

ROOTS AND THE DERIVATION*

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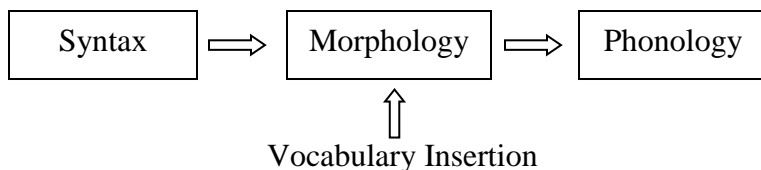
Abstract

Contrary to recent work in Distributed Morphology adopting Early Root Insertion (the notion that Roots are present from the outset of the syntactic derivation), we argue that Late Insertion applies to Roots just like other morphemes. We support this conclusion with empirical evidence (Root suppletion and hyponymous direct objects in noun incorporation and related constructions) and conceptual considerations (including the beneficial obviation of readjustment operations and the possibility that narrow syntax is universal). Additional data (Latin semi-deponent verbs) allow us to re-cast Embick's (2000) licensing analysis of Latin deponent verbs as a further argument for Late Root Insertion.

1. Introduction

The earliest work in Distributed Morphology (DM) crucially assumed *Late Insertion* for all Vocabulary Items, or VIs (cf. Halle & Marantz 1993, 1994; Harley & Noyer 1999; and much other work). This entails that morphemes, construed as abstract syntactico-semantic features, are not attached to their phonological exponents until Vocabulary Insertion, which is presumed to occur at the level of morphological structure *after* the syntactic derivation occurs. This model can be schematized as such:

(1) The Architecture of the Grammar in DM



While the initial proposals for DM by Halle and Marantz (1993, 1994) just assumed this

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to be true for Roots as well as for inflectional and other functional affixes, this stance was not laid out explicitly until Marantz's (1995) "A Late Note on Late Insertion". In that paper Marantz argued for Late Root Insertion along several lines, including the following: (i.) that phonological features are irrelevant to the syntax, being "at best superfluous" and at worst a violation of Minimalist tenets, having to be ignored or deleted at LF (p. 396); (ii.) that the idiosyncratic meaning differences between specific Roots (e.g. $\sqrt{\text{CAT}}$ vs. $\sqrt{\text{OCELOT}}$) are also irrelevant to the syntax (with Marantz claiming that the semantic difference between Roots is indexical, in parallel to the interpretation of deictics);¹ and (iii.) that the architecture of DM does not allow idiosyncratic syntactic or semantic compositionality with Vocabulary Items (or idioms, or...). This last point entails that "words" are restricted to the same operations as are available in the syntax (e.g. "agent-incorporation" should not be possible "in the Lexicon" if it is forbidden in the syntax). The above considerations led Marantz (1995) to conclude that the Vocabulary "is the output of a grammatical derivation, not the input to the computational system" (p. 411), and, accordingly, that Roots were subject to Late Insertion just like functional morphemes.

A recent alternative view within DM theorizing, though, rejects Late Insertion for Roots in favor of what we will call *Early Root Insertion*, i.e. the idea that Late Insertion applies to functional (inflectional, derivational) morphemes only. Roots, in this alternative view, are attached to their full range of features, including their phonological forms, throughout the syntactic derivation. This position is introduced in Embick (2000) and promoted in such work as Embick & Halle (2005) and Embick & Noyer (2007). It is our purpose in this paper to show that the abandonment of Late Insertion for Roots in DM is problematic for a variety of reasons, and we will argue that the original vision of Late Root Insertion should be upheld within the theory

¹ Similarly, Harley & Noyer (2000) provide a licensing account of argument selection in DM where the syntax is blind to the semantic difference between specific Roots.

after all, at least as far as concerns the morphophonological forms of Roots (i.e. the spelled-out morphemic exponents referred to as Vocabulary Items). Although our remarks here are offered as a response to Embick (2000) (and the subsequent work that assumes Early Root Insertion following the argumentation given in Embick 2000), the discussion here of course applies to theories and models of morphology besides DM.

These remarks are structured as follows. In section 2 we add new arguments to those provided by Marantz (1995) which we think bolster the Late Root Insertion position for DM. These arguments come from empirical domains including Root suppletion (§2.1) and hyponymous direct objects in noun incorporation constructions (§2.3), as well as conceptual considerations including the desirability of obviating readjustment rules (§2.2) and the non-universality of Root morphemes (§2.4). Our discussion would lose much of its luster in the face of strong arguments necessitating the adoption of Early Root Insertion. We therefore re-visit in section 3 one of the primary sources serving as an impetus for the Early Root Insertion view, i.e. Embick 2000’s analysis of deponent verbs in Latin. Taking into account additional facts from Latin morphosyntax (specifically, those involving the class of semi-deponent verbs), we advocate an alternative analysis which was originally suggested, but ultimately rejected, by Embick himself. This alternative analysis obviates any need for Early Root Insertion for Latin. Section 4 concludes.

2. Additional Arguments for Late Root Insertion in DM

2.1. Empirical considerations I — Root suppletion

One major argument for Early Root Insertion is the supposed universal ban on *Root suppletion*.²

² We define Root suppletion as morphologically-conditioned stem allomorphy where the conditioned form has little or no phonological identity with the default form. Suppletion is often divided into two classes, “weak” and “strong”

This typological argument derives from such work as Marantz (1997) and Harley and Noyer (1999, 2000), who argue that the mutual exclusivity constraint on language acquisition prohibits Root suppletion. In brief, a language learner must assume that there is no synonymy in order to make the task of acquiring words possible. The effect of this is that two Roots with disparate phonology cannot be tied to the same concept. Given these assumptions, therefore, suppletion must be limited to “functional” material.

In DM suppletion is presumed to involve the insertion of different VIs to spell out some abstract morpheme. Under standard views, VI-insertion in DM is dependent upon competition (the Subset Principle, etc.). Suppletion is considered a special case of contextual allomorphy, where the phonological realization of functional morphemes can be dependent upon the morphological environment for their insertion: e.g. in English, for a [past] feature on T° certain Roots can take specific “irregular” suffixes (e.g. *-t*, *-Ø*, etc., in lieu of default *-ed*), while [plural] in Num° can be spelled out with special suffixes depending on Root classes (e.g. *-i*, *-en*, *-Ø*, etc., with *-s* being the default, or “elsewhere”, suffix), etc.

That this kind of contextual allomorphy should be unavailable for Roots is a crucial component of Embick & Halle’s (2005) presentation of the DM framework. As they put it,

[w]e note that Vocabulary Insertion only applies to abstract morphemes; Roots are not subject to insertion. A consequence of this view is that it is not possible for Roots to show *suppletion*. (2005: 5-6, emphasis in original)

They go on to state:

(or similar terminology), which are differentiable on the degree to which the allomorphs for a given grammatical category are phonologically similar. Whereas some stem alternations show minimal alterations and have much in common phonologically (e.g. *sing* ~ *sang* ~ *sung*; *foot* ~ *feet*, etc.), other cases show little in common phonologically (e.g. *go* ~ *went*; *bad* ~ *worse*, etc.). Some commentators regard only the latter class as “true suppletion” and relegate the former to “pseudo-suppletion” or some such, but we find this categorization to be highly problematic given the impossibility of clearly delineating these two supposed classes. We return to this point below.

We assume that apparent cases of Root suppletion involve members of the functional vocabulary (e.g. *go/went*, is a light-verb;...), although other treatments are possible as well. (p. 6, emphasis added)

At issue for Embick and Halle (2005) is their insistence that there need be no such things as “stems” in the morphology which would have to be stored in the Vocabulary List along with Roots. So, for example, Embick and Halle reject the idea that English *broke* is listed in the Vocabulary as a stem form related to $\sqrt{\text{BREAK}}$. Rather, *broke* must be derived from *break* via a readjustment rule, as in (2):

$$(2) \quad V_{[-lo, +front]} \rightarrow [o] / \begin{array}{c} X \quad _ \quad Y[past], \\ X = \sqrt{BREAK}, \sqrt{SPEAK}, \dots \end{array} \quad (\text{cf. Embick \& Halle 2005})$$

Readjustment rules for Embick and Halle (2005) have “the limited expressive power of phonological rules” (p.17), and may not be employed “to relate the phonetic exponents of *radically different shapes*” (p.17, emphasis added). We have two objections to Embick and Halle’s discussion.

Our first objection is conceptual. We freely acknowledge that all linguists may have intuitions about the relative “closeness” of stems to their Roots, and that they may feel that some are in some sense “closer”, phonologically speaking, than others. However, we are left to wonder to what extent this mere intuition ought to be, and, indeed, to what extent this intuition *can* be, formalized in the grammar. Any effort to formalize this intuition will lead to a host of inter-related questions, which include: how “radical” is sufficiently radical to require full suppletion (differential Vocabulary insertion) rather than extensive (but still not quite “radical”) readjustment operations?; can there be some principled, pre-theoretical grammatical definition of “radical” in this context?; and, what is the actual implementation of such rules that distinguishes between radical and non-radical (but still potentially extensive) readjustments? To push the last question toward an adequate answer, we would like to address the further issue of how

readjustment ought to actually be implemented in DM in the first place. The answer to this question raises yet another one: is it really the case that radical readjustment ought to be outlawed in principle?

