovens the-fire most blackened ACC mine
 c. *Ha-ekonomika hilbina 'et ha-sadin lehapli.
 the-bleach whitened ACC the-sheet wondrously

The Hebrew cases by no means represent an isolated paradigm. The English suffix *-en* exhibits precisely the same properties: like the Hebrew case, this suffix fulfills the dual role of causative and inchoative, and in each of these behaviors, it patterns like its Hebrew correlate. Thus consider (25)–(26), which behave exactly like inchoative (19)–(20), and compare them to (27), which patterns with the causative (10), (12), (16), (18):⁹

- (25) a. The sky darkened like coal (before the storm).
 b. The canal widened like a river (after the flood).
 c. The dress whitened like snow (as a result of the wash).
- (26) a. The sky darkened more than coal (before the storm).
 b. The canal widened more than a river (after the flood).
 c. The dress whitened more than snow (as a result of the wash).¹⁰
- (27) a. *The storm darkened the sky like/more than coal.
 b. *The flood widened the canal like/more than a river.
 c. *The bleach whitened the dress like/more than snow.

It now appears that there is strong evidence for the presence of a syntactic AP in (19)–(26). In fact, the paradigm illustrated can hardly be explained if such an AP is not assumed. We are now faced with what appears at first as a contradictory situation: can it be that in the inchoative readings in (19)–(26) there is an underlying AP, but in the causative readings in (10), (12), (16), (18) and (27) there is no AP?

Yet another intriguing question emerges. What is the relation between *-en/hiCCiC* in their causative function and *-en/hiCCiC* in their inchoative function? Note that if we were to argue that each function represents an

⁹ For a significant minority of native speakers of English the examples in (25)–(26) are ungrammatical under the intended reading. I return to this issue in section 4.3 below.

¹⁰ Once again, the relevant reading here is that, e.g., *the canal widened more than a river is wide*, and not that, *the canal widened more than a river widened*.

unrelated affix, and that one involves a structure with an underlying AP (the inchoative one) and the other (the causative) does not, we would face a puzzling coincidence. Why should these two widely distinct operations be marked by the same morpheme, with a (virtually) identical distribution? Even more puzzling, why should it be the case that precisely the same situation holds in Hebrew and in English: one and the same morpheme has both an inchoative and a causative function, with a (virtually) identical distribution, and with the identical evidence for an underlying AP in the inchoative case, but not in the causative case?

3. PARALLEL MORPHOLOGY

3.1. *On Autonomy*

Suppose now that this question is tackled by assuming the model of parallel morphology proposed in Borer (1988; forthcoming). Let me take a moment to elaborate on the relevant aspects of that model, beginning by discussing briefly the notion of *autonomy* as it applies to grammatical modules. Traditionally, it has been assumed that an autonomous component is, in essence, a block of rules whose application may not be affected by any factor or representation outside that module. Thus, for instance, the autonomy of syntax is intended to capture the fact that (specifically) semantic representations of any sort may not affect the application of syntactic rules. In the Standard Theory, for instance, semantic factors could not enter a structural description to influence a particular structural change. More often than not, this restriction has been captured by assuming that the interpretive component is simply ordered following the syntactic one (or preceding it, or both), and as a result, it is simply not available while the syntax is active.

As shown above, it is precisely this *ordered, linear* notion of autonomy which meta-theoretically underlies most common interpretations of the Lexical Integrity Hypothesis. For most proponents of an autonomous word formation component, such an autonomy entailed, by analogy, a complete separation between syntax and word formation that could only be captured if these components are ordered linearly with respect to one another.

But consider an alternative notion of autonomy, one that has been used implicitly or explicitly in many recent models: suppose a module is autonomous if (a) it has a distinct set of primitives not found in other modules; and (b) it constitutes a coherent set of formal operations which are distinct from those found in other components. According to this notion syntax and phonology, for instance, are distinct because, for example, the

former, but not the latter, involves syntactic categories, while the latter involves syllables. On the operational side, the syntax, for instance, involves non-local mapping operations. Or alternatively, the phonology, but not the syntax, utilizes tier representations. This notion of autonomy is implied in all the modular approaches to syntax, where, e.g., the theta module is independent from the Case module but not ordered with respect to it. It is further implied in models of Lexical Phonology, in which the phonology and the morphology are independent formally, and yet interacting at every representational level. In the Word and Paradigm Framework as in Anderson (1982) and subsequent work this notion is implied as well: the attempt to establish that inflectional morphology is "phonological" is based entirely on establishing the fact that inflectional morphology is formally derived by "phonological" rules, and the question of its respective ordering with respect to other components is essentially irrelevant.

Given this notion of autonomy it is clear that there is no particular need to maintain that two autonomous modules interact with one another at a fixed unique point. Rather, different operations may apply to particular representations simultaneously, and different modules would be allowed to "look at" intermediate representations derived by other modules, without compromising this notion of autonomy. (For a similar notion of autonomy, see Grimshaw 1985.)

Let us then assume that this is the way to characterize the interaction between word formation and syntax. I will assume that these autonomous modules are available simultaneously, in a parallel fashion, and that in principle, the relevant aspects of the output of each syntactic operation are available to the word formation component, and likewise, the relevant aspects of the output of each word formation operation are available to the syntax. Given any string, then, such a string would be subject to a set of syntactic well-formedness conditions on the one hand (e.g., the ECP, the Case filter, the Binding conditions, etc.), and to a set of morphological well-formedness conditions on the other hand (e.g., the satisfaction of morphological subcategorization, morphological percolation, etc.).

3.2. M-words and X^0 projections

Within current syntactic models, the question cannot be "is there head-to-head movement?" Given the most basic premises of these models, head-to-head movement is a direct consequence, and could only be blocked by stipulation. Assuming that the latter is an undesirable move, I would like to suppose that head-to-head movement does exist, and that it does give rise to derived X^0 projections. From the point of view of word-formation, however, another question must be raised: are these derived X^0 projections

words in the morphological sense of the word? I will assume that a morphological word, an *M-word*, is the output of the autonomous morphological component with its independent restrictions and properties. Given the autonomy of word formation, it is clear that head-to-head movement by itself, being a pure syntactic operation, cannot result in the formation of a morphological unit. At best, it can create the environment in which such word formation can take place. Thus a distinction is established between words which are derived by the word formation component, *M-words*, and X^0 projections, which might, or might not, be M-words. While M-words are the domain of morphological rule application, X^0 projections are a syntactic construct, displaying the characteristics of syntactic structures.

