

DISTRIBUTED MORPHOLOGY WITHOUT SECONDARY EXPONENCE: A LOCAL ACCOUNT OF LICENSING THEMATIC LICENSING OF VOCABULARY ITEMS AND STRONG VERB ALTERNATIONS*

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This paper provides a Distributed Morphology (DM) approach to the thematic licensing of verbs and extends that approach to the licensing of strong verb alternations such as *eat/late*. These verbal behaviors have been captured in the DM literature by limiting the morphological environments that condition the insertion of Vocabulary Items (c.f. secondary exponence). In this paper, I show that the verbs in question gain the features of the environment they appear in by undergoing fusion with the relevant heads. In this way, DM does not need to rely upon conditioning the insertion of irregular verbs, but need only rely upon the Subset Principle to license the insertion of these verbs.

1.0 Introduction

This paper offers an alternate solution to thematic licensing and weak/strong verb alternations outside of the cumbersome mechanism of secondary exponence within the DM framework. As a framework within the Minimalist Program (Chomsky 1995) that captures the morphological structure in addition to the syntactic and semantic structures of utterances, Distributed Morphology (henceforth DM, Halle and Marantz 1993, 1994) is tasked with a number of phenomena that Lexicalist theories are not. The most evident is, of course, overt morphological structure. Perhaps the greatest difference between Lexicalist theories and DM is that the appearance of words in a derivation is “backwards” in DM. In lexicalist theories, a word, morphologically simple or complex, is generated in the lexicon. It then projects an x-bar schema. In DM, words are inserted into a fully-formed syntactic structure rather than projecting that structure. This difference leads to a number of issues that Lexicalist theories of syntax do not need to address that DM must. One such issue is that a Vocabulary Item (VI)¹ has

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¹ Vocabulary Items are the rough equivalent of a lexical item (or word) in DM.

to be *licensed* for insertion into a structure in DM contra Lexicalist theories, where the lexical entries are considered the *cause* for the structure they appear in.

In many instances, a VI is inserted directly into a node where the contents of the node and the requirements of the VI are in one-to-one correspondence: The process of insertion is entirely local to the node undergoing insertion. However, a number of phenomena appear to be inherently non-local. The machinery available to DM to capture local phenomena is well structured. Non-local phenomena, on the other hand, are captured by a number of different “conditioning environments” loosely called *secondary exponence*. A problem with secondary exponence, on top of the fact that it is inherently non-local, is that, within the framework, the types of conditions that are allowed to affect the licensing of a word within it are not strictly defined.² The purpose of this paper is to explore two phenomena—thematic licensing of verbs and their arguments (subcategorization) and the licensing of irregular forms over productive forms (e.g. strong/weak verb alternations)—which are normally captured with DM using secondary exponence. Rather than a standard analysis of these phenomena (Halle and Marantz 1993, 1994, Harley and Noyer 2000), I propose that the process of fusion, which turns a complex node into a simplex node, can be used to treat non-local relationships.

A tremendous amount of work has been done in syntactic theory on the very simple observation that English verbs tend to appear with a variety of different argument structures. (Grimshaw 1979 Chomsky 1981, Pesetsky 1995, Ramchand 1998, Baker 1988, and others). The majority of this work has come in the form of subcategorization (Grimshaw 1979), theta-grids, lexical readjustment rule, etc. Theories of these sorts aim to capture a number of different behaviors such as polysemy, whereby a single verb is found in a number of different syntactic and semantic environments.

A rather straightforward solution to this type of behavior is to stipulate that the argument-selecting behavior of verbs is variable. However, for most verbs, certain semantic or syntactic frames are not permitted.

- (1) a. Mary liked the play
b. #The play liked Mary .
- (2) a. The play pleased Mary
b. #Mary pleased the play (Ramchand 1998)

² This reflects the fact that secondary exponence captures the same behaviors attributed to the generative lexicon in traditional lexicalist frameworks, which themselves are not typically governed by any principles.

- (3) a. John put the paper on the shelf.
 b. *John put on the shelf
 c. *John put the paper.
 d. *John put. (Pesetsky 1995)
- (4) a. The ship arrived.
 b. *The captain arrived the ship.

To capture this behavior, work in syntactic theory has for the most part assumed that a word is specified in some way for the environments that it is licensed to appear in (Grimshaw 1979 and following). The scope of this type of analysis is not limited to a simple licensing of a verb in some contexts but not in others. Theories of licensing also must capture frame alternations such as the double object alternation.

- (5) a. Julie gave Ripley a bone.
 b. Julie gave a bone to Ripley.
- (6) a. Julie delivered the scratching post to Gimli.
 b. *Julie delivered Gimli the scratching post.
 c. Jack asked Julie a question
 d. *Jack asked a question to Julie.

Most of the work that has been done in this area of syntax and lexical semantics has been done within lexicalist models of syntax. As a result, much of this behavior has been captured by specifying a verb for the types and number of arguments that it takes in its lexical entry and then allowing for productive alterations of these specifications in a generative lexical component of the grammar.

This type of analysis is incompatible with late-insertion models such as DM because the concept of the lexicon in DM is different. In DM, the lexicon as a generative mechanism does not exist, *per se*. Rather, the work of the lexicon is distributed among many different modules within the syntax. Crucially, in lexicalist theories, since fully formed words are the atoms that are manipulated by the syntax, a verb can specify what types of elements it can be merged with and even project the structure it appears in. However, since words are inserted into a fully formed structure in DM, the words themselves cannot dictate the structure of the sentence. Rather the word must be licensed for insertion into some derivations but banned from insertion into others.

Harley and Noyer (2000) provide an analysis to capture the licensing of a VI into a set of possible structures. In their analysis, the insertion of a VI is licensed via secondary conditioning of that VI. Thus, each VI contains specifications that

must be met not by the node that it is to be inserted into but by the shell of projections above and below that node (7).

(7)	Phonology	Licensing environment
	a. <i>sink</i>	[±v],[+DP],[±cause]
	b. <i>big</i>	[−v],[+DP]
	c. <i>open</i>	[±v],[+DP],[±cause]
	d. <i>destroy</i>	[+v],[+DP],[+cause]
	e. <i>arrive</i>	[+v],[+DP],[−cause]
	f. <i>grow</i>	[+v],[+DP],[±cause]

The primary goal of this paper is to provide an analysis for the thematic licensing of verbs within the DM framework that captures the same behaviors that Harley and Noyer (2000) does but, in doing so, uses the local machinery of the Subset Principle (Halle 1997) and primary exponence of VIs. To this end, I propose that the root adjoins to functional heads that carry features like those described in (7) above. The complex head created by this adjunction is then subject to fusion, which results in one simplex node that carries both the features of the lexical head and the features of the functional head. A VI specified for both types of features can be inserted into the new simple node, allowing a VI to “mean” both lexical information and functional information. In this way, the structural information of the environment of a terminal node can be contained in the node itself. Insertion into that node can then be conditioned by the structural environments without a non-local licensing condition specified for in the VI.

Having shown that a local account can be used for a treatment of thematic licensing conditions, I will show that one can also be used for weak/strong verb alternations in English as well. I will argue that, in cases of words like *ate*, the tense head has fused with the lexical head, creating a node that is both specified for a root and for a tense feature. In this way, the VI to be inserted into such a node can also be specified for both types of features.

This behavior is typically accounted for in DM by secondary exponence— a.k.a. morphological conditioning effects (such as the presence of a [past] feature in the node above the verb). In such an analysis, the word *ate*, while meaning “the past tense of *eat*” does not actually realize the past tense. Rather, it is conditioned by the past tense. The past tense itself is realized by a null morpheme (or, rather, a VI without any phonological content). Many secondary exponence accounts of suppletive or non-productive paradigms end with the stipulation of these null morphemes and the assertion that (for example) so-called “past tense” forms of verbs do not actually carry the meaning “past tense” (see Halle and Marantz 1993 and following for analyses using morphological conditioning effects).

The analysis I present here will not make either of those somewhat counter-intuitive assumptions. Rather, I will show that irregular forms are indeed specified

for the morpheme they are conditioned by: Thus, they realize the feature that licenses their insertion. In addition to making this a local effect, this analysis drastically reduces the number of null morphemes necessitated by analyses of strong English forms.

1.1 Background Assumptions

The analysis that I propose here is in many ways at the crossroads of many separate pursuits within formal syntactic theory. In this section, I will quickly sketch a number of the proposals I will assume for this analysis. The first of these assumptions, following Chomsky's (1957) "autonomy of syntax principle", is that there is a difference between types of ill-formedness that are grammatical and the types that are Encyclopedic.