One possible approach to readjustment rules is offered by Raimy (2000) in his Precedence Based Phonology (PBP) theory of reduplicative morphology, which is couched in the framework of DM. Raimy explicitly includes linear precedence into his phonological representations (indicated by arrows linking segments, etc.), and he implements readjustment by maintaining that certain affixes can trigger the insertion of novel links into the representation. A standard PBP analysis of readjustment for deriving *broke* from $\sqrt{\text{BREAK}}$ in the past tense is shown in (3):

(3) Standard readjustment analysis using Raimy's PBP representations

- | | | | | |
|----|------------------------|---------|---|---------------------------------------|
| a. | # → b → r → ej → k → % | ‘break’ | < | $\sqrt{\text{BREAK}}$ |
| b. | | ‘broke’ | < | $\sqrt{\text{BREAK}} + [\text{PAST}]$ |

The crucial idea behind this PBP analysis is that certain morphemes, here a null exponent of T° in the context of the feature [PAST], can trigger the addition of new links into the phonological representation, including a link to phonological segments not already part of the Root's phonological representation (e.g. the link to the vowel /o/ instead of /ej/ in the string *b-r-ej-k* for $\sqrt{\text{BREAK}}$). Assuming that this is typical of readjustment rule implementation, it is not at all clear what principle would rule out a radical readjustment to derive ostensibly suppletive forms like *wen-t* from *go* (note that the symbols “#” and “%” are used to explicitly demarcate the beginning and end, respectively, of a phonological string):

(4) Radical readjustment using Raimy's PBP representations?

- a. $\# \rightarrow g \rightarrow o \rightarrow \%$ 'go' < $\sqrt{\text{GO}}$
- b. $\# \rightarrow g \rightarrow o \rightarrow \%$ 'wen-t' < $\sqrt{\text{GO} + [\text{PAST}]}$
 $\downarrow \quad \nearrow$
 $w \rightarrow \varepsilon \rightarrow n$

Although there may be some theory-internal way of blocking this kind of (apparently) radical readjustment (e.g. appeals to economy by limiting “skipped” links to two or fewer or some such), the readjustment shown in (4) is not different in principle from the standardly assumed readjustment shown in (3). No novel phonological operations have been introduced to cover some supposed sub-class of the vocabulary (e.g. “true suppletion” vs. pseudo-suppletion), as the output form for a radically different stem form can be derived by the same mechanisms already required for a minorly altered stem form (i.e. alteration of precedence relations prior to linearization).

In sum, it seems to us that, in principle, radical readjustment can certainly be done through brute force. It is not clear to us that this is a desirable outcome, however. The conclusion that we draw from this conceptual objection is that although the intuition regarding “close” vs. “radical” differences in form for different VIs may be strong, without being fleshed out in more detail this intuition has little force in compelling us to adopt one theoretical assumption over plausible alternatives.

This discussion might be beside the point, though, given our second objection, which is based on cross-linguistic empirical evidence. Put straightforwardly, to the contrary of Marantz (1997), Embick & Halle (2005), and others, we think that Root suppletion is simply an empirical reality, and one which can be observed in a variety of different contexts in different languages and language families. Such suppletion goes well beyond what we think could reasonably be

considered to be “functional vocabulary”, which is the conclusion that non-independently motivated, theory-internal assumptions may lead one to want to believe about such evidence.

To illustrate one set of examples, Langacker (1977:127) points out that number suppletion is ubiquitous in the Uto-Aztecan languages, although he maintains that these forms are “largely confined to verbs with basic meanings including ‘go’, ‘sit’, ‘run’, ‘kill’, ‘put’, etc.” (p.127). Following the assumptions of Embick and Halle (2005) and others, one might be tempted to regard such forms as functional vocabulary (e.g. “light verbs” or something along those lines). However, when we consider in more detail the actual examples of both noun and verb suppletion in these languages the fact that at least some of the relevant forms are lexical (i.e. Roots) seems inescapable.

The Northern Uto-Aztecan language Hopi, for example, has at least two kinds of suppletion that seems to involve Roots—one case involving nominals (showing suppletion for plurality vs. singular and dual) and one involving verbs (showing suppletion for plural number agreement). Consider first the class of suppletive nominals in Hopi. Regular number marking for animate nouns occurs according to the categories of singular, dual, and plural, as in (5):

(5) “Regular” number marking in Hopi nominals (Hill & Black 1998: 870)

<u>Gloss</u>	<u>Singular</u>	<u>Dual</u>	<u>Plural</u>
a. ‘person’	<i>sino</i>	<i>sinot</i>	<i>sinom</i>
b. ‘horse’	<i>kawayo</i>	<i>kawayot</i>	<i>kawayom</i>
c. ‘Navajo’	<i>Tasavu</i>	<i>Tasavut</i>	<i>Tasavum</i>

<i>Piece-based morphological analysis:</i>	√ROOT " -Ø	√ROOT-t " -DUAL	√ROOT-m " -PL

Abstracting away from some irregularities in Hopi number morphology which are irrelevant in the present context, a standard piece-based morphological analysis along the lines of that proposed in (5) would lead to the following as a first pass for Vocabulary entries for Hopi number morphology in the nominal domain:

(6) Vocabulary Entries for Hopi Nominal Number Morphology (default situation)

Ø	↔	[+SG]
- <i>t</i>	↔	[-SG, -PL]
- <i>m</i>	↔	[+PL]

Some noun Roots show suppletion for the plural, however, even though the singular and dual seem to be regular (i.e. showing a bare Root for the nominal, and *-t* suffixed to the Root in the dual):

(7) Suppletive number marking in Hopi nominals (Hill & Black 1998: 865)

<u>Gloss</u>	<u>Singular</u>	<u>Dual</u>	<u>Plural</u>
a. 'woman'	<i>wùuti</i>	<i>wùutit</i>	<i>momoyam</i>
b. 'boy, young man'	<i>tiyo</i>	<i>tiyot</i>	<i>tootim</i>
c. 'clan member'	<i>-wungwa</i>	-----	<i>ngyam</i>
d. 'house mouse'	<i>pöösa</i>	<i>pöösat</i>	<i>pövöyam</i> ³

In (7), the dual seems to be a clear case of regular suffixation of the appropriate suffix (*-t*) to the Root. The plural seems to take the expected plural suffix (*-m*, and in some cases, an additional regular way of marking plurals in Hopi—reduplication). However, note that the phonological forms of the plural stems are in no way obviously related to the phonological forms of the nominal/dual stems. Note also that the meanings of these *prima facie* suppletive stems seem to be quite specific (e.g. 'woman', 'young man', and 'clan member', cf. 7a-c, vs. 'person'—which happens to be regular, cf. 5a—as well as a specific species of rodent which is not likely to be a cultural or linguistic universal, 7d). We therefore regard these as strong candidates for authentic examples of Root suppletion. The alternative to recognizing that the plural Root is sufficiently distinct to call for suppletion in these cases (as is claimed by Hill & Black 1998) would be to call for radical Root readjustment (to derive the plural form from the singular/dual form in some way).

³ Cf. a regular reduplicating plural with a phonologically similar Root: *pöövölam* 'hunchbacks' (< *pöö-völa-m* RDP-hump-NSG; from Root *pööla* 'hump, hunched back').

Now consider the non-exhaustive list of suppletive Hopi verbs provided by Hill and Black (1998), which show variation according to number agreement (i.e. plural vs. singular and dual) for subjects (for intransitives, as in 8a) and objects (for transitives, as in 8b):⁴

(8) a. Hopi Verb Suppletion for Intransitive Subjects (Hill & Black 1998: 877, 866)

	<u>Gloss</u>	<u>sg./dl subj.</u>	<u>pl.subj.</u>
i.	‘arrive’	<i>pitu</i>	<i>ōki</i>
ii.	‘be dancing’	<i>wunima</i>	<i>tiiva</i>
iii.	‘be eating’	<i>tuumoyta</i>	<i>noonova</i>
iv.	‘descend’	<i>haawi</i>	<i>haani</i>
v.	‘die’	<i>mooki</i>	<i>so’a</i>
vi.	‘enter’	<i>paki</i>	<i>yungya</i>
vii.	‘fall’	<i>pòosi</i>	<i>löhö(k-)</i>
ix.	‘go out’	<i>yama(k-)</i>	<i>nönga(k-)</i>
x.	‘sit, dwell’	<i>qatu</i>	<i>yeese</i>
xi.	‘sleep’	<i>puuwi</i>	<i>tookya</i>
xii.	‘walk around’	<i>waynuma</i>	<i>yakta</i>

b. Hopi Verb Suppletion for Transitive Objects (Hill & Black 1998: 866)

	<u>Gloss</u>	<u>sg./dl. subj.</u>	<u>pl.subj.</u>
i.	‘bring along’	<i>wiiki</i>	<i>tsaama</i>
ii.	‘bring in, put into’	<i>pana</i>	<i>tangata</i>
iii.	‘kill’	<i>niina</i>	<i>qöya</i>
iv.	‘put, place’	<i>tavi</i>	<i>oya</i>
v.	‘put on top’	<i>tsokya</i>	<i>kwapta</i>

Many of these verbs also seem to be very “lexical” (i.e. Root-like) to us, in that they encode manner, direction, and other specific notions typically associated with lexical items (i.e. Roots) rather than functional elements (i.e. inflectional or derivational morphemes). From the point of view of Hopi language-specific morphology, the fact that these verbs are free morphemes also makes them appear to be more lexical than functional, with the latter type of morpheme (i.e. light verbs and derivational morphemes) being more typically affixal in this agglutinating language.