What, then, is an M-word? Minimally, and following work done by Lieber (1980) and Williams (1981a), suppose that affixes are morphemes with a subcategorization frame, and that once embedded in a word structure they are the head of that word, where by head I mean here a morphological notion distinct from a syntactic one. Thus an affix such as *-en* would be listed as in (28), and would enter the word structure in (29), in which its categorial properties as a head would be realized on the word projection:

- (28) *-en*: V, [V A —]
hiCCiC

(where linearity is chosen at random, for Hebrew, there being no evidence in Semitic for directional affixation.)

- (29)
- ```

 V
 |
 A V
 |
 wide -en
 laban hiCCiC

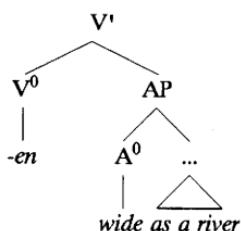
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Suppose that *morphological* subcategorization and the construction of word trees as in (29) are the basic operations of word-formation (although I will return to some others later). Note that these representations trivially rule out an occurrence of a word such as *-en* without the satisfaction of (28) (e.g., when it occurs by itself) as a violation of morphological subcategorization. They do not, of course, rule out words such as *wide*, since the lexical entry for *wide* is as in (30):

- (30) *wide*: A, [A —]

Consider now the (sketchy) syntactic structure in (31):

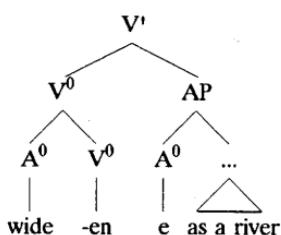
(31)



Note that verbs in English as well as in Hebrew may syntactically subcategorize for APs. (*John seems smart; ha-yalda nir'et xakama* ‘the girl seems smart’). It is clear that syntactically, the structure in (31) is well formed. However, morphologically it is not: the morphological subcategorization of *-en* is violated, leading to ungrammaticality.

But now suppose that the structure in (31) can be modified by head-to-head movement to result in the structure in (32). In (32), note, the *morphological* subcategorization of *-en* may be met:

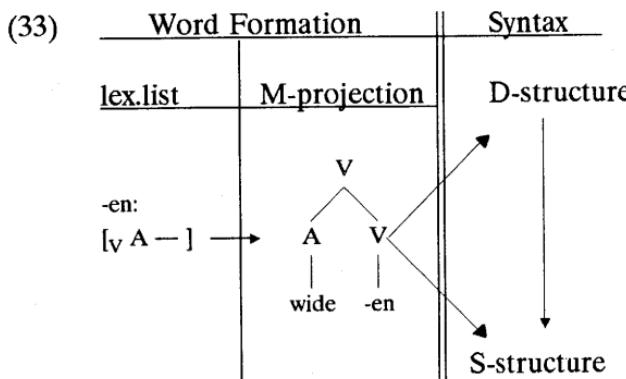
(32)



The pair (31)–(32) represents in essence, the analysis proposed for morphological operations by Baker, although Baker remains vague on the interaction between morphological subcategorization and syntactic structures. It is distinct from that proposed by Rizzi & Roberts (1989), however, in assuming that morphological subcategorization need not be realized syntactically by a particular D-structure. Rather, in (32) the morphological subcategorization of *-en* may be met at any stage, including, here, post-movement, without any special stipulation, morphological order and syntactic order being independent. Thus this system avoids the conflict between syntactic subcategorization and morphological subcategorization faced by Rizzi & Roberts, and allows a morphological subcategorization to be met without substitution, a property of syntactic rather than morphological structures.

In essence, then, I am proposing that head-to-head movement is always an adjunction structure, and that morphological subcategorization, a crucial building block in the construction of M-words, resides in the word formation component, and need not be projected syntactically at all. In order to be met, morphologically, only adjacency is required. Such

morphological adjacency is, of course, oblivious to syntactic distinctions such as substitution vs. adjunction, and the fact that it is achieved by adjunction is simply immaterial. Likewise, from the point of view of the morphological component the distinction between D-structure and S-structure is immaterial, these levels having no theoretical status whatsoever in that module. Rather, suppose that a syntax/morphology interface emerges which is more or less as schematized in (33):



In the picture in (33) there is absolutely no meaning to the statement that at D-structure, a morphological subcategorization is not met. Nor is there any need for syntactic adjunctions to count as satisfying subcategorization frames. As the WF component is an independent component, the ordering of its operations follows restrictions of its own, and the output may then be "plugged" into syntactic trees at any stage. While it is true that syntactic head-to-head movement creates the adjacency of morphemes which is required in order for the morphological operation to apply, there is no sense in which the morphological operation is inherently ordered with respect to any particular syntactic level. Rather, it applies independently, and is inserted in different syntactic levels.

What is really being proposed here is a model of lexical insertion. Suppose that morphological hierarchies, constructed by morphological operations, are inserted, potentially, into any syntactic representation, providing the correct environment for their insertion is met. Given, for instance, the structure in (32), the morphological structure in (29) is inserted, or superimposed, on the relevant morphemes in (32), thus making them an M-Word. Such superimposition is possible because (28) is part of the WF component.

### 3.3. D-Structure insertion

I have considered the status of an M-word inserted following head-to-head movement. What, however, is the status of M-words inserted at D-structure, before any movement has taken place?

Consider now what D-structure insertion would mean. Suppose we conceptualize D-structure as the "turning-on point" of the syntax, and suppose that as D-structure is "turned on", syntactic structures are projected from lexical entries based on the label attached to the root nodes. These labeled root nodes may dominate M-word complexes, but these M-words, derived without the availability of any syntactic structures, I suggest, are syntactically opaque. It is worthwhile stressing that due to the parallel and orthogonal nature of the morphology it need not be assumed that these previously derived M-words are derived by morphological operations which are distinct from those which are available at later points in the syntax. On the contrary. The system outlined here suggests that the very same operations which are available throughout the syntactic derivation are available prior to it, their output inserted at D-structure fully formed.

Why, then, are morphological structures inserted at D-structure syntactically opaque, while morphological structures inserted later on are transparent? I would like to propose that this is, in fact, the wrong way to look at the question. The right way entails that morphological structures are always syntactically opaque. In fact, let us suppose that the notion of autonomy implies precisely that: not that modules are ordered as blocks with respect to each other, but that, given the difference in primitives and in formal operations, the only structures which are syntactically transparent are structures which include primitives and configurations which are syntactically meaningful. M-words as such are not such structures.

Consider now the structure of *widen* in (32). What accounts for the syntactic transparency of this structure? Well, the structure is syntactically transparent because of the *syntactic* phrases which dominates it. The morphological structure which dominates it, as in (29), is syntactically opaque, just as its phonological structure is syntactically opaque. But the AP, and the A-trace, as well as the  $V^0$  created by head-to-head movement in (32) are entirely syntactically derived, and hence they are certainly transparent. Similarly, for the WF component, the only items which are transparent in (32) are those which have morphological meaning: the terminal nodes and the morphemes they dominate. The entire structure and its derivational history are morphologically opaque. Note crucially, however, that in (32) the M-word is opaque due to its *morphological* characterizations, and not due to the fact that it is dominated by  $X^0$ . Thus we do not expect  $X^0$  structures which do not correspond to morphological structures