Across the literature, the ill-formedness of a sentence has historically been attributed to either one of two causes. Either the grammar prohibits such a construction or a construction runs contrary to our real world knowledge. In this paper, I will be assuming that some sentences are ill-formed because the grammar cannot produce them while others are ill-formed because they conflict with our real world knowledge. For example, (2b) *#Mary pleased the play* is ill-formed because it conflicts with our real world knowledge that plays are not things that are capable of being pleased. On the other hand, (4b) **The captain arrived the ship* is ill-formed because the grammar cannot produce it. This is evident because we know that in the real world things can be caused to arrive. Thus, the fact that the utterance is ill-formed conflicts with our real-world knowledge that the event described by the utterance is possible.

I assume that the ill-formedness of utterances such as (2b) need not be captured by a formal theory of the grammar as the grammar produces them. Rather, they are judged semantically anomalous by the mechanism responsible for interpretation (e.g. *Colorless green ideas sleep furiously*). However, a formal model of the grammar must be able to explain the unacceptability of sentences like (4b) because their unacceptability is a result of the grammar, despite their being interpretable.

Furthermore, as described above, this analysis is based upon the tenets of Distributed Morphology. Section 1.1 offers a very brief summary of the Distributed Morphology model of the grammar. I am primarily concerned with the compatibility of this analysis with a late insertionist model such as DM.

Next, I follow the work of Borer (1994), Jelinek (1998) and others who work in a Neo-Davidsonian framework wherein each argument is introduced into the structure by a functional head. Section 1.2 will offer a brief summary of the projection of arguments under this model.

Finally, I will be assuming the l-node hypothesis as put forth by Harley and Noyer (2000). Under this analysis, the syntax does not manipulate items of

category “noun” “verb”, or “adjective”, or any other “lexical” or “content” category. Rather there is only one type of “content” node, the l-node.³ Any categorial properties a node takes on are defined by the syntax, specifically by the presence of functional heads that give the node category.

1.1.1 Distributed Morphology

In lexicalist theories (see Chomsky 1970, 1981, 1995, Bresnan 1982 and following), words are formed in the lexicon then the syntax, uses those words as atoms to form sentences. The syntactic structure must satisfy requirements of each word that need to be met in order for the sentence to be grammatical. On the contrary, in DM, the syntax creates structures by manipulating only features. Vocabulary Items (VI) that realize these features are then inserted into the finished structure. This type of model allows features to be combined into complex nodes that can then be spelled out with complex morphology. Thus, all the work to create complex morphology (or any morphology at all, for that matter) is done by the syntax. This significantly simplifies the amount of machinery actually performing concatenative processes in the grammar down to just one “engine” doing all the work of the syntax and the morphology.

In DM, the lexicon does not exist in the traditional—generative—sense of the word, as there is no machinery other than the syntax. The syntax manipulates universal features, such as tense, number, and person, to create phrase structures. These features are then realized by the insertion of VIs, the phonological expressions that make up the sound meaning pairings, into nodes containing them. Unlike the lexicon in lexicalist theories, the Vocabulary does not contain any mechanisms for creating words. Rather, each VI realizes a set number of features. This set is the primary exponence of the VI. For example, the VI for the English verbal affix /-s/ realizes the features [3], [pres], and [sg].

(8)	[3] [sg] [pres]	=>	-s /z/
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Insertion of a VI into a terminal node is governed by the Subset Principle, whereby a VI is licensed for insertion as long as the node contains all the features specified for by the VI.

³ Note: Harley and Noyer (2000) stipulate that the name l-node has no real significance. It is named to contrast an f-node, which are “deterministically” realized as they contain only grammatical material. They give the l-node “rough implication” of “licensed”. (Harley and Noyer 2000 page 7). As it happens, since I am only discussing the insertion of lexical words, I will only be referring to l-nodes. As such, I will simply be calling them “nodes”.

(9) **Subset Principle:**

The phonological exponent of a Vocabulary item is inserted into a morpheme... if the item matches all or a subset of the grammatical features specified in the terminal [node]. Insertion does not take place if the Vocabulary item contains features not present in the morpheme. Where several Vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen. (Halle 1997, via Noyer FAQ)

The features specified for by the VI are only required to be a subset of the features of the terminal node. Thus if the node has more features than the VI represents, the VI can still be inserted as long as it is the VI that represents the greatest subset of the features in the node. Crucially, the VI cannot be specified for features that are not in the node; it *must* be a subset.

Once a VI has been inserted into a node, it discharges the features that it represents from the derivation, meaning the features themselves are removed from the derivation. Instead, the VI now realizes those features. Furthermore, it also discharges all the rest of the features in the node, in addition to the features that it directly represents. Once a VI is inserted into a node, all of the features that were in the node have been removed from the derivation, not only the ones that the VI itself represents. In order for the features of a single node to be realized by more than one morpheme, the node must undergo the morphological process of fission to divide the node into two different nodes. Similarly, in order for two different nodes to be realized by one VI, the two nodes must be fused into one node through the morphological process of fusion.

A VI may also be licensed for insertion by a secondary set of conditions in addition to the features that it realizes. These secondary conditions are called the secondary exponence of a VI. One example of secondary exponence is the morphological conditioning effects on the insertion of allomorphs. The VI *slep-* is preferred for insertion over the VI *sleep* only in environments containing the feature [past]. Crucially, *slep-* is itself not an exponent of the [past] feature. Rather, it is an exponent of a root node; *-t* is the exponent of the past tense. The insertion of *slep-* is conditioned by the presence of the [past] feature. This type of process, illustrated in (10), is called “morphological conditioning” of the insertion of a VI.

- (10) Morphological conditioning on the insertion of *slep-*
√SLEEP → *slep* / ____ [past]

These VIs, as illustrated above, introduce the phonological material. In this way, when a construction undergoes insertion, it gains the phonology required to be pronounced.

After insertion, the sentence, which now contains phonological annotation, is assessed for interpretation by the Encyclopedia. The Encyclopedia contains entries matching the VIs to the real-world knowledge of the word. These entries give interpretation to the VIs and are thus responsible for the *non-grammatical* features of the referent of the lexical word. The Encyclopedia plays no part in the construction of a derivation, nor does it serve any role in determining whether the derivation is well formed. Rather, it simply assesses the interpretability of the sentence.

1.1.2 The Projection of Arguments

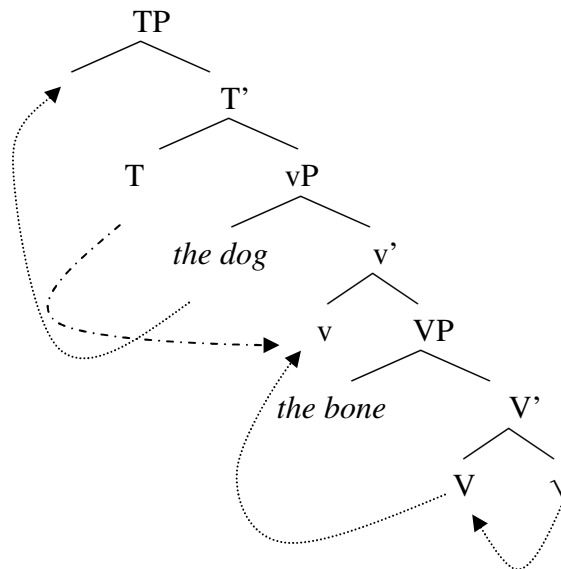
Marantz (1984), Larson (1994), Kratzer (1994, 1996) and many others have argued that agent arguments are not selected for by the verb. Rather, the agent argument is selected by a functional head called “light verb” (v) or VOICE that is generated above VP. Further work in event structure has shown the light verb head to be the locus of the meaning CAUSE (see Kratzer 1994, 1996, Ramchand 1997, Harley 1995, and related).

Following the “severing” of the external argument from the verb and Neo-Davidsonian event semantics, Borer (1994), Jelinek (1998), Ramchand (1997, 1998) and others have also endeavored to sever the theme argument from the verb as well. They have argued that the theme argument is also projected by a functional head. The name of this head varies from author to author (Jelinek 1998 calls it Trans, for example). To be consistent with the fact that the theme argument has historically been taken to be projected in VP, the head that projects a theme argument I will call V (“big-v”).

Since this functional head takes the root⁴ as its sister, the theme argument must be projected in spec position. Under such an analysis, the structure of a transitive sentence looks like (12) (shown before movement):

⁴ In line with the l-node hypothesis of Harley and Noyer (2000) as well as much of the other work done in DM, there is a critical difference between an f-morpheme and an l-morpheme. F-morphemes carry functional information and drive the construction of the sentence. L-morphemes on the other hand do not carry any features. They are later realized as lexical (or content) words. Since l-morphemes do not inherently belong to any category nor do they necessarily project a phrase structure, these morphemes are simply referred to as roots or with the symbol $\sqrt{}$.