⁴ See Hale, Jeanne, and Pranka (1991) for additional examples of Hopi suppletive verbs, as well as a syntactic analysis of these verbs, couched within Government and Binding theory, which has much in common with what we argue for here. Although their analysis pre-dates the development of DM, Hale et al. presciently include in their GB analysis many features which would later become standard issue in DM, including merger and fusion of functional heads and, crucially, a version of Late Insertion for Roots.

As a case in point, a much more “functional”-looking group of suppletive elements in Hopi are the set of bound suffixes which also show suppletion for number:

(9) Hopi Suffixal Suppletion (Hill & Black 1998: 877)

	<u>Gloss</u>	<u>Abbrev.</u>	<u>sg./dl.</u>	<u>pl.</u>
a. repetitive	‘be X-ing (repeatedly)’	REP	- <i>ta</i>	- <i>tota</i>
b. causative	‘make X’	CAUS	- <i>ta</i>	- <i>tota</i>
c. distributive	‘do X multiply’	DISTR	- <i>ta</i>	- <i>tota</i>
d. durative	‘be X’	DUR	- <i>ta</i>	- <i>yungwa</i>
e. progressive	‘go along X-ing’	PROG	- <i>ma</i>	- <i>wisa</i>
f. pregressive	‘go to X’	PREG	- <i>to</i>	- <i>wisa</i>
g. continuative	‘keep X-ing’	CONT	- <i>lawu</i>	- <i>lalwa</i>
h. realized	‘become X(-ed)’	R	- <i>ti</i>	- <i>toti</i>

These suppletive VIs, which are bound morphemes with highly abstract meanings, would seem to us to be much more amenable to a “functional Vocabulary” analysis than the free verbs shown in (8) above.

Harley (2011a, 2011b) provides similar examples from the Southern Uto-Aztecan language Hiaki (Yaqui) to make the same point—i.e. that Roots can supplete for number in that language as well, cf. (10):

(10) a. Hiaki Verb Suppletion for Intransitive Subjects (Harley 2011b)

	<u>Gloss</u>	<u>sg. subj.</u>	<u>pl. subj.</u>
i.	‘arrive’	<i>yepsa</i>	<i>yaha</i>
ii.	‘be lying down’ (present tense)	<i>vo’ote</i>	<i>to’ote</i>
iii.	‘die’	<i>muuke</i>	<i>koko</i>
iv.	‘enter’	<i>kivake</i>	<i>kiimu</i>
v.	‘fall down’	<i>weche</i>	<i>watte</i>
vi.	‘get up’	<i>yehte</i>	<i>hoote</i>
vii.	‘go, leave (present tense)’	<i>siime</i>	<i>saka</i>
ix.	‘go, walk’	<i>weye</i>	<i>kaate</i>
ix.	‘run’	<i>vuite</i>	<i>tenne</i>
x.	‘sit down’ (present tense)	<i>yeesa</i>	<i>hooye</i>
xi.	‘stand up’	<i>kikte</i>	<i>hapte</i>
xii.	‘walk around’	<i>weama</i>	<i>rehte</i>

b. Hiaki Verb Suppletion for Transitive Objects (Harley 2011b)

	<u>Gloss</u>	<u>sg. obj.</u>	<u>pl.obj.</u>
i.	'bring in'	<i>kivacha</i>	<i>kiima</i>
ii.	'kill'	<i>me'a</i>	<i>sua</i>
iii.	'stand (s.t.) up'	<i>kecha</i>	<i>ha'abwa</i>
iv.	'put down, place'	<i>yecha</i>	<i>hoa</i>

The verb stems in both sets of Uto-Aztecan suppletion data (i.e. singular/dual vs. plural in Hopi, and singular vs. plural in Hiaki)⁵ are all susceptible to the standard phonological rules of these languages (e.g. vowel-shortening in certain affixational contexts). This would be quite odd in light of the radical readjustment approach (e.g. where one may want to derive the suppletive plural forms from the singular via radical readjustment as in 4 above). Under such a view, stem readjustment would have to apply, in order to yield the correct suppletive plural agreement form, and then *stem re-readjustment* would have to apply, in order to get yield vowel-shortening with the relevant T/A/M suffixes!

A further critical point about the “No Root Suppletion” thesis is its implication for the diachronic development of functional morphemes. Light verbs and other functional morphemes are typically (and perhaps always?) derived diachronically from full lexical verbs (cf., e.g., Bybee et al. 1994 and a mountain of other work on grammaticalization with much evidence on this point). The “No Root Suppletion” hypothesis entails that suppletion cannot occur until this grammaticalization process is complete. Thus, this theoretical orientation requires some kind of discrete discontinuity between “lexical morphemes” (Roots) and “functional morphemes”, according to which the former must transform into the latter, “overnight” as it were, before being susceptible to suppletion. As far as we are aware, no theory-neutral criteria for unambiguously

⁵ Intriguingly, although the meanings of suppletive verbs in Hopi and Hiaki seem to be very similar in many cases, most of the actual suppletive Vocabulary Items in these two languages seem not to be cognate. This fact leads to an intriguing question about the diachronic development of suppletive forms in these and other Uto-Aztecan languages. Getting to the bottom of this puzzle would be a worthwhile pursuit that clearly goes well beyond the scope of the present paper.

and uncontroversially distinguishing “functional morphemes” from “lexical morphemes” exists. Nor, for that matter, do criteria exist for even deciding what constitutes “suppletion” in the first place (see Veselinova 2006 for pertinent discussion of this point). The position that we advocate here, i.e. that Root suppletion exists and can be accounted for by positing distinct entries in the Vocabulary, does not run afoul of the potentially gradual diachronic development of the functional morphemes available in any given language, nor does it require that we treat a subclass of the Vocabulary (i.e. Roots) as needing a special status with respect to the syntax (i.e. Early Insertion, or visibility). We suggest that the real issue for suppletive pairs in natural languages is not necessarily one of “functional” morphemes vs. “lexical” ones, but rather one of high word frequency for suppletive pairs.⁶ Having some phonological similarity between semantically related stems certainly aids in the language learner’s task, and non-phonologically related suppletive stems would have to be used frequently enough for their semantic relationship to be learnable. The fact remains, though, that suppletion among lexical Roots appears to be relatively rare and marked in the world’s languages. However, in general not much seems to be known about the diachronic development of suppletion in natural languages, and we have little to add on this interesting and important issue here.

To sum up our discussion of our first empirical objection to Early Root Insertion: we see two distinct possibilities for the analysis of apparent Root suppletion in Hopi, Hiaki, and other languages. First, we could maintain the assumption that Roots cannot supplete and allow instead

⁶ Although we think that burden of proof for the “No Root Suppletion” thesis should be placed on those who would choose to adopt that particular position, which Embick and Halle (2004) correctly note is, at this point, a mere assumption about how languages “ought” to work given DM theory-internal considerations, we can offer positive evidence in favor of the view that the transition from lexical morphemes to functional morphemes is gradual, even in the case of suppletive morphemes. For example, there is a class of Vocabulary Items that Tubino, Harley, and Haugen (2009) regard as “hybrid” between full lexical verbs, i.e. serving as free morphemes, and functional morphemes, i.e. bound affixes with bleached semantics. These hybrids have similar syntactic properties as free verbs although their morphological distribution as bound elements is indicative of the relevant Roots being in transition between free lexical verbs and bound light verbs. Some of these are suppletive in both their lexical and their functional guises (e.g. *hapte* ‘stand.PL’ and *–hapte* ‘start or stop, PL’).

for radical stem readjustment. Given the discussion above that the “No Root Suppletion” assumption needs to be justified as well as the problems with radical stem readjustment that we have outlined, we find this option to be unsatisfactory. The second analysis would be to recognize Root suppletion as such, and then to allow the grammar to countenance this phenomenon in some way.

If we make the move towards recognizing Root suppletion, though, then there may be no point in having readjustment rules in the first place. We find the possibility of obviating readjustment rules to be a positive outcome. Indeed, this is the first of our conceptual considerations in favor of allowing Late Root Insertion, a point to which we now turn.