to be similarly opaque (possible cases illustrating such syntactic transparency might be cases of excorporation as discussed in Roberts 1991).

But if an M-word such as *widen* is inserted *as such* into D-structure, it is dominated by a single terminal  $V^0$ . If it is syntactic structures which are syntactically transparent rather than *M-words*, it is clear that *syntactically*, when *widen* is inserted at D-structure, it has no syntactic structure, and hence it is perfectly syntactically opaque. Whatever internal structure it has is *morphological*, and the syntax is oblivious to that. As a result, none of the syntactic properties of the adjective *wide* embedded in *widen* are syntactically active. Similarly, if the Hebrew form *hilbin* is inserted into D-structure as it is, dominated syntactically exclusively by  $V^0$ , the syntax is not expected to be sensitive to its internal structure. In other words, *M-words* inserted at D-structure are dominated by a unique  $X^0$ , have a plain, non-branching syntactic structure, and as a result, all syntactic well-formedness conditions apply to them entirely vacuously. On the other hand *M-words* inserted at any other level of representation have both a syntactic structure and a morphological structure. It is their syntactic structure, rather than their morphological structure, which renders them syntactically transparent.<sup>11</sup>

On the other hand, note that a word inserted following D-structure, which is both an M-word and an  $X^0$  with a complex syntactic structure, results in the impossibility of any semantic drift in that case. The dual representation as both M-word and  $X^0$  with an internal structure ensures that such words will always have as a subpart of their meaning the semantic and selectional properties of the phrases embedded in them, or a violation of the Projection Principle would result. This is clearly an extremely desirable result.

Of course, M-words which do not have a syntactic representation are not thus constrained. They are constrained exclusively by the properties of morphological rules, and as is argued in Borer (forthcoming), there is no automatic retention of argument structure under morphological derivation. As a result, some properties of the embedded morphemes may and will disappear, without any violation resulting.

<sup>11</sup> It is at this point that the theoretical distinction between what is proposed here and a U(T)AH-type system becomes clear. It is explicitly assumed here that words inserted at D-structure do *not* correspond to phrasal syntactic structures, and that grammatical function changing morphology need not project syntactically. Note that even if it is assumed that U(T)AH may be satisfied by the base-generation of incorporated structures and their coindexed traces (see fn. 3) this would still result in identical syntactic configurations for D-structure and S-structure insertion, contrary to what is proposed here. It is thus clear that what is at stake is not just the technicalities of lexical insertion, but a crucially different view on the interaction of morphology and syntax. As will become clear below, it is precisely this distinct syntactic structure (but morphological identity) that will account for the causative-inchoative paradigm, by proposing structures that cannot be accommodated by a U(T)AH-type approach.

#### 4. THE INCHOATIVE-CAUSATIVE ALTERNATION: AN ANALYSIS

##### 4.1. An account

Returning now to the inchoative-causative alternation, and supposing that both *-en* and *hiCCiC* are specified morphologically as subcategorizing for an A (see (28)), the resulting M-word would thus be as in (29). (29) could be inserted at D-structure. If this is the case, the properties of the adjective embedded in it are going to be syntactically opaque, since the syntactic structure, as such, simply does not contain an AP, or even an A. The fact that the verb contains in it such an A is syntactically irrelevant. Thus adjectival modification is not expected, nor is a realization of the range of complements of the adjective. The structure would be syntactically dominated exclusively by a  $V^0$ . Note now that the range of properties associated with the causative derivations in (9), (10), (12), (16), (18) and (27) is the range of properties expected from the pre-syntactic derivation: A is opaque and no AP is present in the structure. I will argue below that, for independent reasons, this is the only derivation available for the causative reading.

On the other hand, (29) could be inserted following head-to-head movement, having roughly the syntactic structure in (32), but still the morphological structure in (29). If this is the case, the generation of a full AP is actually forced by the fact that  $A^0$  heads a syntactic projection at D-structure.

Both the D-structure and the S-structure of the derivation in (32) contain an AP, and a prediction is thus made that a derivation associated with these trees will exhibit properties associated with AP. This derivation, I claim, is the one associated with the inchoative reading in (19)–(26). In these cases, the presence of an underlying AP is attested clearly, strongly arguing for a syntactic derivation. It thus turns out that under the assumption that *-en* and *hiCCiC* morphologically subcategorize for an adjective, the two predicted derivations: one resulting from a D-structure insertion, and the other resulting from post-D-structure insertion, are actually attested.

##### 4.2. Why inchoative-syntactic and causative-pre-syntactic?

A number of important questions remain open in the structural analysis above. First, what is the relationship between the inchoative *-en* and *hiCCiC* and the causative *-en* and *hiCCiC*? Second, and equally important: why is the syntactic derivation associated only with the inchoative reading, while the pre-syntactic one is associated with the causative one?

I will commence by assuming that both *-en* and *hiCCiC* are specified as optionally assigning an external θ-role (and by a contrast, e.g. *-ize* must assign an external θ-role). I will further assume that the particular thematic value of that θ-role need not be specified, and that, once added, it is immediately marked as an *agent*, or *causer* in line with proposals made in Williams (1981b), and Borer & Wexler (1987).

I will now assume with Lieber (1980) that both primary and secondary percolation applies to morphological structures, my M-words, and thus to the structure in (29), regardless of whether it is inserted at D-structure or at a subsequent stage.

Following percolation, the head of the formed *M-word*, the affix (*-en* or *hiCCiC*) will determine the category type of the resulting word. Now consider the argument structure. Note that four cases must be considered here, as indicated by the table in A:

| A.                         | +external | -external |
|----------------------------|-----------|-----------|
| D-structure insertion      | 1         | 3         |
| Post-D-structure insertion | 2         | 4         |