(12) The dog ate the bone.⁵



As a matter of parsimony, we can also assume that all arguments including instrumentals, goals, experiencers, locatives, etc are projected by lexical heads that are merged above the root (Pesetsky 1995). I will be assuming this throughout the paper. For the purposes of this paper, I will give simple names to the argument heads that I show. The head that projects a dative object I will call G and the head that projects locatives I will call L.

2.0 Licensing, locality, and fusion.

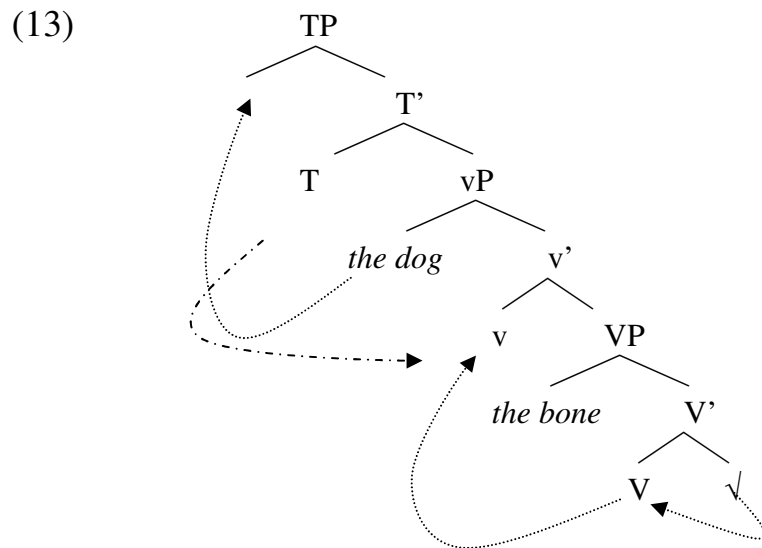
Under the tenets of the Minimalist Program, heads are said to carry (or be made of) features. In DM, these features are eventually realized by overt morphology. The clearest example in English is the head T, which carries tense features such as [past]. Functional heads that project arguments may also carry features that are spelled out by the morphology.

In this paper, I propose that all of the functional heads that project arguments carry features. These features bear the meaning of the theta role of the argument that the head licenses. For example, the version of “v” that licenses agent arguments carries the feature [v], which has the meaning CAUSE (Kratzer 1994, Ramchand 1997, 1998). The head that projects themes, V, carries the feature [V], which can be said to have a meaning roughly analogous to BECOME.

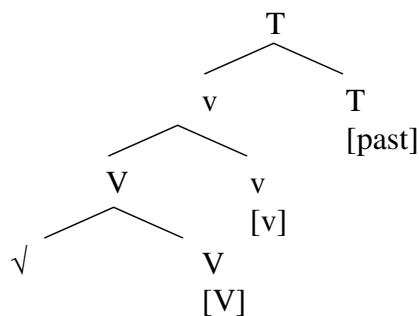
Like all other features, these “argument features” move up the tree through normal head movement. In the example above (12), the \checkmark moves to v through V.

⁵ The downward directed dashed line does not indicate syntactic movement. Rather, it indicates the morphological process proposed by Bobaljik (1994) whereby tense is merged with the verb under adjacency.

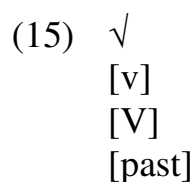
As it moves, the features of each head it passes through are added to \checkmark through head adjunction. Assuming a Bobaljik-style “merger under adjacency” analysis of the marking of tense on verbs in English (see Bobaljik 1994), this head movement and adjunction results in the complex head shown in (14).



(14) Complex head created by derivation in (13).



As discussed earlier, DM has a pair of processes whose purposes are either to split one syntactic node into two morphological positions of exponence or to cause many syntactic nodes to become one morphological position of exponence. The latter is called fusion. The process of fusion can be applied to the complex head created by the syntax in (14) to create the simplex head in (15).



This simplex node is now a candidate for vocabulary insertion and the discharge of its features by just one VI rather than the four that would have been necessary to discharge the features of the four different heads in the complex structure. Thus, VIs can be specified for these features just as they can be specified for any other features

Since the VI “ate” can be inserted into the node (15) in the sentence *The dog ate the bone*, it appears that the VI for *ate* is maximally specified for the features in that node. If it had any more features, insertion would be blocked.

(16) Vocabulary Item for *ate*

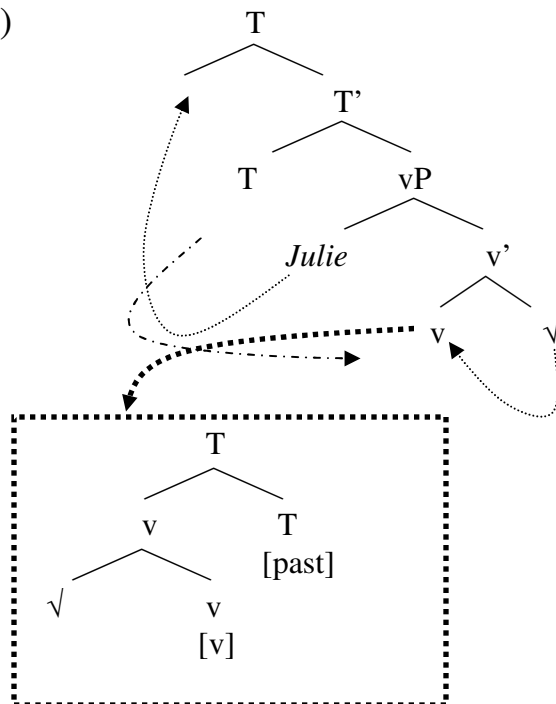
√	=>	<i>ate</i>
[v]		/ejt/
[V]		
[past]		

However, *ate* can appear in a derivation that does not have an object such as in sentences like (17)

(17) Julie ate.

If we assume a structure for (17) where the object is not base-generated rather than an elision account of the missing object, the structure for (17) is (18).

(18)



Inset: Complex head created by head movement and adjacency merger

b. fused head

√
[v]
[past]

In the structure in (18), we see that there is no [V] feature to be fused to the $\sqrt{\quad}$ node. It is clear then, since *ate* can still be inserted into the node that the VI for *ate* must not be specified for [V]. However, since *ate* cannot appear as an unaccusative or a zero-derived nominal, the VI for *ate* must be specified with the feature [v] for having an agent argument

- (19) a. *The sandwich ate. (where the sandwich is devoured)
b. *John did the ate.

So, the relevant features that the VI *ate* is minimally specified for are [past] and [v], which can be interpreted as the VI requiring that it a) realize a root, b) have an agent, and c) be past tense.

(20) Vocabulary Item for *ate*

$\sqrt{\quad}$	=>	<i>ate</i>
[v]		/ejt/
[past]		

The VI in (20) predicts that *ate* will be able to appear in any environment as long as the utterance is in the past tense and as long as there is an agent argument. The VI is indifferent to whether there is a theme present.

These predictions are different from the predictions made by lexicalist theories of subcategorization such as those proposed by Grimshaw (1979), Chomsky (1981), Pesetsky (1995), Ramchand (1997,1998), Baker (1988), and others in Lexicalist models. This model proposes that there is only one instantiation of a VI in the vocabulary for each “surface form” of a verb and that that VI will appear in a multitude of different environments as long as those environments include at least the minimum number of arguments. In this way, this is an underspecification analysis. Lexicalist analyses tend to include lexical entries that are fully specified for their arguments or that contain optional elements (see Woolford’s 1984 analysis).

However, within the DM analysis, the predictions of the Harley & Noyer (2000) analysis (21) can easily be made to make underspecification predictions in the same way that this analysis does if the optional elements that are marked as optional are instead treated as unspecified (22).

(21) Harley and Noyer (2000) licensing

Phonology	Licensing environment
a. <i>sink</i>	[±v] [+DP][±cause]
b. <i>big</i>	[−v] [+DP]
c. <i>open</i>	[±v] [+DP][±cause]
d. <i>destroy</i>	[+v] [+DP][+cause]
e. <i>arrive</i>	[+v] [+DP][−cause]
f. <i>grow</i>	[+v] [+DP][±cause]

(22) Harley and Noyer (2000) licensing adjusted to an underspecification analysis.

Phonology	Licensing environment
a. <i>sink</i>	[+DP]
b. <i>big</i>	[−v] [+DP] N/A
c. <i>open</i>	[+DP]
d. <i>destroy</i>	[+v] [+DP][+cause]
e. <i>arrive</i>	[+v] [+DP][−cause]
f. <i>grow</i>	[+v] [+DP]

The availability of an underspecification analysis is a benefit of the late-insertion aspect of DM. The subset principle dictates that VIs are often inserted into environments with more features than the VIs are specified for. Thus, VIs are already underspecified for the features they realize in the sense that they discharge all the features in a node, not only the ones they are specified for.