2.2. Conceptual considerations I — Obviating readjustment rules

We regard readjustment rules to be extremely problematic in the first place. Readjustment rules, which originate in Chomsky & Halle (1968) and are also related to Aronoff (1976)-style word-formation rules, are post-syntactic phonological rules that replace some aspect of the phonology of a Root which has already been inserted into a syntactic derivation with new phonology, provided that the proper morphosyntactic triggering environment is present. For example, the vowel in the English noun *mouse* is replaced with [aj] in the environment of [past] to yield *mice*. As has been discussed in innumerable places throughout the literature on morphological theory (for example, see Lieber 1992, Prince & Smolensky 2004, among many others), word-based replacement rules, while excellent at empirical coverage, are, in general, inherently extremely (and, perhaps, overly) powerful given their unrestricted nature.⁷

⁷ For the morpheme-based, item-and-arrangement model of DM, in particular, word-replacement rules seem to be out of place from the outset, as such rules only exist to accommodate ostensibly non-concatenative morphology. But incorporating readjustment rules into the theory introduces the concomitant lack of restrictiveness which is inherent to rule-based theories of morphology, something which DM purports to improve upon. Harley and Noyer (1999: 22)

We are not the only practitioners of DM who also find this theoretical device to be suspect. Embick & Halle (2005: 29) themselves, for example, even after defending the use of readjustment rules, note that although the grammar requires both Vocabulary insertion and readjustment rules, the former should be invoked in preference to the latter whenever it is possible to do so. Embick and Halle codify this aesthetic intuition as the *piece assumption*:

- (11) **Piece Assumption:** All other things being equal, a piece-based analysis is preferred to a Readjustment Rule analysis when the morpho-syntactic decomposition justifies a piece-based treatment. (Embick & Halle 2005: 29)

We take this comment to be indicative of hesitance on Embick and Halle's part when it comes to the use of readjustment rules—readjustment rules seem to be a necessary evil which should be appealed to only as a last resort.⁸

Readjustment rules have been standard fare for DM since its foundation, but we think that the theory would be much better off without them. The current literature contains some promising theoretical approaches to the syntax-morphology interface which are in a similar vein to standard DM, but which either have overtly done away with readjustment rules or which contain mechanisms which may be employed to do so. Although this in itself is a large issue for

draw attention to this flaw of readjustment by stating that "no interesting theory of readjustment could be proposed since any theory that permitted *bad* to be respelled as *worse* could presumably do anything". They go on claim that the stipulation that readjustment doesn't apply to true suppletion and only applies to "pseudo-suppletive pairs like *destroy ~ destruct*-" creates precisely the necessary restriction. However, even with such a stipulation that readjustment rules don't apply to truly suppletive pairs, the very form of readjustment rules is what makes them unrestricted (as discussed below). If they are powerful enough to cover all the pseudo-suppletive alternations, then they may well be powerful enough to cover all of the suppletive ones as well, and, if this were the case, they could still be powerful enough to "do anything". What we all lack at this point in time is an explicit theory of readjustment rules which clarifies what counts as "real" vs. "pseudo" suppletion. The perspective argued for in this paper, which would abandon the distinction between "pseudo-" and "real" suppletion as well as the use of readjustment rules, obviates this problem.

⁸ The "piece assumption" has further applications in domains of morphology beyond those being discussed here—for example, in accounting for prosodic morphology, which, *prima facie*, should be amenable to non-piece-based theoretical treatments. Haugen (2011), though, critiques the two extant readjustment-based theories of reduplication in DM, finds them lacking in important regards, and offers a piece-based analysis of the "reduplicant" as a morpheme in its own right. Although the "piece assumption" is not adopted as such in Haugen 2011, if it is to be taken seriously such an assumption could certainly be used as an additional supporting argument in favor of a piece-based treatment of reduplicative (and other prosodic) morphology in DM, over readjustment-based alternatives.

which more discussion is certainly warranted than what we can offer here, we do at least want to demonstrate that there are some plausible ways to operationalize a version of DM without readjustment rules.

One example is provided by Siddiqi (2009), who offers a model of DM which explicitly abandons readjustment rules. In this model, Root suppletion is accounted for by the proposition that fusion is a default operation. Roots fuse with functional material in their extended projection (see Grimshaw 2000 for *extended projection*). Vocabulary Items (VIs) such as English *sing*, *sang*, *sung*, and *song* all compete with each other for insertion into a node containing $\sqrt{\text{SING}}$ which itself can be fused with a variety of features and functional heads. So, for Siddiqi (2009), the English VI for *sang* is specified for realizing $\sqrt{\text{SING}}$, [V], and [past] while the VI *song* is specified for $\sqrt{\text{SING}}$ and [n]; *sang* can only be inserted into a node where the root has merged and fused with a c-commanding verbalizer and past tense while *song* can only be inserted into a node where the root has merged and fused with a c-commanding nominalizer. One major drawback to this theory, though, is that it forces massive amounts of fusion which for regular morphology and functional items otherwise needs to be constrained. Svenonius (2012) introduces a solution to this problem with the notion of *spanning*, wherein Vocabulary insertion can target sequences of heads (“spans”) without actually requiring that they fuse to form a single complex head.

While not necessarily rejecting readjustment rules outright, another recent proposal also obviates the need for readjustment rules. Radkevitch (2010) proposes that insertion can target non-terminal nodes. This removes fusion (and the conspiracy that it typically creates) and readjustment from the grammar. Stem allomorphy, including suppletive allomorphy, can be done in this model by having VIs realize a node that dominates both a Root and functional material. For example, in a derivation containing both [plural] and a Root, *mice* can be inserted into Num',

which dominates both Num⁰ and the Root (as well as the intermediate NP).

Additionally, practitioners of nanosyntax (Starke 2009, Caha 2009; et al.) make use of a variety of novel mechanisms, including phrasal insertion (i.e. the insertion of entire phrases into non-terminal nodes rather than just single Vocabulary Items, or “morphemes”, into terminal nodes), cyclic override (i.e. insertion of an item into a non-terminal node subsequent to the completed insertion of a different item into a previous (non-)terminal node, where the newer later “overrides” the earlier),⁹ and the superset principle (i.e. the notion that the features of VIs are a superset of the feature content of the environment they are inserted into, rather than being a subset as in standard DM thinking). Nanosyntax thus offers another model of the grammar that can use Late Insertion to account for Root suppletion without using readjustment rules, in addition to potentially addressing other issues for DM like the proliferation of zero morphemes.

However, none of these models, as currently envisaged, are free from possible objections. Siddiqi’s model lacks an effective way of controlling fusion; Radkevitch’s model and nanosyntax both require all material below a particular non-terminal node to be realized with just one VI, so portmanteaux could never dominate anything,¹⁰ and nanosyntax’s superset principle has yet to be explicitly worked out in detail. Also, all three models necessarily treat all forms of base modification that are not phonologically regular (i.e. “weak suppletion”), such as the ablaut in *sing/sang/sung/song*, as being just as suppletive as true (“strong”) suppletive pairs such as *bad/worse* and *go/went*, relegating any explanation of their synchronic phonological similarities

⁹ For example, in a derivation for *mice*, insertion begins at the Root, where *mouse* is inserted. Insertion progresses cyclically up the extended projection from the Root. Upon reaching [plural] in NumP, Insertion recognizes that *mice* is available to be inserted into the entire NumP and it overrides the insertion of *-s* and the previous insertion of *mouse*, effectively erasing the previous form.

¹⁰ For example, for the Spanish *del* (and corresponding French *du*), which is a portmanteau of *de* (head of a KP or PP similar to English *of*) and *el* (head of a DP), both models would have insertion at a node that dominates both *de* and *el*, presumably K' (or P'). Since *del* is in the extended projection of a noun, it necessarily dominates both the NP and the Root, yet *del* does not typically fuse with the Root it dominates. If insertion is happening at the non-terminal node, there is no formalized way (to our knowledge) to stop insertion at a lower non-terminal node, so it ought to be the case that all the material in an extended projection fuses, not just material relatively high in the projection.

to artifacts of diachrony.¹¹

Although we do not specifically endorse any of the above potential analyses here, we do hope to at least have demonstrated that workable versions of DM without readjustment rules are conceivable, and, indeed, that they already exist from a variety of related perspectives. We thus suggest that these models (and/or the pursuit of other models without readjustment rules) would be preferable to a DM model in which powerful and stipulative readjustment rules linger alongside theoretical mechanisms, including suppletion of at least some set of VIs, that every version of the theory already countenances.

In sum, the current status quo is that scholars such as Embick & Halle admit the need for some suppletion while also employing rampant readjustment operations. While the extant alternative approaches (or even some as yet-to-be-specified new approach(es)) without readjustment rules could potentially lead to rampant suppletion, including the storage of stems as well as Roots in the List of Vocabulary Items, a point in favor of such models is that *every* theory requires the memorization of a large number of Vocabulary Items (i.e. Roots, affixes, etc.). It is not obvious that the cognitive upper bound on such memorization would necessarily be exceeded by the theoretical position that we advocate here. The use of readjustment rules, however, does make certain predictions about cognitive processing, taxation on memory, etc., that ought to be specifically tested in order to be verified, if they are to be included in theory.