Consider first the case (A1) in which *-en* and *hiCCiC* select an external argument, and the morphological derivation is pre-syntactic. In this case, the external argument selection property percolates from the heads, *-en* and *hiCCiC*, to the word root. What about the A? Consider a predicative adjective which assigns an external argument (a situation argued by Higginbotham 1985 to hold universally, but see below for more discussion). In the word structure in (29) this property may not be realized, since it conflicts with the external argument selected by *-en* and *hiCCiC*. However, since the derivation is pre-syntactic, it results in a per-force internalization of the redundant external argument. Since *-en* and *hiCCiC* take no internal arguments themselves, the internalized argument becomes a direct object, and the derivation gives rise to the D-structure in (34), in which *whiten* and *hilbina* have been pre-syntactically derived:

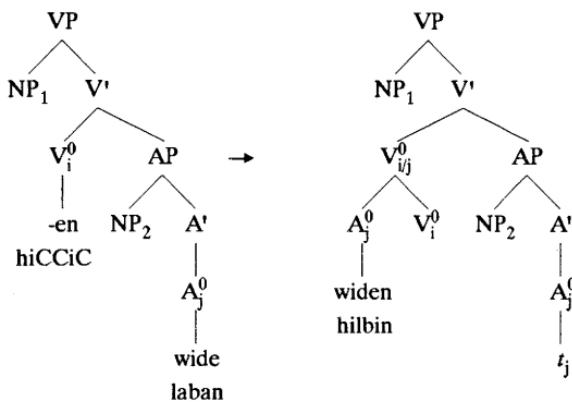
- (34) a. The wash [VP [V whitened] the sheets].  
       b. Ha-kbisa [VP [V hilbina] 'et ha-sadin].

Clearly, an identical result would obtain if the adjective assigned an internal argument (a situation argued for some adjectives by Cinque 1990). In this

case, the external argument selected by *-en* and *hiCCiC* will continue to be selected by it, and the internal argument of the A will simply become the internal argument of the entire morphological complex.

Consider, however, case (A2), in which both *-en/hiCCiC* and the adjective select an external argument and the derivation is syntactic. This derivation is depicted in detail in (35):<sup>12</sup>

(35)



In (35), the external argument of A cannot be realized in the NP<sub>1</sub> position, since the external argument of *-en* and *hiCCiC* is realized there. Internalization, on the other hand, is clearly barred in a syntactic derivation by the Projection Principle. In fact, percolation of arguments from a subordinate morpheme to a dominating M-word is altogether barred in a syntactic derivation, as it would clearly violate the Projection Principle. As a result, the external argument of A cannot be associated at all with the output M-word. But can the external argument of A be realized in NP<sub>2</sub>, being a property of the embedded AP but not of the dominating VP? While it is true that the trace of A heads the maximal projection that dominates NP<sub>2</sub>, and that an external argument of an adjective could be realized in such a position, (as in *John made the sheet white*; *?Dan 9asa 'et ha-sadin laban*), I would like to argue that the resulting structure is nevertheless ungrammatical.

Consider why. I assume, in line with proposals made in Borer (1984), (and see also Baker 1985, 1988) that in (35) and similar M-structures when A incorporates and becomes part of a complex M-word, its index must

12 As is evident from the structure in (35), the internal subject hypothesis proposed in various forms by Kuroda (1986), Kitagawa (1986), Koopman & Sportiche (1988), and others, is adopted here. For the purpose of this paper the question of whether that subject is adjoined to VP or is sister of V' is immaterial. In the text, the latter position is adopted, but nothing crucial hinges on it.

percolate and become part of a composite index associated with the complex A+V in (35). This percolation, a case of secondary percolation par excellence, occurs only when an M-word has been formed, but not where head-to-head movement applies without a resulting M-structure. Thus in (35), the superordinate V<sup>0</sup> and the trace of A<sup>0</sup> are coindexed, by virtue of the formation of an M-word between the verbal morpheme *-en/hiCCiC*, and the adjectives *wide/laban* (and see Chomsky 1986 where such coindexation is assumed to hold between the trace of a raised V and the I into which the moved V incorporated). I will assume that the resulting coindexation between the verb and the adjective, and hence between the VP and the AP is a *predicate-chain*. Assuming further that heads are coindexed with their specifiers, in the case of (35), the subjects NP<sub>1</sub> and NP<sub>2</sub> respectively, it thus follows that in a structure such as (35) NP<sub>1</sub> and NP<sub>2</sub> are coindexed. I would like to propose now that when coindexed in such a fashion, NP<sub>1</sub> and NP<sub>2</sub> constitute an (A-) chain, and that by the Theta-Criterion and the Projection Principle, this chain may only be assigned one θ-role. It follows that predicate chains may only be associated with one external argument. I will refer to this result as the Predicate Chain Theorem (PCT), made explicit in (36):

(36) *The Predicate-Chain Theorem*

A predicate chain may only have one external argument

I might mention just as a comment that (36) provides a direct explanation for the fact that in Pollock-type systems, subjects of functional heads are never thematic.

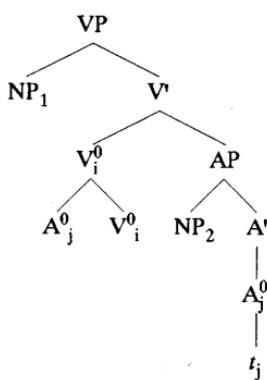
Consider now the derivation in (35). At D-structure, both NP<sub>1</sub> and NP<sub>2</sub> are filled by an external argument, in accordance with the Theta-Criterion. Following the creation of a predicate chain between V<sup>0</sup> and A<sup>0</sup>, however, NP<sub>1</sub> and NP<sub>2</sub> must be coindexed, as each is coindexed with its head. Such coindexation, however, leads to the formation of an A-chain which is assigned two θ-roles: the external role of A and the external role of V. A violation of the Theta-Criterion results. It is now clear that the causative reading, in which, perforce, there are two external arguments, is a syntactic impossibility. Internalization, allowed pre-syntactically, is blocked by the Projection Principle, and the presence of two external arguments in the absence of internalization leads to ungrammaticality as well. The causative derivation is thus confined to the pre-syntactic stage.<sup>13</sup>

13 Note that Hebrew does not have θ-affixation, rendering a derivation as in (i) independently implausible (and see Borer, forthcoming for discussion):

(i) [[[laban A] hiCCiC v-INCH] θ v-CAUSE]

Interestingly, a predicate-chain is only formed if an M-word has been created, and where secondary percolation which applies in M-structures exclusively results in the (obligatory) percolation of the index of an embedded A to the superordinate V. Consider, however, the possibility that a head-to-head movement has created a  $V^0$  structure containing two predicates each selecting an external argument, but there is no M-word. This case is depicted in (37):

(37)



As in (37) no M-word has been formed, such a structure cannot satisfy any morphological restrictions, and is thus not available for forms such as Hebrew *hiCCiC* and English *-en*. In these cases, an M-word must be formed to satisfy the morphological restrictions expressed in (28). However, consider a grammar in which the causative verb is not a bound morpheme, but head-to-head movement applies nevertheless, adjoining a subordinate verb to that causative verb. In this case, no M-word is formed, no secondary percolation takes place, and as a result, no predicate-chain is formed either. In such cases, as (37) illustrates, the coindexation is exclusively between  $A^0$  and its trace, while the  $V^0$  carries a distinct index. In these cases, we may assume that A antecedent-governs its trace directly, as it is not dominated by every segment of V, and hence not included in V. This situation, truly reminiscent of syntactic adjunction to VP and the antecedent-government configurations it creates, does not violate the principle in (36). Effectively, then, it is claimed here that the structures in (35) are excluded in English and in Hebrew due to the fact that an M-word is formed between the adjective and the cause morpheme, and that it is this M-word that leads to a coindexation between that M-word in its entirety and the trace of the moved adjective. On the other hand (37), which does not lead to a