The aspect of this analysis that sets it apart from the Harley & Noyer (2000) analysis is not the predictions that it makes, but rather the locality of the effect that licenses insertion of the VI. Since the Harley & Noyer (2000) analysis uses secondary exponence, the constraints on insertion are inherently non-local: The VI must not only check the node for compatibility but also the rest of the VP shell. In the analysis I propose here, the VI only checks features in the node it is inserted into, a process that is more local than the Harley & Noyer (2000) process and is thus more economical. Further, it requires one fewer “operation” in the grammar and is thus more in line with Minimalist principles.

Having now sketched the fundamentals of the fusion-based account of thematic licensing of verbs, I will dedicate the rest of section 2 to the finer aspects of this analysis including what behaviors are predicted by this model and in what ways overgeneration is blocked. Since this framework relies heavily on the morphological process of fusion, in order for this account to accommodate any sort of derivational morphology, I must formalize a means for the fusion of all functional heads into the root node to be blocked. Otherwise, I would predict no

productive derivational verbal morphology in English. Section 3 discusses the morphological aspects of this analysis and investigates the ramifications of this framework on derivational morphology.

2.1 Evidence for the feature [v] in English

This analysis is critical of secondary exponence for involving a large number of null morphemes. Null morphemes are always suspect because, by their very nature, they are not pronounced, so we cannot really be sure that they are there. Similarly, the proposal here rests on the assumption that functional heads that select for arguments contain the features such as [V] and [G] that I propose above. Since the complex heads containing these features undergo fusion, the features themselves are realized by the same VI that realizes the root. Therefore, the features that I propose here are never realized by overt morphology⁶. Thus, the onus is on this analysis to provide evidence that these features exist.

The proof of these features, since they always fuse with the root, must be found by looking at a phenomenon where the number of arguments a verb appears with causes an alternation in the form of the verb itself. In this instance, the form of the verb that appears with more arguments is an instantiation of a VI that is more fully specified for the features I propose here. An example of such an alternation is the *rise/raise* alternation.⁷

- (23) a. My hand rose from the table.
b. I raised my hand off the table.

The form *rise* appears as an unergative while *raise* appears as a transitive verb. Under this analysis, the VI for *raise* must be specified for the [v] feature, requiring it to be inserted into a derivation with an agent argument. Since there is an alternation for transitivity here, this means that the VI for *rise* must not be specified for [v] (also evidenced by the fact that *rise* appears without an agent).

⁶ Heidi Harley, in her response to an earlier version of this paper suggests that [v] is often overtly realized by affixes such as *-ize*, *-ify*, etc. While I am very fond of such an analysis, I will take no official position here.

⁷ Thanks to Bob Kennedy to suggesting this example.

(24) Vocabulary Item for *rise*⁸

$\sqrt{\quad}$ => *rise*
[V] /rajz/

(25) Vocabulary Item for *raise*

$\sqrt{\quad}$ => *raise*
[v] /rejz/
[V]

Both VIs are linked to the same Fodorian concept, in this case $\sqrt{\text{RISE}}$. In this way, the alternation of *rise* and *raise* is treated as parallel to the alternation of *eat* and *ate*.⁹ Thus, the alternation of *rise* and *raise* can be taken to be evidence that the features I propose here do exist in the grammar of English, as the difference between the two words is the presence of the feature [v].

2.2 Rampant Polysemy

A strong prediction of this analysis is that a verb will be able to appear in any environment that has at least the minimum number and types of arguments that it is specified for. Since a VI such as *ate* is only specified for the features [v] and [past] it must be able to appear in any environment as long as an agent argument is present. This is the exact behavior this analysis sets forth to capture. In the paradigm in (26), we see the same root appear in a number of different semantic and thematic environments.

- | | | | | |
|------|----|-----------------|----|-------------------------------|
| (26) | a. | I run. | e. | I run Mary the paper |
| | b. | I run the race. | f. | I run the paper to Mary. |
| | c. | I run the dog. | g. | John went on the run |
| | d. | The water runs. | h. | John built a run for the dog. |

A lexicalist approach to this behavior would need to generate at least five different lexical entries for *run* based on syntactic structure alone. Acknowledging the fact that (26b) and (26c) have the same structure but the interpretations are slightly

⁸ Note that *rise* is not actually specified for [V] as it is shown. *Rise* not only appears as a zero-derived nominal, but it can also be argued that the intransitive forms it surfaces in can either be agentive (*I rose early from bed*) or non-agentive (*The X-wing rose from the swamp*). The VI is shown specified for [v] for purely illustrative reasons.

⁹ The *rise/raise* alternation can be captured by a morphological conditioning rule just as the *sleep/slept* alternation or the *eat/ate* alternation have historically been captured. However, this fusion-based analysis captures the existence of the [V] feature.

different, the number of lexical entries grows substantially. Excluding the possibility of a transformation within the lexicon for the double object construction or a Woolford (1984) style optional theta-grid, a strong lexicalist theory needs to generate eight different lexical entries to capture the above behavior, each with its own s-selection and linking.

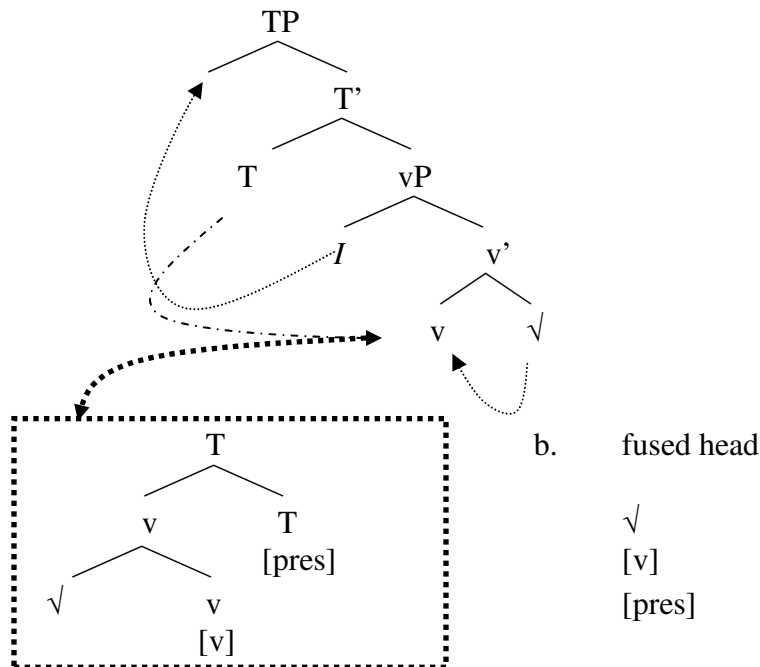
However, an underspecified analysis of this behavior as proposed here captures this behavior with just one VI.

(27) Vocabulary Item for *run*

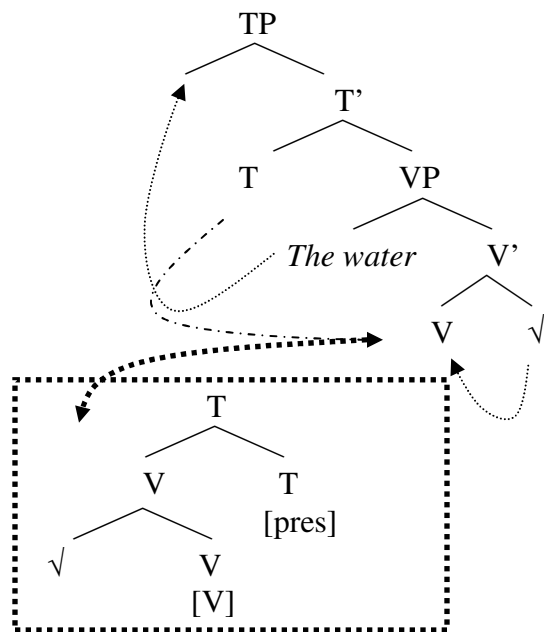
$\sqrt{\quad} \Rightarrow \text{run}$
 $\quad \quad \quad /r\Delta n/$

This VI can be inserted into any of the structures in (26) as its requirements, a root only, are a subset of the features of the fused nodes in all eight derivations, including the zero derived nominals in (26g) and (26h) as illustrated in (28-31).

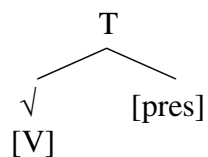
(28) a. I run.



