

# Remarks and Replies

## Roots and the Derivation

*Jason D. Haugen*

*Daniel Siddiqi*

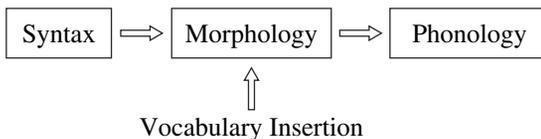
Contrary to recent work in Distributed Morphology adopting Early Root Insertion (the notion that Roots are present from the outset of the syntactic derivation), we argue that Late Insertion applies to Roots just like other morphemes. We support this conclusion with empirical evidence (Root suppletion 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 semideponent verbs) allow us to recast Embick's (2000) licensing analysis of Latin deponent verbs as a further argument for Late Root Insertion.

*Keywords:* Roots, Late Insertion, Root suppletion, readjustment rules, hyponymous objects, Distributed Morphology

## 1 Introduction

The earliest work in Distributed Morphology (DM) crucially assumed *Late Insertion* for all Vocabulary items, or VIs (see Halle and Marantz 1993, 1994, Harley and Noyer 1999, and much other work). This entails that morphemes, construed as abstract syntacticosemantic 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 in (1).

(1) *The architecture of the grammar in DM*



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While the initial proposals for DM by Halle and Marantz (1993, 1994) simply assumed this 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: (a) 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); (b) that the idiosyncratic meaning differences between specific Roots (e.g.,  $\sqrt{\text{CAT}}$  vs.  $\sqrt{\text{CELOT}}$ ) are also irrelevant to the syntax (with Marantz claiming that the semantic difference between Roots is indexical, in parallel to the interpretation of deictics);<sup>1</sup> and (c) that the architecture of DM does not allow idiosyncratic syntactic or semantic compositionality with VIs (or idioms, or . . .). This last point entails that "words" are restricted to the same operations that 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*: 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 and Halle 2005 and Embick and Noyer 2007. It is our purpose in this article 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 after all, at least as far as the morphophonological forms of Roots (i.e., the spelled-out morphemic exponents referred to as VIs) are concerned. 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 (section 2.1) and hyponymous direct objects in noun incorporation constructions (section 2.3), as well as conceptual considerations including the desirability of obviating readjustment rules (section 2.2) and the nonuniversality of Root morphemes (section 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 revisit in section 3 one of the primary sources serving as an impetus for the Early Root Insertion view, Embick's (2000) analysis of deponent verbs in Latin. Taking into account additional facts from

<sup>1</sup> Similarly, Harley and Noyer (1998) provide a licensing account of argument selection in DM where the syntax is blind to the semantic difference between specific Roots.

Latin morphosyntax (specifically, those involving the class of semideponent verbs), we advocate an alternative analysis that 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 Distributed Morphology

### 2.1 Empirical Considerations I: Root Suppletion

One major argument for Early Root Insertion is the supposed universal ban on *Root suppletion*.<sup>2</sup> This typological argument derives from such works as Marantz 1997 and Harley and Noyer 1998, 1999, where it is argued 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: for example, in English, for a [past] feature on T<sup>0</sup> certain Roots can take specific “irregular” suffixes (-t, -Ø, etc., in lieu of default -ed); [plural] in Num<sup>0</sup> can be spelled out with special suffixes depending on Root classes (-i, -en, -Ø, etc., with -s being the default, or “elsewhere,” suffix); and so on.

That this kind of contextual allomorphy should be unavailable for Roots is a crucial component of Embick and Halle’s (2005) presentation of the DM framework. As they put it, “We 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*” (pp. 5–6; emphasis in original). They go on to state, “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 that 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).

<sup>2</sup> 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” (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*), other cases have little in common phonologically (e.g., *go* ~ *went*, *bad* ~ *worse*). Some commentators regard only the latter class as “true suppletion” and relegate the former to “pseudosuppletion” 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.

- (2)  $V_{[-low, +front]} \rightarrow [o] / X \text{ — } Y[past]$ ,  
 $X = \sqrt{BREAK}, \sqrt{SPEAK}, \dots$   
 (see Embick and Halle 2005)

For Embick and Halle, readjustment rules 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).

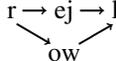
We have two objections to Embick and Halle’s discussion. Our first objection is conceptual. We freely acknowledge that all linguists may have intuitions about the relative “closeness” of stems to their Roots, and that they may feel that some are in some sense “closer,” phonologically speaking, than others. 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 interrelated questions, including these:

- 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, pretheoretical grammatical definition of “radical” in this context?
- What is the actual implementation of such rules that distinguishes between radical and nonradical (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 in 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  $\sqrt{BREAK}$  in the past tense is shown in (3).