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It is thus unlikely that the opacity effects exhibited in causative forms could be somehow attributed to the depth of embedding of the adjective.

formation of predicate-chain, fails to satisfy the morphological subcategorization of *-en/hiCCiC*. In Borer (forthcoming) it is suggested that (37) is the structure of Japanese causatives, where head-to-head movement applies, but an M-structure is not formed. In such cases, no secondary percolation applies, and the Predicate Chain Theorem is not triggered. The result is a genuine bi-clausal causative structure (and see Kuroda 1981, for some discussion).<sup>14</sup>

Note now that the Predicate-Chain Theorem only excludes structures in which an M-word is formed from two predicates which assign an external θ-role. By hypothesis, a causative verb or morpheme always assigns such a role. However, when the subordinate predicate assigns an internal role exclusively, the structure in (35) is expected to be well formed: the causative morpheme would assign its role externally as required, and the embedded predicate, be it an adjective or a verb, assigns its role internally, and no violation results. Interestingly, M. Baker (p.c.) reports that this is the situation attested in Mohawk, where causative formation is restricted to unaccusative verbs.

An interesting test case could be provided by the class of adjectives argued by Cinque (1990) to be unaccusatives, including, in Italian, adjectives such as *note*, *probabili*, *oscuro*, *prevedibile*, *chiaro*, *ormai*, *evidente* and others (respectively, ‘well-known’, ‘probable’, ‘obscure’, ‘foreseeable’, ‘clear’, ‘sure’, ‘evident’). In principle, it is predicted that such unaccusative adjectives could participate in bi-clausal causative formation. Note, however, that morphological constraints appear to bar independently the affixation of causativizing morphemes such as *-ify*, *-ize*, and *-en* to these adjectives, thereby making the testing of this hypothesis impossible.<sup>15</sup>

14 A full review of Kuroda's arguments is outside the scope of this paper. He does, however, offer a range of convincing arguments that show that the “embedded” verb and the causative morpheme *sase* do not form a morphological unit, thus arguing against a morphological structure, but not necessarily against a syntactic head-to-head configuration.

A reviewer suggests that the structure in (37) is applicable to Dutch and German, accounting for Verb Raising constructions in which an embedded external θ-assigning head may incorporate into an external θ-role assigning higher head, but word-formation, as such, does not seem plausible.

The reader may note that no explanation is offered at this point for the availability in some languages, but not in others, of structures such as (37). As such, the structure in (37) joins a range of other constructions (e.g., verb second, *tough*-movement, exceptional Case assignment, Construct State formation, resumptive pronoun strategy) which occur in some languages but not in others, for reasons that remain unknown at present.

15 Clearly, we are only touching here the tip of an iceberg. Thus, a possible test for the unaccusativity of adjectives in English indicates that not all the unaccusative adjectives of Italian translate into unaccusative adjectives in English. (*Semi-*) argument control is impossible with *likely*, *possible* and *probable*, but possible with *self-evident*, *known* and *clear*, suggesting that the latter, but not the former, assign an external argument and are subject to real extraposition:

Now consider the derivations in which *-en* and *hiCCiC* do not select an external argument. Consider first the pre-syntactic derivation in (A3): in this case, no internalization is required: in the absence of an external argument for the head V, the external argument of the complement A may percolate up, and be realized in the subject position in sentences such as (34):

- (38) a. Ha-sadin [<sub>v</sub> hilbin].  
       b. The sheet [<sub>v</sub> whitened].

Consider now a syntactic derivation. In reference to structure (35), again, at D-structure, only NP<sub>2</sub> is assigned a theta-role by A. NP<sub>1</sub>, being non-thematic, remains empty. Following the creation of a Predicate Chain, the two NPs are coindexed, but this time, no ungrammaticality results. Rather, a raising configuration emerges, with the external argument of AP moving to NP<sub>1</sub>, creating a single predicate chain with a single external argument chain, in accordance with (36). This derivation results in the inchoative reading.

Interestingly, this system derives the result that the inchoative reading is available both pre-syntactically, giving rise to a projection such as (39), with no syntactic adjective, and syntactically, resulting in syntactic structures such as (40), in which there is an embedded syntactic AP:

- (39) the sheet<sub>i</sub> ...[<sub>VP</sub> t<sub>i</sub> whitened]

- (i) a. \*It is possible without being probable that Mary will be late.  
       b. It is clear without being self-evident that Mary will win.

Furthermore, for reasons that require additional investigation, many of these unaccusative adjectives may not be embedded in causative constructions with an agent causer quite independently of word formation:

- (ii) a. The circumstances/?John made it likely for Marcia to win.  
             The circumstances/?John made Marcia likely to win.  
       b. The events/\*John made it probable that Marcia will win.

Of particular interest is the behavior of the adjective *clear*, as it is the one adjective in this list that allows the affixation of a causativizer morpheme, *-ify*. The adjective *clear*, as it turns out, is ambiguous between a reading roughly synonymous with *self-evident* or *certain*, and a reading roughly synonymous with *understood* (setting aside the literal meaning, 'transparent'). This latter meaning quite plausibly is an unergative. Yet it is only the latter reading which is available in embedded causatives:

- (iii) a. John made it clear that Marcia will be hired.  
       b. John made it understood that Marcia will be hired.  
       c. \*John made it self evident/certain that Marcia etc.

On a par, *clarify* only has the reading 'make-understood' or 'make transparent' but not 'make self-evident'. It thus appears that *-ify* only attaches to the unergative version of *clear*, making it impossible to use it as a case study for the predictions made by the Predicate Chain Theorem.

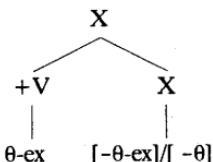
- (40) the sheet<sub>i</sub> [VP [white<sub>k</sub> + en] [AP t<sub>i</sub> t<sub>k</sub>]]

Specifically, note that in the pre-syntactic derivation depicted in (39), the role assigned by the adjective is now assigned externally by the inchoative form. In (40), on the other hand, the role continues to be assigned by the adjective, internal to the inchoative verb.<sup>16</sup>