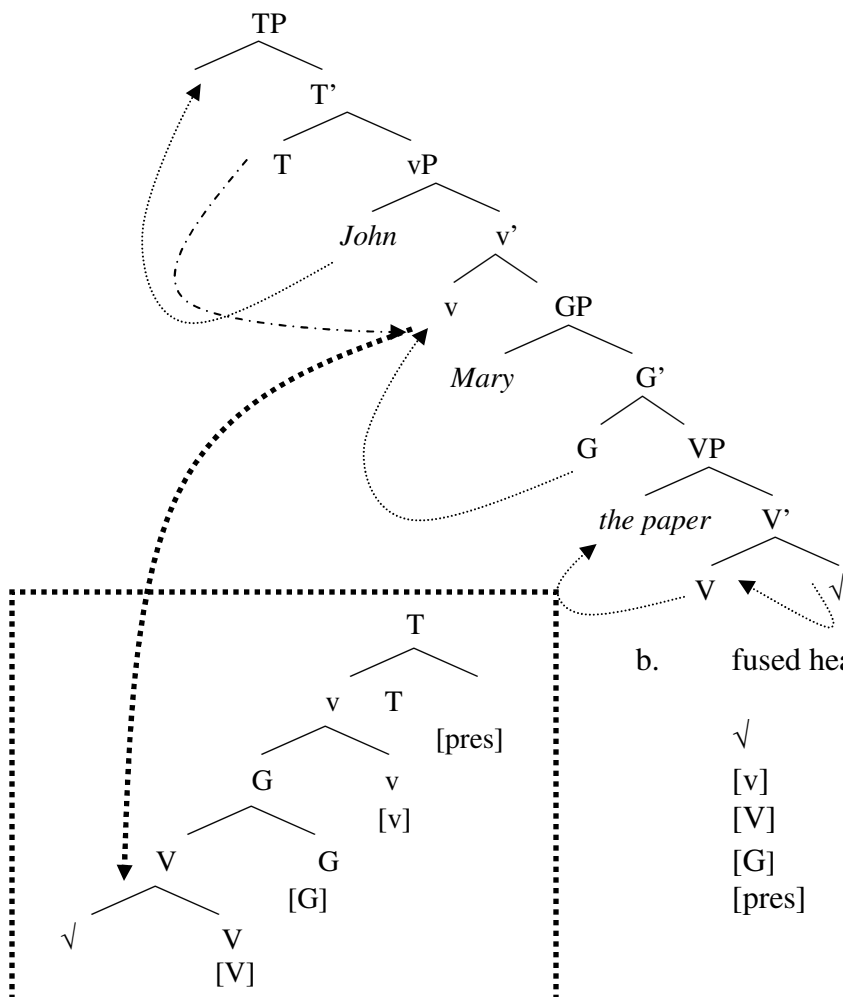
(29) a. The water runs.



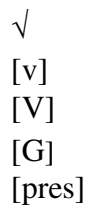
b. fused head



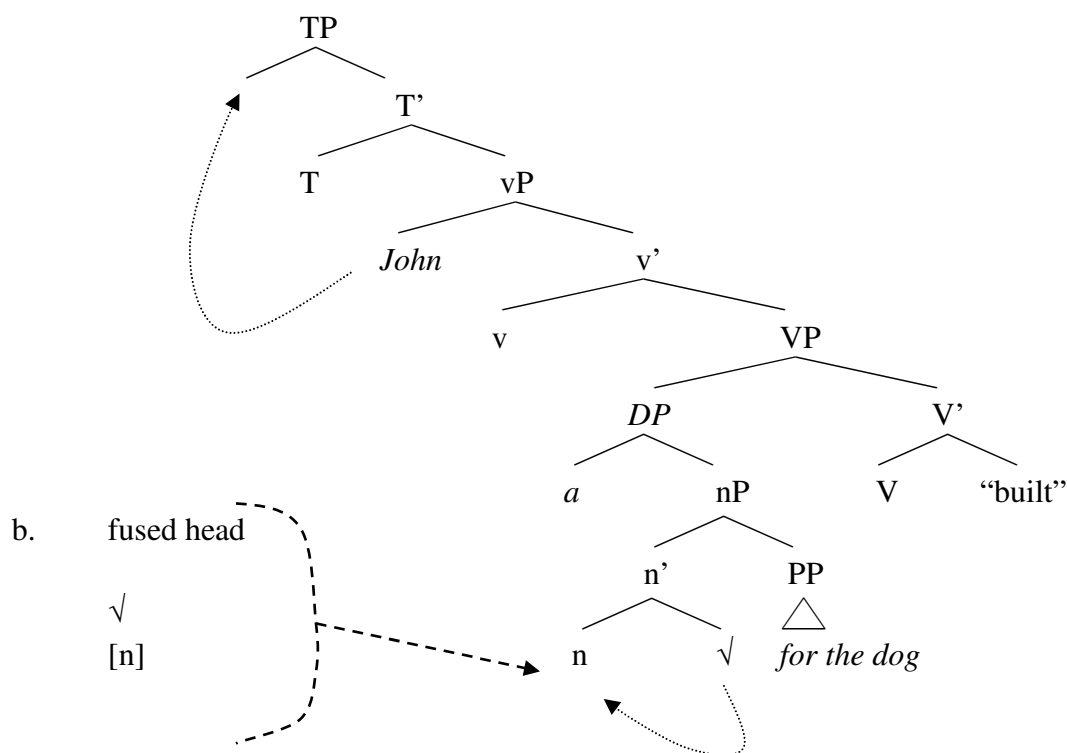
(30) a. I run Mary the paper



b. fused head



- (31) a. John built a run for the dog.



Lexicalist theories are often dependent on rigid s-selectional or thematic properties of lexical entries. When a verb behaves the way that *run* does above, a lexical theory of this sort is forced into the precarious prediction: They are committed to the existence of a vast number of lexical entries which are mostly synonymous (i.e. linked to the same Fodorian concept) and completely homophonous. These “homonyms” differ only by the syntactic environments they are licensed for. The underspecification analysis of a verb’s licensing conditions that is presented in this paper captures why verbs appear to be polysemous without asserting a lexicon full of homonyms.

The argument here is that there is only one *run* and that its variable behavior is a result of the underspecification of its licensing. Halle (1997) sketches a number of reasons why a model of the lexical storage module of the grammar should have economy constraints on it and why that would entail minimizing the number of homonyms. This paper does not have the scope to adequately discuss such a constraint. Rather, I will assert that Occam’s razor mandates that an analysis that shows two words that sound the same and mean the same thing to be two instantiations of the same word is preferred over an analysis that demands that they must be different words that are only coincidentally identical.

2.3 Structural Coercion

The crux of this proposal is that roots are underspecified for the environment in which they can appear. It follows that structures will be produced by the grammar in which a root appears with more arguments than it normally does. A root may even appear in an environment that our real world knowledge is not compatible with. For example, the utterance #*The ham sandwich ate Ripley* is produced grammatically by the syntax. However, the Encyclopedia marks this sentence as ill-formed because ham sandwiches do not make good eaters. However, we can adjust our real world knowledge to fit the sentence by interpreting *ham sandwich* in such a way that a ham sandwich is somehow capable of eating a person.¹⁰ We can also adjust the meaning of *eat* rather than the meaning of its arguments. This is of course how we get sentences such as *Fast forward eats the tape*.

A verb that appears with “extra” arguments that are “incompatible” with our real world knowledge force us to coerce our real-world-knowledge to fit the utterance, especially if as listeners we are to assume that the speaker strictly adheres to Grice’s maxims. In this way, when we are presented a sentence such as (32), we are able to interpret it.

(32) #John thought the book to Mary.

Glietman et al. (1990, 1996, also Lidz 1998) claim the interpretation of this sentence to be something like: John, using telekinesis moved the book to Mary, or John memorized and, using telepathy, transferred the contents of the book to Mary. We find this type of structural coercion in abundance throughout science fiction and fantasy literature wherein the authors already have the readers coercing their real-world knowledge.¹¹

Not only does such a framework for licensing account for structural coercion, it predicts it. For example, since *thought* typically appears in unergative structures (or in CP complement transitive structures) we can preliminarily assume that the VI for *thought* is specified only for [v] (and the past tense).

¹⁰ Another interpretation of this sentence is that “the ham sandwich” refers to something in some way associated with a ham sandwich, like the person who ordered it.

¹¹ My favorite example of this comes from Eric Nylund’s *The Fall of Reach* in which he constantly refers to planets having been “glassed”. Crucially, he never explains what this means but instead lets the reader coerce a meaning of *glass* that is compatible with interstellar warfare.

(33) Vocabulary Item for *thought*

√	=>	<i>thought</i>
[v]		/θat/
[past]		

Since *thought* is so underspecified, it easily appears in an environment that is specified more fully for arguments, such as the environment in *#John thought the book to Mary*. In that environment, the fused node that the VI would be inserted into (34) is a superset of the features the VI contains.