- (3) *Standard readjustment analysis using Raimy’s (2000) PBP representations*
- a. # → b → r → ej → k → % ‘break’ <  $\sqrt{BREAK}$
- b. # → b → r → ej → k → % ‘broke’ <  $\sqrt{BREAK} + [PAST]$
- 

The crucial idea behind this PBP analysis is that certain morphemes—here, a null exponent of  $T^0$  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 /ow/ instead of /ej/ in the string *b-r-ej-k* for  $\sqrt{BREAK}$ ). 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 (2000) PBP representations?*

- a. # → g → o → % ‘go’ < √GO  
 b. # → g → o → % ‘wen-t’ < √GO + [PAST]  
     w → ε → 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), 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 subclass of the Vocabulary (e.g., “true suppletion” vs. pseudosuppletion), 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” versus “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 crosslinguistic empirical evidence. Put straightforwardly, unlike Marantz (1997), Embick and Halle (2005), and others, we think that Root suppletion is simply an empirical reality, and one that 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.” Following the assumptions of Embick and Halle (2005) and others, one might be tempted to regard such forms as functional Vocabulary (“light verbs” or something along those lines). However, when we consider actual examples of both noun and verb suppletion in these languages in more detail, 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 and Black 1998:870)

Gloss	Singular	Dual	Plural
a. ‘person’	sino	sinot	sinom
b. ‘horse’	kawayo	kawayot	kawayom
c. ‘Navajo’	Tasavu	Tasavut	Tasavum
Piece-based morphological analysis	√ROOT " -∅	√ROOT-t " -DUAL	√ROOT-m " -PL

Abstracting away from some irregularities in Hopi number morphology that 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)

∅	↔	[+ SG]
-t	↔	[- SG, - PL]
-m	↔	[+ 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 and Black 1998:865)

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

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: for example, ‘woman’, ‘young man’, and ‘clan member’ (see (7a–c)) vs. ‘person’—which happens to be regular (see (5a))—as well as a particular species of rodent that is not likely to be a cultural or linguistic universal (see (7d)). We therefore regard these as strong candidates for authentic examples of Root suppletion. The alternative to recognizing that the

<sup>3</sup> Compare a regular reduplicating plural with a phonologically similar Root: *pöövölam* ‘hunchbacks’ (< *pöö-völa-m* RDP-hump-NOM.SG, from Root *pööla* ‘hump, hunched back’).

plural Root is sufficiently distinct to call for suppletion in these cases (as Hill and Black (1998) claim) would be to call for radical Root readjustment (to derive the plural form from the singular/dual form in some way).

Now consider the following nonexhaustive list of suppletive Hopi verbs, which show variation according to number agreement (i.e., plural vs. singular and dual) for subjects (for intransitives, as in (8)) and objects (for transitives, as in (9)):<sup>4</sup>

(8) *Hopi verb suppletion for intransitive subjects* (Hill and Black 1998:866, 877)

Gloss	Sg./Dl. Subj.	Pl. Subj.
a. 'arrive'	pitu	öki
b. 'be dancing'	wunima	tiiva
c. 'be eating'	tuumoyta	noonova
d. 'descend'	haawi	haani
e. 'die'	mooki	so'a
f. 'enter'	paki	yungya
g. 'fall'	pòosi	löhö(k-)
h. 'go out'	yama(k-)	nönga(k-)
i. 'run'	wari(k-)	yùtu(k-)
j. 'sit, dwell'	qatu	yeese
k. 'sleep'	puuwi	tookya
l. 'walk around'	waynuma	yakta

(9) *Hopi verb suppletion for transitive objects* (Hill and Black 1998:866)

Gloss	Sg./Dl. Subj.	Pl. Subj.
a. 'bring along'	wiiki	tsaama
b. 'bring in, put into'	pana	tangata
c. 'kill'	niina	qöya
d. 'put, place'	tavi	oya
e. 'put on top'	tsokya	kwapta

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)

<sup>4</sup> 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-Binding Theory, which has much in common with what we argue for here. Although their analysis predates the development of DM, Hale, Jeanne, and Pranka presciently include in their Government-Binding analysis many features that would later become standard issue in DM, including merger and fusion of functional heads and, crucially, a version of Late Root Insertion.

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

(10) *Hopi suffixal suppletion* (Hill and Black 1998:877)

	Gloss	Sg./DI.	Pl.
a. Repetitive	‘be X-ing (rep.)’	-ta	-tota
b. Causative	‘make X’	-ta	-tota
c. Distributive	‘do X multiply’	-ta	-tota
d. Durative	‘be X’	-ta	-yungwa
e. Progressive	‘go along X-ing’	-ma	-wisa
f. Pregressive	‘go to X’	-to	-wisa
g. Continuative	‘keep X-ing’	-lawu	-lalwa
h. Realized	‘become X(-ed)’	-ti	-toti

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) and (9).