Independent tests of argument structure in MH directly confirm this double structure. Borer & Grodzinsky (1986) show that reflexive datives in Hebrew may only be coindexed with the external argument of the verb or the adjective to which they are attached. On the other hand, possessive datives must be coindexed with VP-internal material, and may not be coindexed with the external argument. Consider now (41) and (42). In (41), the reflexive dative *lahem* 'to-them' is coindexed with the subject of the inchoative verb, suggesting that it is an external argument. In (42), on the other hand, the possessive dative *li* is coindexed with the subject of the inchoative verb, suggesting that 'apples' is not the external argument of the verb. Yet, both sentences are fully grammatical:<sup>17</sup>

16 Note that while this system strongly predicts that externalization as in (39) is only possible in pre-syntactic derivation, it does not follow from the system presented here that all pre-syntactic derivations always result in externalization (i.e., I do not claim here that there are no pre-syntactically derived morphologically complex unaccusatives). Thus it is conceivable that the following morphological structure exists:

(i)



Suppose (i) to be a morphological structure in which a verb or an adjective assigning an external role is attached to an affix that is specified as incapable of assigning an external  $\theta$ -role, or, indeed, any  $\theta$ -roles. In such a configuration, secondary percolation would be blocked, and the X node would not inherit the external argument of the [+V] element. As in a pre-syntactic derivation the [+V] element would be barred from assigning an external  $\theta$ -role itself (the appropriate external node would fail to be projected) the situation would in principle be resolvable either by an internalization of that role, or by its deletion. In Borer (forthcoming) it is shown that when X=N, deletion results, as N is never a  $\theta$ -role assigner. For a different selection of X, however, it is possible that an internal role can be assigned, but not an external one. The existence of such configurations remains the target for future research. Plausibly, this may be the correct representation for (pre-syntactic) adjective-derived inchoative constructions in languages such as Dutch, where auxiliary selection suggests that they are always unaccusatives.

17 Two more tests for unaccusative structures are known in Hebrew: a cliticization of a locative pronominal PP from VP-internal NPs, and the distribution of some negative polarity items. These, exemplified in (i) and (ii), respectively, show that inchoatives have an unaccusative derivation:

- (41) a. Ha-tapuxim hibSilu lahem<sub>i</sub> ba-SemeS ha-abbit.  
          the-apples<sub>i</sub> ripened to-them<sub>i</sub> in the spring sun.  
   b. Ha-batim<sub>i</sub> (halku ve-) hiSxiru lahem<sub>i</sub> ba-'abaq.  
          the-houses<sub>i</sub> (went and-) blackened to-them<sub>i</sub> in the dust.

(42) a. Ha-tapuxim hibSilu li.  
          the-apples ripened to me  
          'My apples ripened.'  
   b. 'Axrey harbe Sanim Sel abaq, ha-bayit hiSxir li.  
          after many years of dust, the-house blackened to me  
          'After many years of dust, my house blackened.'

This apparent paradox can be easily resolved if it is assumed that (41) corresponds to the structure in (39), in which *tapuxim* and *batim* are external to the VP, and hence they allow coindexation with a reflexive dative. As in these cases there is no syntactic adjective, we do not expect modification by *yoter* 'more' and *kmo* 'like', or by the adjectival modifier *haki A Se-epSar* 'as A as possible' and *lehapli*, 'wonderously'. On the other hand, (42) corresponds to the structure in (40), where an adjective is syntactically

- (i) a. ba-nisui, hilbinu miSam SloSa sdinim.  
           in-the-experiment, whitened from-there three sheets  
           'Three sheets from there whitened in the experiment.'

b. Sney sirim hiSxiru mikan (ketoca'a me-ha-srepa).  
           two pots blackened from here (as a result of the fire)  
           'Three pots from here blackened (as a result of the fire).

(ii) a. lo hilbin kol sadin.  
           not whitened any sheet  
           'No sheet has whitened.'

b. lo hiSxir kol sir.  
           not blackened any pot  
           'No pot has blackened.'

Jaeggli (1987) suggests that arbitrary 3rd person plural *pro* is only licensed if it is assigned an external θ-role. Thus the grammaticality of (iii a–b) further supports the claim that inchoatives have an ambiguous derivation. However, as arbitrary *pro* needs to be specifically capable of volitional action as well, it will only occur with inchoatives with a [+human] subject, rendering the applicability of this test limited:

- (iii) a. he'edimu kan mi - buSa kSe - Sam'u Se - nikSalta.  
          reddened here from-shame when-heard that -failed-you  
          3rd-MASC-PL                                   3rd-MASC-PL  
          'People here reddened with shame when they heard that you failed.'  
      b. hiSminu kan me - rob naxat kSe-Sam'u Se-hiclaxta.  
          fattened here from-pleasure when-heard that-succeeded-you  
          3rd-MASC-PL                                   3rd-MASC-PL  
          'People here became fat from pleasure when they heard that you succeeded.'

present. Here, the surface subject is the raised external argument of the adjective which is, of course, internal to the VP, thus allowing coindexation with a possessive dative, and also, in the analysis proposed here, adjectival modification. Going an additional step, then, it is predicted that reflexive datives and adjectival modifiers be incompatible with one another, but there will be full compatibility between possessive datives and adjectival modifiers. This prediction is borne out, as is illustrated in (43a-c):

- (43) a. \*Ha-bayit<sub>i</sub> hiSxir lo<sub>i</sub> haki Se'epSar/lehapl.  
          the-house blackened to-it most possible/wondrously  
  b. Ha-bayit hiSxir li haki Se'epSar/lehapl.  
          the-house blackened to-me most possible/wondrously

In a similar fashion (44) suggests that syntactically, *batim/tapuxim* cannot be an external argument when a causative reading is present:

- (44) a. Ha-'abak hiSxir li/\*lahem<sub>i</sub> 'et ha-batim<sub>i</sub>.  
          the-dust blackened to me/\*to-them<sub>i</sub> ACC the-houses<sub>i</sub>.  
          Only: 'The dust blackened my house.'  
  b. Ha-SemeS hib'sila li/\*lahem<sub>i</sub> 'et ha-tapuxim.  
          the-sun ripened to-me/\*to-them<sub>i</sub> ACC the apples<sub>i</sub>.  
          Only: 'The sun ripened my apples.'

#### 4.3. A note on comparative and absolute adjectives

In the previous discussion the meaning of de-adjectival verbs, whether in English or in Hebrew, was given as 'make white/black', 'become white/black' etc. However, it is clear that regardless of the causative or inchoative context, these forms are in fact ambiguous between a reading of 'make/become white/black' etc., and 'make/become whiter/blacker' etc.

The ambiguity of inchoative verbs between "become Adj" and "become Adj-er" is specifically discussed by Abusch (1985). Abusch illustrates the comparative use of inchoatives with the contrasts in (45):

- (45) a. The Atlantic ocean is wide and is widening.  
  b. \*The Atlantic ocean is wide and becoming wide.  
  c. The Atlantic ocean is wide and becoming wider.

Additional indications of the ambiguity of inchoatives is given by the use of durative time adverbials, as in (46)-(47), and state modifiers, as in (48):

- (46) a. The sky darkened for half an hour.  