Having suggested that Root suppletion exists and that readjustment operations may be superfluous, we now turn to a second empirical argument in favor of Late Root Insertion.

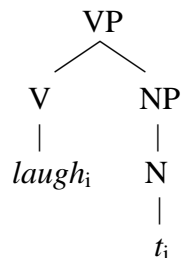
¹¹ Although many morphologists would see this as a weakness of these models, we actually take this to be a strength, because the supposed division between weak (“pseudo”) suppletion and strong suppletion has not been well defined and no clear criteria have been put forth which would lead to an obvious characterization of any given morphological alternation as being in one supposed category rather than the other.

2.3. Empirical considerations II — Hyponymous direct objects in noun incorporation constructions

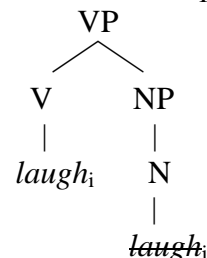
Two major advances in the syntactic treatment of cross-linguistic word-formation processes over the past quarter century have been Baker's (1988) account of noun incorporation (NI) as syntactic head-movement (which explains the cross-linguistic absence of agentive subject incorporation by appealing to independently-motivated constraints on head movement), and Hale and Keyser's (1993, 2002) extension of Baker's theory of head-movement incorporation to unergative denominal verb formation in English and other languages. Hale and Keyser hold that such verbs, ostensibly being syntactically intransitive while being semantically transitive, actually derive from incorporation of an underlying object nominal into the verbal position. This can be accomplished under various theories of movement, including movement (with traces, as in Baker 1988) or copying (cf. Chomsky 1995):

(12) Hale and Keyser's Derivation of English Unergative Denominal Verbs

a. Movement with trace



b. Movement as “copy”



An argument in favor of this syntactic analysis of unergative denominal verbs is that pragmatic redundancy occurs when such verbs take an overt cognate object. For example, it has often been noted that without a clear discourse context such sentences are less anomalous when the cognate objects receive some kind of additional modification than when such cognate objects

appear in object position with no modification;¹² cp. (13b,c) and (14a,b):

- (13) Pragmatic Redundancy with Cognate Objects
- a. Hortense is laughing/dancing.
 - b. ?Hortense is laughing a laugh/dancing a dance.
 - c. ?Hortense is laughing the laugh/dancing the dance.
- (14) Less Redundancy with Modifiers for Cognate Objects
- a. He laughed a false laugh that held genuine bitterness. (Michael Chabon, *Gentlemen of the Road*, p. 187).
 - b. Hortense is dancing a happy dance.

We emphasize that this redundancy is truly one pertaining to Root identity between the verb and its object, rather than some kind of conceivable constraint against verb-object homophony or some such other “Obligatory Contour Principle” applied to the syntax. There is no pragmatic redundancy when a homophonous (i.e. non-Root identical) noun is the object of verb:

- (15) No pragmatic redundancy with homophonous objects (Haugen 2009b):
- a. I saw *Saw*. (i.e. the movie)
 - b. I saw *Saw II* too. (i.e. the sequel)
 - c. I saw *Saw III* three times. (i.e. the sequel’s sequel)
 - d. I heard a herd (of wildebeests).

Further, there is no similar pragmatic proscription against “cognate subjects”, whether modified or not. Rather, cognate nominals are perfectly acceptable as subjects in the relatively few cases where they share Root identity with their verbal counterparts:

- (16) No proscription against “Cognate Subjects” (Haugen 2009b)
- a. The cook is cooking (dinner/the dinner).
 - b. The snitch snitched.

These considerations lead us to conclude that there is a real syntactically-based constraint on what can form an unergative denominal verb. As per the analysis provided by Hale & Keyser, these unergative denominal verbs are derived from the incorporation of the Root which was base-generated in the object position.

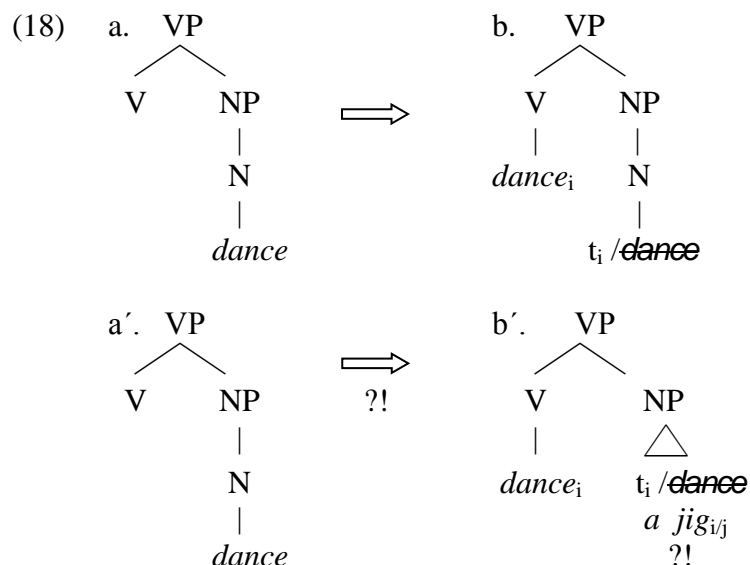
¹² See Macfarland (1995) for relevant discussion and the results of a corpus study of written English showing that sentences with unmodified cognate objects are extremely rare compared to sentences containing modified cognate objects.

There is potentially a major problem for this approach, though—one which is equally problematic for Baker’s head-movement account of NI as head-movement—namely, the existence of *hyponymous* direct object arguments. In many cases, a non-Root-identical nominal can appear in the object position of an unergative denominal verb (or a noun-incorporating verb):

(17) Noun Incorporation with overt Hyponymous Object Arguments

- a. English
Larry danced a jig.
- b. Hiaki — $\sqrt{\text{chuu}}'u$ ‘dog’ + $\sqrt{\text{kava}}'i$ ‘horse’ (Haugen 2009a)
- i. *Aapo chuu'u-ta kava-'ek*
 3.SG dog-ACC horse-POSS
 ‘S/he has a dog as a horse’ (~ ‘S/he horse-has a dog’)
- ii. *Aapo kava'i-ta chuu'u-'k*
 3.SG horse-ACC dog-POSS
 ‘S/he has a horse as a dog’ (~ ‘S/he dog-has a horse’)

The problem is graphically illustrated in (18). If an unergative denominal verb is derived by movement (or copying) from the object position, how does a non-Root-identical nominal find its way into the trace (or lower copy) position?



The hyponymous object problem applies equally to Baker-style NI constructions where the direct object is clearly in a configurational syntactic position and, even so, it contains a hyponymous

object nominal Root in that position. Consider the Hopi example in (19), where an incorporated nominal (*kùŷ-*, from $\sqrt{\text{kuuyi}}$ ‘contained liquid’) appears on the verb (*tàngta* ‘put.into.container(s)’), and the object position contains a hyponymous nominal (*yòypala* ‘rainwater’), which is in turn marked for accusative case:

(19) Hopi Noun Incorporation with Hyponymous Direct Object (Hill 2003: 237)

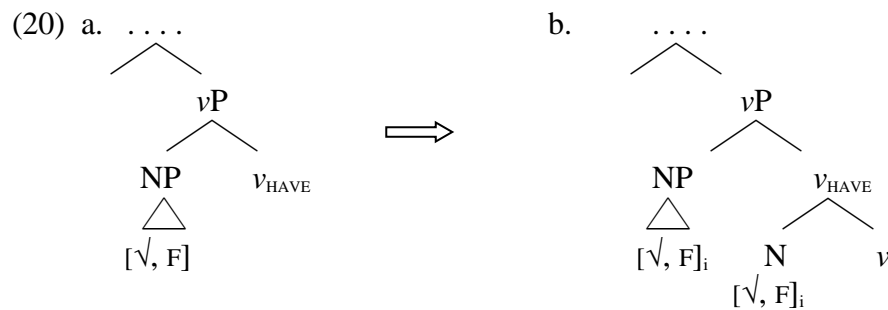
<i>Nu'</i>	<i>yòypala-t</i>	<i>kùŷ-tàngta.</i>	($< \sqrt{\text{kuuyi}}$ ‘contained liquid’)
I	<u>rainwater</u> -ACC	<u>contained.liquid</u> -put.into.container(s)	
‘I put the rainwater into some containers.’			

Although canonical cases of “classifier NI” in many of Baker’s analyses of Mohawk involve what he regarded as non-configurationality (i.e. co-indexed “adjunct” NPs, and not argument NPs in their base-positions), NI and denominal verb examples in Hopi are configurational and clearly involve direct object arguments, as evidenced by: (i) word-order (the object NP/DP is in the canonical pre-verbal object position in this SOV language), and (ii) object case-marking, i.e. the overt accusative case suffix (*-t*).