(34) *#John thought the book to Mary*

fused node

√
[v]
[V]
[L]

2.4 Blocking Overgeneration

As I have set this proposal out so far, it is apparently too strong. It claims that any verb can appear with any number of arguments beyond its minimum, as shown by *run* in section 2.2. However, there are verbs that are ungrammatical in the specific constructions where they appear with more arguments than its “default” conditions (35).

- (35) a. The ship arrived.
b. *The captain arrived the ship.
c. Ripley fell down the stairs.
d. *Julie fell Ripley down the stairs.

In (35b), the “extra” agent argument is blocked for *arrive*. What is necessary, then, is to design a mechanism within the framework of Distributed Morphology to block the insertion of VIs into nodes that they otherwise qualify for. Such a mechanism is not only necessary to capture the type of ungrammaticality in (35), it is necessary to block insertion where it is otherwise licensed. One such example where it is necessary is blocking *am* from *n’t* constructions (**amn’t*) but still allowing all other persons and numbers.

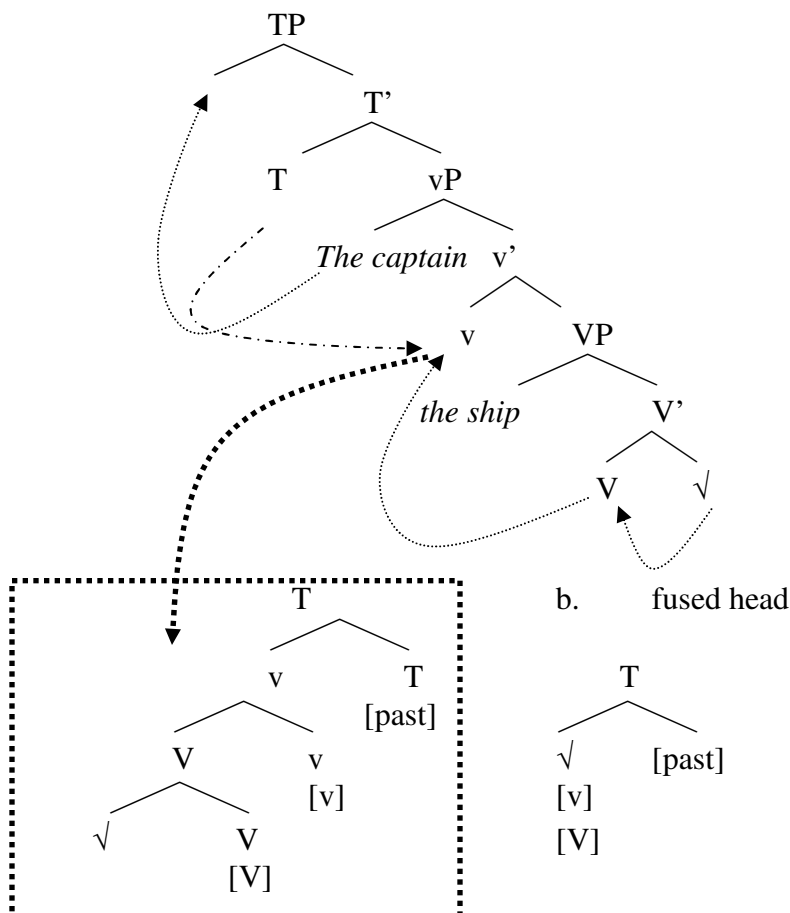
I propose that a VI can be specified for the features it *cannot* realize as well as the features that it does realize. As an example, the VI for *arrive* would be specified for being permitted in the environment of [V] but prohibited from the environment of [v] (36).

(36) Vocabulary Item for *arrive*

$\sqrt{}$	\Rightarrow	arrive
$\neg [v]$		/ərajv/
[V]		

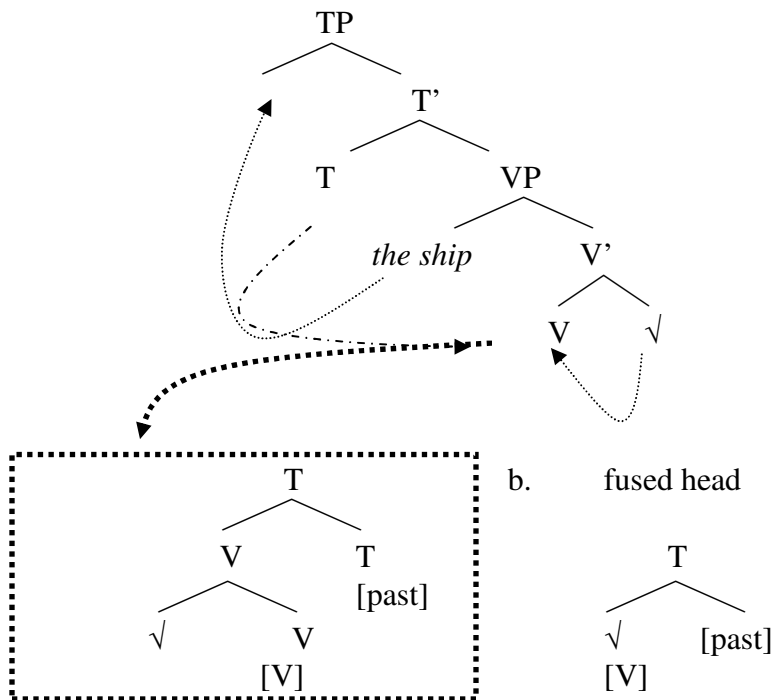
A VI specified in this way would be blocked from insertion into the derivation of **The captain arrived the ship* because the $\neg [v]$ it is specified for is not compatible with the [v] in the fused head it is inserted into in (37).

(37) a. *The captain arrived the ship.



Of course, the VI for *arrive* in (36) is compatible with a derivation that does not include a little *v*. Thus, *arrive* is easily inserted into a derivation such as *The ship arrived* (38).

(38) a. The ship arrived.



A VI specified in this way captures the grammatical incompatibility of *arrive* with the light verb. Crucially, there is no claim in this formalization that the meaning of *arrive* is incompatible with the meaning CAUSE. We know that the meaning of *arrive* is compatible with the meaning of CAUSE because things in the real world seldom arrive without some sort of external causation. This type of blocking shows the ill-formedness of **The captain arrived the ship* to be purely grammatical. In this way, the model proposed here presents an elegant account for the blocking of a verb into particular environments.

2.5 Dative alternation

One of the more difficult alternations that subcategorization theories have tried to capture is the dative alternation.

- (39) a. Julie gave Ripley a bone.
b. Julie gave a bone to Ripley.
c. Julie delivered the scratching post to Gimli.
d. *Julie delivered Gilmi the scratching post.
e. Jack asked Julie a question
f. *Jack asked a question to Julie.

Following Harley (1995), rather than assuming that a goal argument is present in both the “to dative” construction and the double object construction, I assume that, in each construction, there is actually a different argument and a thus a different head that projects it. The “to dative” is actually a locative argument projected by the L head which carries the feature [L]. It has the rough meaning of LOCATION.

The fact that the “to dative” corresponds to location rather than goal arguments is exemplified by the word *sent* (40).

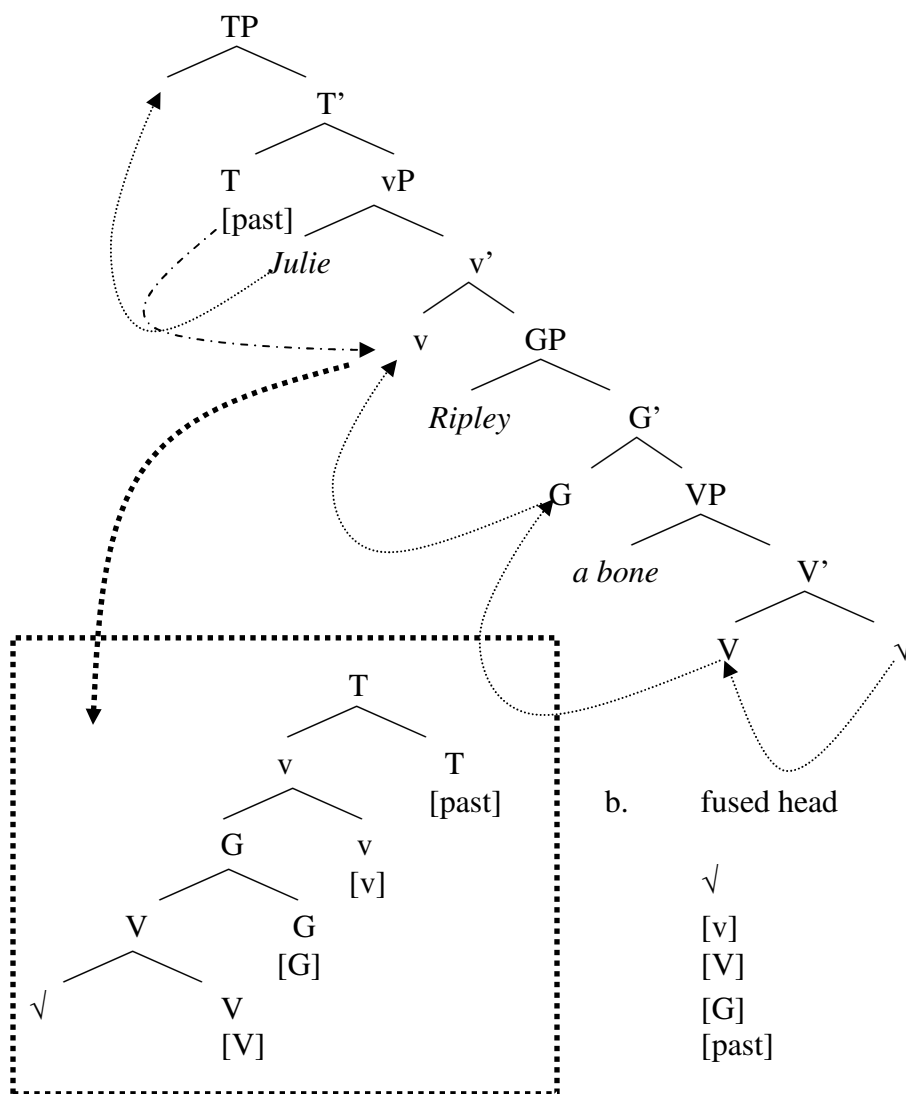
- (40) a. Jack sent Julie a message.
b. Jack sent a message to Julie.