b. The Atlantic ocean widened for three years.
- (47) a. The sky darkened in half an hour.  
b. It took the Atlantic ocean three years to widen.
- (48) The sky darkened completely/absolutely.

Note now that the syntactic properties of causatives and inchoatives, respectively, cannot be reduced to the absolute vs. comparative interpretation. Thus in (49), the *causative* meaning of *he'edima*, 'reddened' is comparative, meaning 'make redder'. Causative *hiSxira* 'blackened' on the other hand is used with an absolute meaning, 'make black'. Specific adjectival modification of any sort is nevertheless equally ungrammatical in both. A similar situation is illustrated for English in (50):<sup>18</sup>

18 Note in these contexts that modifiers such as *completely*, *absolutely*, *in three hours*, *for three hours*, etc., cannot be used as diagnostics for the existence of an AP, as all these modifiers are compatible with underived verbs, as is illustrated by (i):

- (i) a. John laughed for three hours.  
b. Mary ate the cookies in three mintues.  
c. John refused the appointment absolutely.  
d. Mary eliminated the ants completely.

Of particular interest, however, is the fact that the modifiers *completely*, *absolutely*, *in three hours* have a distribution not unlike that of resultative constructions in English, and must co-occur with either an internal argument, or with an AP (see Carrier & Randall, to appear, Rappaport-Hovav & Levin 1991 for some discussion of resultative constructions in English):

- (ii) a. \*Mary laughed in three mintues.  
b. \*John worked absolutely.  
c. \*Mary ran completely.
- (iii) a. The river froze in three minutes.  
b. The woodwork was destroyed completely.  
c. The window is absolutely broken.

For this reason, the distribution of these modifiers can be used as a diagnostic for the presence of an internal argument in both inchoatives and causatives, but it is neutral with respect to the presence of an AP in these structures. As such, these modifiers contrast with *more* and *like* phrases in English and in Hebrew, and with expressions such as *haki A Se'epSar* and *lehapli* ("as A as possible" and "wondrously") in Hebrew, which are restricted to AP contexts.

- (49) Ha-SemeS he'edima 'et ha-tapuxim (legamrey/\*yoter mi-dam/  
 the-sun reddened the-apples (completely/\*more than blood/  
 \*lehapli/\*haki Se'epSar) mi - april 9ad may, ve-'az ba'a  
 \*wondrously/\*as possible) from April to May and then came  
 ha- kara. ve-hiSxira 'otam (legamrey/\*kmo pexam/\*lehapli/  
 the frost and blackened them (completely//\*like coal/\*wonderously/  
 \*haki Se'epSar)  
 \*as possible)
- (50) The sun reddened the apples for three months (\*more than blood)  
 and then the frost came and blackened them completely (\*like coal).

Likewise, (syntactic) inchoative derivations allow both absolute and comparative readings, as is clear from (51). Recall that syntactic derivations are restricted to inchoatives, having the structure in (40). The structure in (40), recall, can be forced in Hebrew (and the one in (39) excluded) by using the possessive dative, which must bind a VP-internal NP, not available in (39). As is illustrated by (51), both comparative and absolute modification are possible in such inchoatives:<sup>19</sup>

- (51) a. Ha-kbia hilbina li be-meSex SaloS Sa9ot.  
 the wash whitened to-me for three hours  
 'My wash whitened for three hours.'  
 b. Ha-kbia hilbina li tok SaloS Sa9ot.  
 the-wash whitened to-me in three hours  
 'My wash whitened in three hours.'

It thus appears that the availability of both absolute and comparative readings is independent of the syntactic vs. pre-syntactic application of WF, and both must be assumed to be syntactically available for inchoative constructions, and pre-syntactically for causatives.

19 Whether or not pre-syntactically derived inchoatives are likewise ambiguous is hard to test. Recall that these forms have an external argument exclusively, thus making their occurrence incompatible with modifiers such as *completely*, *absolutely*, and *in three hours* (see fn. 18 for discussion). On the other hand, the absence of absolute modifiers which correlate with an external argument suggests that in the absence of an internal argument an absolute reading is barred, and thus that pre-syntactically derived inchoatives are unambiguously comparative in nature. To the extent that this is correct, it provides additional evidence for the dual structure assigned to inchoatives in this work.

Note, however, that the ambiguity of a de-adjectival form cannot be taken to be the rule. Rather, it is possible that as a result of the properties of the affix itself, or possibly those of the adjective to which it attaches, only one of the readings is available. Such, it appears, is the case of both inchoative and causative verb *quicken*, derived from the adjective *quick*. Centering on the inchoative reading, *quicken* clearly does not have the reading 'become quick'. Its interpretation is restricted to 'become quicker', as is illustrated by (52):<sup>20</sup>

- (52) a. His pace quickened a lot.
  - b. His pace quickened for twenty minutes, and then slowed again.
  - (52) c. His pace quickened in twenty minutes.  
 (only "took twenty minutes to become quicker",  
 NOT "became quick in twenty minutes".)
- (53) \*His pace quickened completely/absolutely.

The exclusion of an absolute reading in the case of *quicken* can now be utilized to account for the ungrammaticality of (54b): as *quicken* has a comparative reading exclusively, the modification with an *as* or *like* phrase results in ungrammaticality for (54b) just as it does for *quicker* in (55a). Modification with a comparative expression in (54c), on the other hand, appears to be ungrammatical due to the redundant use of a comparative verb and a *more*-phrase, on a par with (55b):

- (54) a. He was quick like a bunny.
  - b. \*He quickened as/like a bunny (is quick).
  - c. \*He quickened more than a bunny.
- (55) a. \*He became quicker as/like a bunny.
- b. He became quicker (\*more) than a bunny.

Interestingly, for a significant minority of English speakers, all inchoative forms have an exclusively comparative reading. For these speakers, examples such as (56a–b) contrast with (57a–c) (where this dialectal ungrammaticality is marked as #):

- (56) a. The sky darkened quite a lot.  
       b. The sheet whitened for three hours.

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20 The properties of the verb *quicken* were brought to my attention by R. Fiengo.

- (57) a. #It took the ocean 3 years to widen.  
 b. #The sheet finally whitened.  
 c. #The sheet whitened in half an hour.

The judgements given by these speakers are thus consistent with the assumption that an inchoative reading is only obtained with a comparative adjective. At the same time, causatives continue to be fully ambiguous:

- (58) a. The bleach finally whitened the sheet/in 5 minutes.  
 b. The bleach whitened the sheet quite a bit.

While I have no account at this point for this interesting dialectal split, note that to the extent that it exists, a prediction is made that for speakers of this dialect the use of both *like*-phrases and *more*-phrases with inchoatives should always be barred, on a par, again, with the ungrammaticality of (55a-b). This prediction is borne out. For speakers of this dialect, the following are ungrammatical (as are, of course, examples (25)-(26) above):

- (59) a. #The sheet whitened more than snow.  
 b. #The sheet whitened like snow.