There is an extensive literature debating the issue of whether or not denominal verb and NI constructions can be conflated into a single syntactic process. See Haugen (2008, 2009a) for a recent overview of the crucial issues. The central contention involves the nature of the verbal element in such constructions: with denominal verbs the element is typically a bound affix (cf. Sadock 1980), but with NI the verbal element is a free verb (cf. Mithun 1984). This debate is reminiscent of the lexical vs. functional morpheme discussion that we provided above, and our conclusion here is the same: our version of DM, which limits the morpho-phonological exponents of *all* morphemes to post-syntactic Late Insertion, does not need to decide between two discrete “types” of morphemes. This is a beneficial position to take since both constructions at hand have the same hyponymy construal, as would be expected if they are derived from the same syntactic operations, as Hale and Keyser have suggested. What is the source of this

hyponymy construal, though?

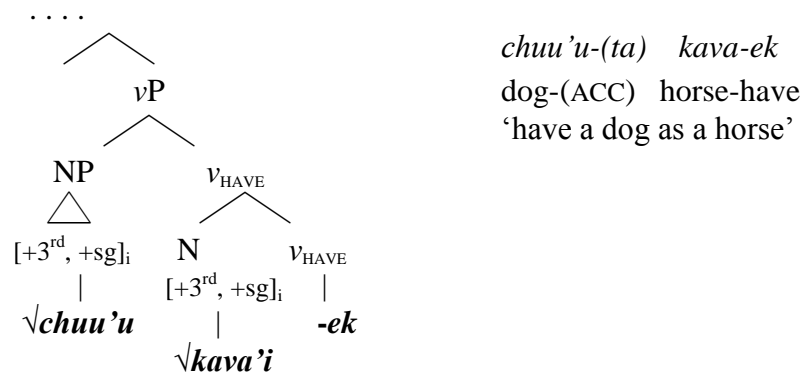
In the analysis of Haugen (2008, 2009a), for examples like (16-b-i) and (16-b-ii), which differ along the lines of “horse-having a dog” and “dog-having a horse”, there are two possible spell-outs of the same syntactic configuration given a numeration with the Hiaki Roots \sqrt{kava} ‘horse’ and \sqrt{chuu} ‘dog’. Either one or the other is the head of the chain, and the other is the tail. The narrow syntax of this construction is the same in both cases, and is something like the following derivational representation, where a Root node ($\sqrt{}$) and related features (if any, F) move into (or are copied) into verbal position (i.e. they undergo *incorporation*):



The actual insertion of particular Root Vis, which contain the actual phonological realization of those Roots, will occur Post-syntactically, at Morphological Structure, where the speaker has two options of where to place the Roots—i.e. at the head or tail of the chain:

(21) Spell-out = Root-Insertion (Post-syntax, at Morphological Structure) (Haugen 2009a)
 { \sqrt{chuu} ’u ‘dog’ ... \sqrt{kava} ’i ‘horse’ }

a. SPELL-OUT I



kava'i-(ta) *chuu'u-k*
horse-(ACC) dog-have
'have a horse as a dog'

The point of our present discussion is this—the hyponymy construal in these constructions is the result of the derivation (i.e. feature copy, or movement), with the second copy getting a coerced reading as a more specific instance of the incorporated copy (as per Grice’s Maxim of Quantity, etc.). It is fundamentally *not* a result of a speaker’s encyclopedic knowledge of the specific Roots at hand (i.e. ‘dogs’ are not types of ‘horses’, or vice versa, in either Hiaki culture or our own). In fact, the hyponymy construal can be coerced for *any* object in the lower position, which will be interpreted as a more specific example of whatever Root one might insert into the higher position.

Our conclusion from these facts is the following. A head-movement incorporation analysis of both construction types (NI and unergative denominal verbs) can be maintained if Roots are inserted after head movement (or copying) has already taken place (cf. Haugen 2008, 2009a). This move entails that the theory must allow for the Late Insertion of Roots. This is desirable in order to maintain an elegant account of a wide range of cross-linguistic phenomena pertaining to incorporation and related construction types (including unergative denominal verbs). Abandoning the possibility for the Late Insertion of Roots in favor of Early Root Insertion would also ultimately entail abandoning the incorporation analyses proposed by Baker and Hale and Keyser, which we think is highly undesirable.

2.4. Conceptual considerations II — Non-universality

Our final conceptual argument against Early Root Insertion is the following. DM has always aimed to be a universalistic theory of syntactic computation when it comes to closed-class items such as syntactic structures and semantic features. On this point, when introducing the theory Halle & Marantz (1993) state:

...it is assumed here that at LF, DS, and SS terminal nodes consist exclusively of morphosyntactic/semantic features and lack phonological features. The morphosyntactic features at these levels are drawn from a set made available by Universal Grammar (we are unaware of any arguments that language-specific features are necessary at these syntactic levels). The semantic features and properties of terminal nodes created at DS will also be drawn from Universal Grammar and perhaps from language-particular semantic categories or concepts. (p. 121)

The morphophonological content of Roots is open class and obviously language-specific. Thus, Late Root Insertion preserves the original conception of DM, where the features manipulated by the narrow syntax are drawn from a closed universal set.

While we understand that this may not be a completely damning argument against Early Root Insertion, it must be the case that Early Root Insertion requires abandoning the universalist position for DM that was initially outlined by Halle and Marantz. Proponents of this position should take such an abandonment seriously and offer compelling arguments that the universalist position is wrong-headed. (We leave aside the important question of what the universal syntactico-semantic feature set might actually look like, aside from reiterating our previous observation that it cannot contain language-specific elements like particular Roots with their phonological exponents, i.e. language-specific VIs).

This issue raises a further, more general question, though. The syntactic component is responsible for the vast majority of the morphology and semantics of a given derivation in many contemporary Minimalist frameworks such as DM and nanosyntax. But, what objective

measures can we identify which might categorize a particular feature (such as [pass] in Embick 2000, see discussion below) as *syntactic* (i.e. in the universal feature set and belonging to the narrow syntax) or *post-syntactic* (or “morphological”, i.e. potentially language-specific)? The traditional view seems to have been that any feature that affects the syntax is necessarily syntactic. The strongest extension of that idea is that *all* grammatical (i.e. not phonological) features must be syntactic. If that is indeed the case, then there could never be evidence for Early Root Insertion because *all* features that could condition allomorphy would be present throughout the derivation. If that is not the case, on the other hand, and if some features truly are post-syntactic, then we are left in the somewhat dissatisfying theoretical position that it may be impossible to theory-neutrally categorize which features are syntactic and which are post-syntactic.¹³ Therefore, the stronger hypothesis that **all** formal features are syntactic seems to exclude falsifiability or verifiability of the Early Root Insertion hypothesis. On the other hand, accepting Early Root Insertion forces us into a position wherein **some** grammatical features are non-syntactic, in turn requiring us to develop clear criteria to distinguish between syntactic and non-syntactic features. As far as we are aware, at present this requirement has not yet been met. We suggest that Late Root Insertion should be preferred until there are such criteria.

In sum, Early Root Insertion forces us into abandoning **both** the strong theoretical position that **all** features that are relevant to the syntax are present in the narrow syntax and the equally strong position that **only** those features that are universal and syntactically relevant are present in the narrow syntax. While some theorists may argue that abandoning these strong positions is warranted, it does not seem to us to be the case that the weaker position is well articulated in the Early Root Insertion literature and it is certainly not the position originally put

¹³ We thank an anonymous reviewer for bringing this to our attention.

forth by Halle and Marantz. It is our claim here that the adoption of this weaker position may not be warranted by the proposed gains from adopting Early Root Insertion.

Having examined some empirical and conceptual reasons to reject Early Root Insertion, we turn now to a discussion of the original arguments in favor of Early Root Insertion, which are derived from Embick's (2000) analysis of Latin deponent verbs.

3. Revisiting Embick's (2000) arguments for Early Root Insertion

The strongest argument that we are aware of which explicitly requires Early Root Insertion in order to have specific Roots be present throughout the syntactic derivation is Embick's (2000) analysis of deponent verbs in Latin. The crux of Embick's argument is that certain Roots of Latin, the deponent verbs, contain arbitrary features which induce syntactic consequences—namely, passive-like analytic morphology in the perfect. Because of these syntactic consequences, Embick reasons, the deponent verb Roots themselves must be in the syntax at the outset of the derivation.

In Embick's analysis the relevant feature which triggers analytic morphology is the one associated with passive morphology, [pass]. Although normally associated with the actual passive (relating to passive voice), deponent verb Roots, under Embick's analysis, contain the [pass] feature inherently. When they are inserted into the derivation, which occurs early in the syntax before the morphology, they will trigger passive-like morphology due to the presence of this feature. This passive-like morphology includes analytic morphology in the perfect, which under Embick's analysis results because Asp^0 cannot move to T^0 when both [perf] and [pass] are present.