When a person is the DP in the locatum/goal alternation such as in (44a&b), the interpretations of both sentences are so close that they give rise to the intuition that the sentences are related. However, if the locatum/goal DP in the alternation is a place rather than a person as seen in (41), it becomes clear that there are two different roles being associated with the positions because only one of the structures is permitted. This shows that they are not the same argument: a person is a “good” goal and a “good” location. A place, however, is not a good goal, only a good location (Harley 1995).

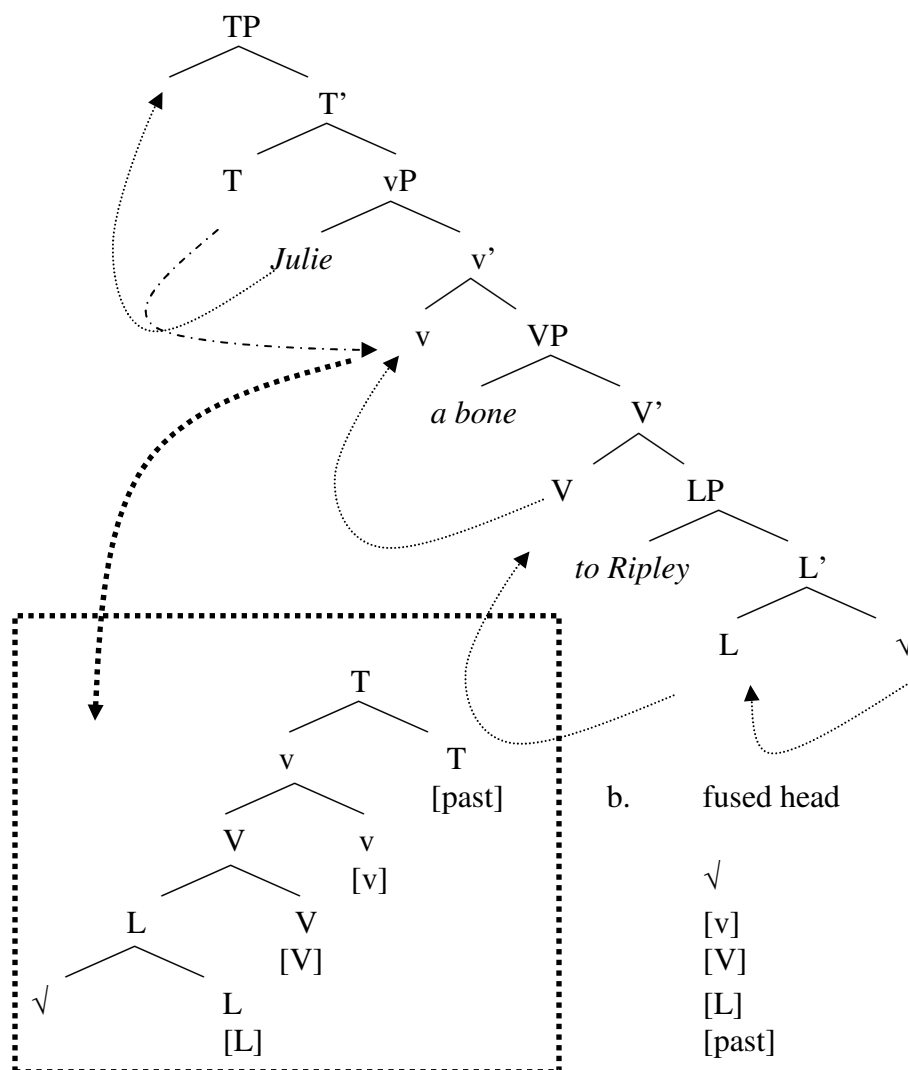
- (41) a. Julie sent the package to France
b. #Julie sent France a package.

In the derivations above, I have been calling the head that projects the goal argument G and its corresponding feature [G]. I will continue that practice here, differentiating it from the locative, which I call L. With the assumption of two different heads comes two different derivations for the locative (43) and the dative (42), resulting in two different fused heads that are subject to VI insertion as illustrated below.

(42) Julie gave Ripley a bone.



(43) Julie gave a bone to Ripley.



This type of analysis of dative constructions allows us to make generalizations about the specifications for VIs of different classes of verbs. For example, words like *deliver* and *donate* allow locatives and themes optionally but strictly prohibit goals. Such a class of verbs would have a VI such as in (44).

(44) Vocabulary Item for *deliver*

$\sqrt{\quad}$ \Rightarrow deliver
 [v] /dəlɪvr/
 \neg [G]

Such a VI allows insertion into a derivation with or without a locative argument and with or without a theme, but expressly bans its insertion into a derivation with a goal argument.

- (45) a. John delivered the pizza.
 b. John delivered the pizza to Mary.
 c. *John delivered Mary the pizza.
 d. John hasn't delivered to Mary yet.

Similarly, the class of verbs that behaves like *ask* would be underspecified for most arguments but blocked in the case of [L]. Verbs such as *give* and *run* would be truly underspecified in terms of L and G. In such a way, an underspecification approach to dative alterations that captures the major classes of verbs with respect to dative shift.¹²

3.0 Overt Tense Morphology

Much of this paper has revolved around insertion of zero-derived morphemes into a multitude of different environments. However, the net effect of section 2 is to give the appearance that this framework overpredicts the amount of zero-morphology in English. Obviously, while there is a great deal of zero morphology in English, it is not the norm. In this section, I will offer a brief account of overt morphology in this framework.

Now that we have established a way to block insertion of a VI into nodes that have fused with the verbal heads (section 2.4), it can be assumed that the same tactic can be used to block the insertion of a VI into any relevant fused head. In this way, we can capture overt derivation and the difference between weak and strong verbs.

A secondary exponence treatment without fusion of strong verbs requires a circular type of conditions. For example, the strong past form *ate* is licensed only in the environment of a tense head with the feature [past]. That T head is not

¹² Dative alternations are by far more complicated than what is presented here. The analysis above is just a cursory look at the ramifications of this analysis on dative alternations. Under this analysis, word classes like *fed* are a bit of a nightmare:

- i. a. John fed the ducks.
 b. John fed some peanuts to the ducks.
 c. John fed the ducks some peanuts.
 d. *John fed to the ducks.
 e. *John fed some peanuts.
 f. John fed. (Woolford 1984)

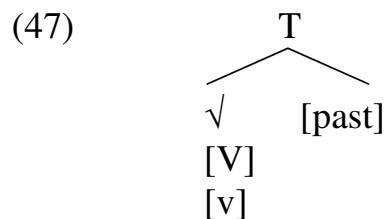
Under my analysis, anything that is *sometimes* optional must *always* be optional. As (i.d&e) show this is not always true. These types of idiosyncrasies for particular narrow classes of verbs are left up to further research on this project.

morphologically realized as *-ed*, the default in English. Rather it must be realized as a null morpheme, a change that is conditioned by the word *ate*. Thus, the realization of the $\sqrt{}$ is dependent on T and the realization of the T is dependent on the realization of the $\sqrt{}$. A fusion analysis is much more straightforward. In this analysis, *ate* is a realization of both the past tense and the root.