Note that although (59a-b) and (25)-(26) are ungrammatical for these speakers, it is not possible to conclude that for these speakers an AP is not projected. As was shown by (51), a syntactic inchoative derivation is compatible with both absolute and comparative readings. The exclusion of the absolute reading thus does not reflect directly on their syntactic derivation.<sup>21</sup>

To conclude, I have shown that using the Parallel Morphology approach to the morphology/syntax interface, it is possible to capture in a unified way the morphological properties of the inchoative and the causative constructions, without sacrificing in any way an account of their distinct syntactic properties. The account thus strongly supports the existence of an autonomous morphological component, interacting with the syntax, but not reducible to it. It might be noted that neither a linear model, restricting

21 An approach assuming a full projection of AP in both causatives and inchoatives would not be instrumental in trying to explain the contrast between inchoatives and causatives for speakers of the relevant minority dialect. As in such a system AP would project fully in both cases, one would still have to exclude the absolute reading in inchoatives in the relevant dialect, while allowing causative forms to have both interpretations.

While the reasons for such a dialectal split must await future research, note that in languages such as Dutch, in which inchoatives are never modified by *more* phrases or *like* phrases, a similar situation is likely in effect.

morphological processes to a pre-syntactic stage, nor a syntactic model, making an in-principle distinction between morphology reducible to syntax and morphology non-reducible to syntax can capture these facts. While in a linear model the syntactic observations and properties associated with inchoative derivations would have to be stipulated as ad-hoc results of an idiosyncratic process, in a syntactic model there would be no way to capture the obvious morphological relatedness of the two processes, rendering their relatedness an unexplained coincidence. In a model which allows the lexicon as well as the output of the WF component to be available for insertion at any stage, none of these problems arise.

## 5. SOME CONCLUDING COMMENTS ON THE UAH AND SEMANTICALLY-BASED SYNTAX

Much of this paper has been devoted to presenting a case study of morphological derivation where from an identical form, two distinct D-structures have been projected. As such, this case study presents a serious problem to the basic intuition underlying U(T)AH, according to which D-structure is a strict projection of θ-role assignment configurations, where identical thematic/semantic roles must be projected in fixed structural positions. As such, the case of the causative-inchoative alternation joins the well-known case of adjectival and verbal passives, in presenting a direct problem for the direct mapping from lexical semantics to syntax.

Ironically, when it comes to the relations between lexical semantics and syntax, there is a striking similarity between proponents of U(T)AH and proponents of some (but not all) strong lexicalist models, notably those based on lexical semantics. In both these approaches, it is assumed that syntactic primitives are not, in fact, syntactic categories, but rather, thematic/semantic roles. While proponents of the "syntactic" approach claim that these primitives correspond directly to syntactic structures which in turn may be transformed, proponents of the "lexicalist" approach claim that these primitives correspond to argument structure configurations which may be manipulated, the output being syntactically projected. These approaches differ along the traditional lines of lexicalist vs. transformational approach on the level at which surface word order is determined. They do not differ, however, on the deep semantic/thematic principles which directly determine that word order. The similarity of these two different approaches is best manifest in the related concerns of these two approaches concerning such phenomena as the contrast in the projection of adjectival vs. verbal passives, cases of unaccusative mismatches, and finally, the causative/inchoative alternation depicted here.

An interesting argument often given in favor of the lexico-semantic approach deals with language acquisition (see Levin & Rappaport 1989; Pesetsky 1990). Unfortunately, this argument is rather hard to evaluate. Certainly, *prima facie* it would facilitate the task of acquisition considerably if meaning were trivially mapped onto structure. However, as pointed out by Wexler (1982) (and see also Borer & Wexler 1987), the mapping from meaning to structure faces non-trivial acquisition problems.

An interesting study by Landau & Gleitman (1986), (see also Gleitman 1991) further indicates that children deduce meaning on the basis of structure, and not the other way around, suggesting that even if lexico-semantic approaches to syntax are correct, they provide no help in acquisition. Further, note that the semantic distinctions involved are sometimes extremely subtle, and at any rate, much more subtle than syntactic cues. In assuming that these subtle semantic distinctions are so much easier for the child to perceive than syntactic structural ones, we are weakening substantially the claim that formal syntactic structures are innate and available to analyze incoming data. We further subscribe to the view that meaning is somehow "simple", while structure is somehow "complex", a view at best without foundation. Note further that for lexico-semantic considerations to be relevant in acquisition there must be a universal mapping from lexical semantics to syntax. It is not clear that such a claim is in fact tenable.<sup>22</sup>

And finally, an attempt to derive syntactic structures from lexico-semantic considerations gives rise to a conceptual query: in the evolution of language, as grammars undergo changes acquired by new native speakers, why do they not become increasingly more regular semantically? Why, in the range of over-generalizations and regularizations observed in children, are formal syntactic and morphological extensions common, and semantic ones almost entirely absent?

To conclude, without denying the need for a theory explaining the relations between syntax and lexical semantics, it appears obvious that any attempt to reduce the former to the latter is guilty of over-simplification, and is doomed to failure. I believe that any explanatory theory of these relations must maintain the independent status of syntactic and morphological formal primitives, and that any attempt to reduce them to vague lexico-semantic concepts is in serious error.

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22 The impossibility of such mapping is explicitly argued for in Rosen (1984). Some of her conclusions concerning American Indian languages have been reanalyzed recently by Martin (1991). Levin & Rappaport (1989), addressing her claim that verbs with similar meaning nevertheless project differently in the syntax, point out, correctly, that any claim for similarity in meaning must be dependent on a fully articulated theory of lexical semantics, and that such a theory is not currently available. Note, however, that in the absence of such a theory, it is equally difficult to evaluate claims that lexical semantics projects directly into fixed syntactic structures.

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