The morphological results of this can be seen by comparing the active and passive pairs of a regular Latin verb with the corresponding forms for a deponent. In the present, regular

actives and passives yield synthetic forms such as *am-ō* ‘I love’ and *am-or* ‘I am loved’ (cf. the deponent *hort-or* ‘I exhort’, which takes passive morphology even though it has active syntax); in the perfect, regular verbs take on a more analytic structure, as in *am-ā-tus sum* ‘I am loved’, which involves the verb stem (e.g. *am-ā-tus*) plus an auxiliary (*sum*) (cf. the perfect of the deponent, *hort-a-tus sum* ‘I have exhorted’, which likewise has passive morphology but active syntax).

The structure that Embick provides for Latin passives and deponent verbs is the following. For true passives, the [pass] feature originates in *v* and in this originating point it blocks the Merging of external arguments; for deponents, on the other hand, the [pass] feature is intrinsic to the Root, and this origination point is irrelevant to Merge at *v* vis-a-vis external arguments. In both cases the [pass] feature will block the movement of Asp to T, leading to analytic morphology where T is realized separately as an auxiliary (though T ultimately Merges with an Agr head post-syntactically at Morphological Structure). Thus, passive perfectives and deponents both involve a participial with the structure of a complex head of the form $\sqrt{\text{v-Asp}}$ (cf. *am-ā-tus* and *hort-a-tus*) plus an auxiliary with the structure T-Agr (cf. *sum*).

One objection to Embick’s analysis is that it need not mandate that the phonology of Roots be present throughout the derivation. Even if we accept Embick’s idea that specific Roots (i.e. the class of deponent verbs) must be individuated and identified in the syntax, nothing in such an analysis entails that the ϕ -features of those Roots need also be present in the syntax. Alternative views maintain that Root content is connected to abstract conceptual features only (e.g. Pfau 2009, Siddiqi 2009), and Roots of this more abstract nature could also introduce the [pass] feature into the syntax. Harley (2011a) provides an alternative model of DM wherein Roots are not tied to specific concepts, but rather contain indices to specific Vocabulary Items

(linkings of form and meaning). Even these indexed Roots, which lack conceptual content, could be attached to lexically-specific syntactic features (e.g. Embick's [pass]), and would therefore be compatible with a Late Insertion account of Latin deponent verbs.

A second objection to Embick's Early Root Insertion analysis comes from Embick himself. Embick (2000) provides three plausible accounts for deponent verbs in Latin, of which the one that he actually adopts, Early Root Insertion, is the third. Embick's first analysis would maintain that [pass] is a purely morphological feature. Embick rejects this idea on the basis that analytic perfects allow non-adjacency in the surface word order. A morphological analysis of these perfects problematically requires movement after the syntax. We agree that such a post-syntactic movement analysis is unsatisfactory and understand why Embick abandons it as a possibility.

In Embick's second analysis, though, he argues that there could be two locations where [pass] could be generated by the syntax: under v (associated with the lack of an external argument, for true passives) and under $\sqrt{}$ (irrelevant to the presence or absence of external arguments, for the deponent verbs). Embick gives a plausible syntactic analysis whereby this second [pass] licenses (a la Harley & Noyer 2000) the insertion of deponent VIs with passive morphology and external arguments, but prohibits regular verbs from surfacing with external arguments and passive morphology.

Crucially, this analysis is a *licensing* analysis of the insertion of Root VIs. With this analysis Root VIs are still inserted late, so this account would be compatible with the Late Insertion analyses of Root suppletion and hyponymous objects in NI contexts that we discussed above.

When we consider data from elsewhere in Latin morphology we find strong evidence

suggesting that Embick's second analysis is the correct one after all. Since it is a licensing account, there need be no claim that the Root itself is tied to the feature [pass]. Rather, specific VIs, the class of deponent verbs, are licensed for insertion into an environment of [pass], whether under deponent-specific $\sqrt{}$ nodes or under *v*.¹⁴ This, combined with the types of root suppletion that are discussed above, predicts that there could be verbs which act “normally” in some environment but have “suppletive” forms that are licensed as deponents in other environments. This prediction turns out to be true in the case of the class of Latin semi-deponent verbs, which have normal active syntax in all tenses and aspects except for the perfect, where they take on deponent-like analytic passive morphology while retaining active-like active syntax. This small closed class of verbs includes the following Roots:¹⁵

(22) Latin Semi-Deponent Verbs (Greenough et al. 1903: 106)

a.	audeō,	audēre,	ausus	‘dare’
b.	fīdō,	fidēre,	fīsus	‘trust’
c.	gaudeō,	gaudēre,	gāvīsus	‘rejoice’
d.	soleō,	solēre,	solitus	‘be wont’

Semi-deponent verbs are, in essence, deponents in one syntactic context only (i.e. the perfect). In short, semi-deponents are regular verbs which become deponents as a result of contextual allomorphy.

Semi-deponent verbs can be treated precisely the way irregular or suppletive forms of other verbs are treated in models of DM that allow for Root suppletion via Late Insertion: the deponent forms (e.g. *solitus*) are irregular forms that block the regular productive forms and are licensed for an environment containing both [perf] and [pass]. Analytic morphology follows as in the case of regular passives and true deponents.

¹⁴ More recent work in the decomposition of functional projections may actually necessitate putting the passive voice feature associated with blocking external arguments in a *voice* head, higher than *v*. See, for example, Pylkkänen (2008), Harley (2007), Alexiadou, Anagnostopoulou & Schäfer (2006), etc.

¹⁵ We thank Matt Tucker for pointing out to us the relevance of the Latin semi-deponent verbs for this discussion.

Embick (2000) ultimately rejected this (his second) analysis of the Latin deponent verbs for a number of reasons, the chief of which was that it seems to needlessly complicate Latin syntax by adding a second generation position for the [pass] feature (i.e. $\sqrt{\text{ }}$). To the contrary, we propose that a slight complication of Latin syntax is to be preferred to the radical overhaul of the theory of DM which Early Root Insertion entails, which in cascading fashion further leads to such unhappy results as missing out on the benefits of Late Root Insertion argued for here. Furthermore, this cost of a more complicated syntax for Latin, in addition to paying for the maintenance of Late Root Insertion, also allows for the prediction of, and thus an account for, Latin's semi-deponent verbs. As a result, we find the argument from deponent verbs for the early insertion of Root phonology to be dissatisfying. We instead prefer Embick (2000)'s second account, which keeps the [pass] feature entirely syntactic, rather than lexical (i.e. tied to the Root VI).

Even in the absence of such a second syntactic account, though, we believe that nothing about tying the feature [pass] to specific deponent roots should mandate that the phonology of those Roots must also be inserted early. Embick's third (and final) account is perfectly compatible with a Pfau (2009)- or Harley (2011a)-style analysis containing individuated, but still abstract, Roots.

In sum, we conclude that an adequate account of Latin deponent verbs can be offered without appealing to Early Root Insertion. The abandonment of Embick's third analysis of Latin deponent verbs thus removes a major cornerstone of the Early Root Insertion approach, and in so doing re-opens the door to Late Root Insertion.

4. Concluding Discussion

Our purpose in these remarks has been to suggest that DM practitioners should maintain that Late Insertion applies to Roots as well as functional morphemes, as originally intended by Halle & Marantz when they introduced the theory. Our arguments have come from empirical facts from different syntactic constructions cross-linguistically (e.g. Root suppletion and hyponymous objects in noun incorporation and related constructions) as well as conceptual considerations (e.g. the beneficial obviation of readjustment rules and the language-specificity of Roots in the otherwise potentially universal domain of narrow syntax). A crucial issue that we will leave open to future research is the following important question – what actually *is* in the syntactic derivation in lieu of Roots with all of their semantic and phonological features? We see at least three possible answers to this question.

Firstly, the narrow syntax could contain Roots with their full semantic (conceptual) content, but not actual Vocabulary Items with phonological content. This kind of theory is proposed in Pfau (2009), and has been largely adopted in such work as Siddiqi (2009) and others. In this kind of theory Roots compete for insertion, and since the conceptual content of Roots is available to the syntax the narrow syntax cannot be universal, containing, as it must, conceptual content like $\sqrt{\text{OCELOT}}$ and other language- and culture-specific notions.

Secondly, it is conceivable that the narrow syntax does only contain and manipulate universal conceptual information, as was supposed by Halle and Marantz (1993). Under such a theory the narrow syntax could contain only universal conceptual information, including such abstract syntactic-semantic features as [3^{rd} person], [\pm animate], [\pm human], etc. If this view is on the right track then the syntax could plausibly contain something like $\sqrt{\text{ANIMAL}}$ (as an amalgamation of feature values drawn from the universal feature set), but certainly not more specific entries like $\sqrt{\text{OCELOT}}$ and the like.

Thirdly, it is also conceivable that Roots in the narrow syntax are devoid of all content, both conceptual and phonological. Harley (2011a) proposes a theory along these lines, where Roots are necessarily individuated via an index, but they do not associate with semantic or ϕ -features until Vocabulary insertion occurs at Morphological Structure. In this way the narrow syntax manipulates vacuous variable entries like $\sqrt{_{142}}$, which only get language- and culture-specific conceptual content when a particular form-meaning pairing (e.g. VI_{142} : /OCELOT/) is inserted from the Vocabulary List post-syntactically at Morphological Structure. Such a view seems to be completely compatible with the Late Root Insertion view that we have advocated here.