However, the default for English is for the tense morpheme to be overtly spelled out. Under the theory above, as a VI can be inserted into a node that is more specified than the VI itself. As I have shown the tense head to fuse with the root node, there seems to be the prediction that there would be no overt tense realization in English, at least under conditions of adjacency to the light verb. Of course, such a prediction is false (46).

(46) The dog devoured the bone.

As the tense is overtly spelled out here, it must be assumed that the tense head has failed to fuse with the rest of the complex root node. Thus the head that *devour* is inserted into is only partially fused, with the tense spelled out as *-ed*.



Since this framework asserts rampant fusion throughout most complex nodes, it also predicts that whatever features are fused with the root will not appear in the morphology of a word. Thus, in order for a (weak) root to appear with overt morphology, something must block the insertion of a weak VI into a fully fused node but allow it into a semi-fused node. For example, I have been showing a difference between the fully-fused past tense node that strong verbs are licensed in and the semi-fused nodes that weak verbs can only fully discharge with the help of overt morphology (48).

- (48) a. fused head for “weak” verbs b. fused head for “strong” verbs



To prevent a weak verb from being inserted into a derivation that licenses a strong verb as seen above, we can assume that weak verbs are blocked from being inserted into nodes with the appropriate tense features. A typical weak verb in Standard English will be blocked from a node containing past tense, progressive aspect, or third-person singular. Thus, a typical “weak” VI may look like (49).¹⁴

- (49) Vocabulary Item for *deliver*

$\sqrt{\quad}$ => deliver
 [v] /dəlɪvɜː/
 ¬ [G]
 ¬ [past]
 ¬ [prog]
 ¬ [3sg]

A similar treatment can account for the difference between roots that allow zero derivation between lexical “classes” like *hammer*, *blue*, *throw* etc. and those words that show overt derivational morphology when changing classes. For example, *fuse* surfaces as *fusion* when it is a nominal.

- (50). a. Doc Ock fused the atoms.
 b. The *fuse of the atoms was complete.
 c. The fusion of the atoms was complete.

The overt nominal derivation of *fusion* is captured by a VI such as that in (51).

¹⁴ The proposal I have here runs into a strange paradox. In order to block the insertion of *deliver* into any derivation where particular tenses, aspects, or agreement features have fused with the root, the VI for *deliver* must be heavily specified for where it *cannot* be inserted. However, the form in (51) represents the least marked form of *deliver*, or its default form or elsewhere variant. In most linguistic theories (including standard views of DM), the elsewhere variant is taken to be the least specified for the environments it can appear in. While this is strictly true in the framework I have described here, it is also true that elsewhere variants also have the dubious property of being the *most fully specified* allomorph for the conditions in which they *cannot* appear. I am unsure that this paradox is anything other than counter-intuitive and not really a fault of the grammar.

(51) Vocabulary Item for *fuse*

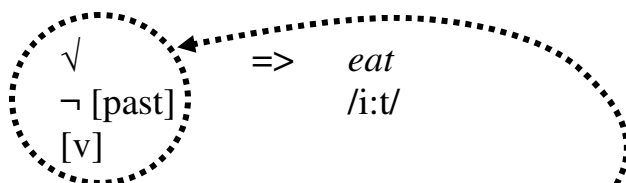
$$\begin{array}{lcl} \sqrt{} & \Rightarrow & \text{fuse} \\ \neg [\text{n}] & & /fjuz/ \end{array}$$

Such a VI as that in (51) will be blocked from insertion into a node where the nominalizing head has fused with the root, but will be allowed in a derivation where those two nodes have failed to fuse. Thus, the [n] feature will be spelled out as *-ion*.

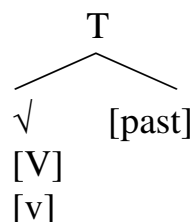
3.1 Blocking **eaten*, but permitting *devoured*.

As laid out now, the framework I propose overgenerates: To stop a weak verb from being inserted into the same node that a strong verb is inserted into, I propose that strong verbs are inserted into nodes where the tense has fused with the rest of the root. Weak verbs are then blocked from these nodes. The problem with this analysis is that the unmarked version of a strong verb such as *eat* cannot be blocked from being inserted into the unfused complex node. This predicts that strong verbs should also appear as weak verbs: We should have both *ate* and **eaten*.

(52) Vocabulary Item for *eat*

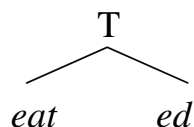


Node with unfused tense.



specifications of VI for *eat*
compatible with unfused
derivation

(53) Resulting node after insertion.



Rather than blocking the insertion of a strong verb into an unfused node, I instead propose an economy constraint that requires that complex nodes be fuse if there is a VI that can be inserted into such a node. Such a constraint would select the derivation with the simplest and smallest number of complex nodes as the most well-formed.

(54) INFLECT: Realize morphemes with the smallest number of Vocabulary Items.

Essentially, such a constraint on the grammar causes the grammar to prefer fused nodes over complex nodes. This, of course, leads to the preference of a fully-fused (“strong”) node over a semi-fused (“weak”) node (see 55). This will give a preference of *ate* over **eated*.

(55) a. fused head for “weak” verbs b. fused head for “strong” verbs



However, this leads to another problem with the grammar. A grammar with the constraint such as INFLECT will block regular forms of irregular verbs (such as *ate* over **eated*), it will also block **any** weak verb in favor of a strong verb. Thus, *delivered* could never surface as the derivation with the strong verb *ate* better satisfies the economy constraint.¹⁵

The solution to this problem comes from the work of Roland Pfau. In his dissertation (2000), Pfau argues that DM would work better as a performance model of the grammar if specific roots whose meanings correspond to Fodor-style concepts (e.g. √DELIVER) instead of generic roots (√) were numerated for the

¹⁵ Assuming that *deliver* and *ate* have all other features other than the presence of [past] in common.

syntax module. In such a model of the syntax, “lexical” VI’s would be specified for specific roots rather than *any* root (see discussion of generic roots above).

(56) Examples of Vocabulary Items in a Pfau-style DM grammar.¹⁶

√DELIVER	=>	deliver
[v]		/dəlɪvr/
¬ [past]		
√EAT	=>	ate
[v]		/ejt/
[past]		

In a Pfau-style grammar, *delivered* is no longer in competition with *ate* as *delivered* is only licensed in a derivation with the root √DELIVER and *ate* is only licensed in a derivation with the root √EAT (see 56 above). However, *ate* still competes with, and thus blocks, **eated* as they are both linked to the root √EAT.

The combination of the economy constraint INFLECT and Pfau-style numeration allows for the grammar to block regular forms of irregular verbs but still allow regular forms to surface.¹⁷

4.0 Conclusions

The primary purpose of this paper has been to show that thematic licensing of verbs can be captured within the DM framework as a local process. The only other existing analysis of thematic licensing within the DM framework, Harley & Noyer (2000) captured this using a set of conditions that must be met by the environment surrounding a terminal node in order for the VI to be inserted. The analysis I propose here is critically different because it captures licensing as constraints on the kinds of features a node can contain and have a particular VI inserted into it. This type of analysis has a theoretical advantage over the Harley & Noyer type of analysis: It uses the subset principle and primary exponence as the mechanism for licensing this type of insertion. Primary exponence is governed by the subset principle and is well motivated as the main mechanism for insertion in DM. Thus, an analysis that uses primary exponence is strictly preferred over an analysis that relies on secondary exponence because the processes involved in and the

¹⁶ Only the relevant features are shown.

¹⁷ Of note is the fact that Pfau-style numeration is necessary for this analysis even without the economy constraint INFLECT. Otherwise, the Subset Principle would mandate that *eat* always be preferred over *run* as it is more highly specified. Similarly, *deliver* would be preferred over *eat*, *put* over *deliver*, and so on.

functionality of secondary exponence are not as well formalized. Further, any analysis that relies on secondary exponence is inherently less local than an analysis that uses primary exponence. Under the Minimalist principles, locality is to be preferred when available.

A secondary effect of this paper was to provide a fusion-based analysis of weak/strong verb differences and zero morphology. The analysis presented here accounted for irregular verbs and zero-morphology without the use of morphological conditioning effects. As a result, I make two main predictions that are preferable to those made by the traditional approach to such phenomena within DM. The first crucial difference is that this analysis requires a vastly smaller number of null morphemes than a conditioning analysis does. Secondly, this analysis proposes that a suppletive or irregular form like *ate* realizes both the root and the functional morpheme (past tense in this case).

The effects of this analysis show the inherent benefits to an analysis that uses primary exponence over secondary exponence. That being the case, this paper sheds light on a larger question: Can secondary exponence, including morphological conditioning, readjustment rules, etc. be removed from Distributed Morphology entirely? Further work using fusion and feature blocking that I have laid out here may reveal that it can be.

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