A final open question is whether either of the latter two approaches obligatorily necessitate competition among Roots for insertion, as is presupposed in the first approach. Given the hyponymous object examples from NI contexts, where different Roots can be freely inserted at either end of a movement chain (and wherein this differential insertion can be used creatively by speakers to coerce hyponymous readings), we suspect that the best approach will turn out to be one wherein Roots do not (necessarily) compete for insertion. At this point, though, we will have to leave the solution to this crucial problem open for future research.

References

- Alexiadou, Artemis, Elena Anagnostopoulou, & Florian Schafer. 2006. The properties of anticausatives crosslinguistically. In Mara Frascarelli (ed.), *Phases of Interpretation*, Berlin: Mouton de Gruyter, pp. 187–211.
- Aronoff, Mark. 1976. *Word Formation in Generative Grammar*. Cambridge, MA: MIT Press.
- Baker, Mark C. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.
- Bybee, Joan, Revere Perkins and William Pagliuca. 1994. *The Evolution of Grammar: Tense, Aspect, and Modality in the Languages of the World*. Chicago: University of Chicago Press.
- Caha, Pavel. 2009. The nanosyntax of case. PhD Dissertation. University of Tromsø.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, Noam, and Morris Halle. 1968. *The Sound Pattern of English*. New York: Harper and Row.
- Embick, David. 2000. Features, syntax, and categories in the Latin perfect. *Linguistic Inquiry* 31.2: 185-230.
- Embick, David, and Morris Halle. 2005. On the status of *stems* in morphological theory. In Twan Geerts et al., eds., *Romance Languages and Linguistic Theory 2003*, 59-88. Amsterdam: John Benjamins.
- Embick, David, and Rolf Noyer. 2007. Distributed Morphology and the Syntax/Morphology Interface. In *The Oxford Handbook of Linguistic Interfaces*, ed. Gillian Ramchand and Charles Reiss, 289-324. Oxford: Oxford University Press.
- Greenough, J.B., A.A. Howard, G.L. Kittredge, and Benj. L. D'Ooge. 1903. *Allen and Greenough's New Latin Grammar for Schools and Colleges, founded on comparative grammar*. Boston: Ginn & Company.
- Grimshaw, Jane. 2000. Locality and Extended Projection. In *Lexical Specification and Insertion*, ed. by Peter Coopmans, Martin Everaert, and Jane Grimshaw. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Hale, Kenneth L., LaVerne Masayeva Jeanne, and Paula M. Pranka. 1991. On suppletion, selection, and agreement. In *Essays in Honor of S.Y. Kuroda*, ed. by Carol Georgopoulos and Roberta Isihara, 255-70. Dordrecht: Kluwer.
- Hale, Kenneth L., and Samuel Jay Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, ed. Kenneth Hale and Samuel Jay Keyser, 53-109. Cambridge, MA: MIT Press.
- Hale, Kenneth L., and Samuel Jay Keyser. 2002. *Prolegomenon to a Theory of Argument Structure*. Cambridge, MA: MIT Press.
- Halle, Morris, and Alec Marantz. 1993. Distributed Morphology and the pieces of inflection. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, ed. Kenneth Hale and Samuel Jay Keyser, 111-176. Cambridge, MA: MIT Press.
- Halle, Morris, and Alec Marantz. 1994. Some key features of Distributed Morphology. In *Papers on Phonology and Morphology*, ed. Andrew Carnie and Heidi Harley, 275-288. Cambridge, MA: MIT Working Papers in Linguistics 21.
- Harley, Heidi. 2007. External arguments: On the independence of voice and v. Talk given at GLOW, Tromsø, Norway. April 14, 2007.

- Harley, Heidi. 2011a. On the identity of roots. Ms, University of Arizona.
<http://ling.auf.net/lingBuzz/001527>)
- Harley, Heidi. 2011b. Hiaki Morphosyntax. Ms, Handout for Morphosyntax of Hiaki Course, LSA Summer Institute—University of Colorado, Boulder.
- Harley, Heidi and Rolf Noyer. 1999. State-of-the-article: Distributed Morphology. *Glot International* 4: 3-9.
- Harley, Heidi and Rolf Noyer. 2000. Licensing in the non-lexicalist lexicon. In *The Lexicon/Encyclopedia Interface*, Bert Peeters (ed), 349-374. Amsterdam: Elsevier Press.
- Haugen, Jason D. 2008. *Morphology at the Interfaces: Reduplication and Noun Incorporation in Uto-Aztecan*. Amsterdam: John Benjamins Publishing Company (Linguistik Aktuell/Linguistics Today 117).
- Haugen, Jason D. 2009a. Hyponymous objects and Late Insertion. *Lingua* 119: 242-262.
- Haugen, Jason D. 2009b. A note on roots and redundancy. Ms, Oberlin College.
<http://ling.auf.net/lingBuzz/001367>)
- Haugen, Jason D. 2011. Reduplication in Distributed Morphology. *Proceedings of the 4th Arizona Linguistics Circle Conference (ALC 4)*. *Coyote Papers vol. 18*. Tucson, AZ: Department of Linguistics, University of Arizona.
<http://arizona.openrepository.com/arizona/handle/10150/138590>)
- Hill, Kenneth C. 2003. Hopi denominal and noun-incorporating verbs. In *Studies in Uto-Aztecan*, Luis M. Barragan and Jason D. Haugen (eds), 215-244. Cambridge, MA: MIT Working Papers on Endangered and Less Familiar Languages #5.
- Hill, Kenneth C., and Mary E. Black. 1998. A sketch of Hopi grammar. In *Hopi Dictionary: Hopïikwa Lavàytutuveni: A Hopi-English Dictionary of the Third Mesa Dialect*, ed. by the Hopi Dictionary Project, 861-900. Tucson, AZ: University of Arizona Press.
- Langacker, Ronald W. 1977. *Studies in Uto-Aztecan Grammar I: An Overview of Uto-Aztecan Grammar*. Dallas, TX: Summer Institute of Linguistics.
- Lieber, Rochelle. 1992. *Deconstructing Morphology: Word Formation in Syntactic Theory*. Chicago: University of Chicago Press
- Macfarland, Talke. 1995. Cognate Objects and the Argument/Adjunct Distinction in English. Ph.D. dissertation, Northwestern University.
- Marantz, Alec. 1995. A late note on Late Insertion. In Young-Sun Kim et al., eds., *Explorations in Generative Grammar*, 396-413. Seoul: Hankuk.
- Marantz, Alec. 1997. Stem suppletion, or the arbitrariness of the sign. Talk given at the Université' de Paris VIII.
- Mithun, Marianne. 1984. The evolution of noun incorporation. *Language* 60: 847-95.
- Pfau, Roland. 2009. *Grammar as Processor: A Distributed Morphology Account of Spontaneous Speech Errors*. Amsterdam: John Benjamins Publishing Company (Linguistik Aktuell/Linguistics Today 137).
- Prince, Alan and Paul Smolensky. 2004. *Optimality Theory: Constraint interaction in generative grammar*. Oxford: Blackwell Press.
- Pylkkänen, Liina. 2008. *Introducing Arguments*. Cambridge, MA: MIT Press.
- Radkevitch, Nina. 2010. Overlapping portmanteaus: Why they do not exist. Talk given at the 41st North Eastern Linguistic Society Conference, The University of Pennsylvania.
- Raimy, Eric. 2000. *The Phonology and Morphology of Reduplication*. Berlin: Mouton de Gruyter (Studies in Generative Grammar 52).

- Sadock, Jerrold M. 1980. Noun incorporation in Greenlandic: A case of syntactic word-formation. *Language* 57: 300-319.
- Siddiqi, Daniel. 2009. *Syntax within the Word: Economy, allomorphy, and argument selection in Distributed Morphology*. Amsterdam: John Benjamins Publishing Company (Linguistik Aktuell/Linguistics Today 138).
- Starke, Michael. 2009. Nanosyntax: A short primer on a new approach to language. Nordlyd: Tromsø University Working Papers on Language and Linguistics 36, ed. P.Svenonius, G. Ramchand, M. Starke and T. Taraldsen, 1-6. Tromsø: University of Tromsø.
- Svenonius, Peter. 2012. Spanning. Ms. CASTL, University of Tromsø.
(<http://ling.auf.net/lingBuzz/001501>)
- Tubino, Mercedes, Heidi Harley, and Jason D. Haugen. 2009. The syntax of verb/affix lexemes and clause fusion in Hiaki (Yaqui). *Rice Working Papers in Linguistics 1*: 79-91.
(http://www.ruf.rice.edu/~rls/vol.1/Tubino-Blancoetal_RWP.pdf)
- Veselinova, Ljuba N. 2006. *Suppletion in Verb Paradigms: Bits and Pieces of the Puzzle*. Amsterdam: John Benjamins Publishing Company (Typological Studies in Language 67).

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