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

(11) *Hiaki verb suppletion for intransitive subjects* (Harley 2011a)

Gloss	Sg. Subj.	Pl. Subj.
a. ‘arrive’	yepsa	yaha
b. ‘be lying down’ (present tense)	vo’ote	to’ote
c. ‘die’	muuke	koko
d. ‘enter’	kivake	kiimu
e. ‘fall down’	weche	watte
f. ‘get up’	yehte	hoote
g. ‘go, leave’ (present tense)	siime	saka
h. ‘go, walk’	weye	kaate
i. ‘run’	vuite	tenne
j. ‘sit down’ (present tense)	yeesa	hooye
k. ‘stand up’	kikte	hapte
l. ‘walk around’	weama	rehte

(12) *Hiaki verb suppletion for transitive objects* (Harley 2011a)

Gloss	Sg. Obj.	Pl. Obj.
a. 'bring in'	kivacha	kiima
b. 'kill'	me'a	sua
c. 'stand (something) up'	kecha	ha'abwa
d. 'put down, place'	yecha	hoa

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)<sup>5</sup> 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)). 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 yield vowel shortening with the relevant tense/aspect/mood 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 (see, e.g., Bybee, Perkins, and Pagliuca 1994 and considerable 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 and uncontroversially distinguishing “functional morphemes” from “lexical morphemes” exist. Nor, for that matter, do criteria exist for deciding what constitutes “suppletion” in the first place (see Veselinova 2006 for pertinent discussion of this point). The position that we advocate here—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 versus “lexical” ones; rather, it is one of high word frequency for suppletive pairs.<sup>6</sup> Having some phonological similarity between

<sup>5</sup> Intriguingly, although the meanings of suppletive verbs in Hopi and Hiaki seem to be very similar in many cases, most of the actual suppletive VIs 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 article.

<sup>6</sup> Although we think that the burden of proof for the “No Root Suppletion” thesis should be placed on those who adopt that position (which Embick and Halle (2005) 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

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 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 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 toward recognizing Root suppletion, though, 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. Readjustment rules, which originated with Chomsky and Halle (1968) and are also related to Aronoff (1976)-style word formation rules, are postsyntactic phonological rules that replace some aspect of the phonology of a Root that 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 [plural] to yield *mice*. As has been discussed in innumerable places throughout the literature on morphological theory (see Lieber 1992, Prince and 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.<sup>7</sup>

We are not the only practitioners of DM who find this theoretical device to be suspect. Embick and Halle (2005:60) themselves, for example, even after defending the use of readjust-

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example, in Hiaki there is a class of VIs that Tubino, Harley, and Haugen (2009) regard as "hybrid" between full lexical verbs (i.e., verbs serving as free morphemes) and functional morphemes (i.e., bound affixes with bleached semantics). These hybrids have syntactic properties similar to those of 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').

<sup>7</sup> 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 nonconcatenative morphology. But incorporating readjustment rules into the theory introduces the concomitant lack of restrictiveness that is inherent to rule-based theories of morphology, something that DM purports to improve upon. Harley and Noyer (1998:133) 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

ment 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*.

(13) *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 and Halle 2005:60)

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 that should be appealed to only as a last resort.<sup>8</sup>

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 that are in a similar vein to standard DM, but either have overtly done away with readjustment rules or contain mechanisms that may be employed to do so. Although this in itself is a large issue for which more discussion is certainly warranted than 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 that 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*). 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 *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 otherwise needs to be constrained to account for

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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 pseudosuppletive 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 that clarifies what counts as "real" versus "pseudo" suppletion. The perspective argued for here, which would abandon the distinction between "pseudo" and "real" suppletion as well as the use of readjustment rules, obviates this problem.

<sup>8</sup> 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.

regular morphology and functional items. 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 nonterminal 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 Num<sup>0</sup> and the Root (as well as the intermediate NP).

Additionally, practitioners of nanosyntax (e.g., Caha 2009, Starke 2009) make use of a variety of novel mechanisms, including phrasal insertion (i.e., the insertion of entire phrases into nonterminal nodes rather than just single VIs, or “morphemes,” into terminal nodes), cyclic override (i.e., insertion of an item into a nonterminal node after a different item has already been inserted into a previous (non)terminal node, where the newer “overrides” the earlier),<sup>9</sup> 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, as currently envisaged, none of these models are free from possible objections. Siddiqi's (2009) model lacks an effective way of controlling fusion; Radkevitch's (2010) model and nanosyntax both require all material below a particular nonterminal node to be realized with just one VI, so portmanteaux could never dominate anything;<sup>10</sup> and nanosyntax's Superset Principle has yet to be worked out in explicit 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 to artifacts of diachrony.<sup>11</sup>

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

<sup>9</sup> 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, Vocabulary 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.

<sup>10</sup> 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 posit 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 nonterminal node, there is no formalized way (to our knowledge) to stop insertion at a lower nonterminal 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.

<sup>11</sup> Although many morphologists would see this as a weakness of these models, we actually take it 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 that would show that any given morphological alternation is in one supposed category rather than the other.

conceivable, and, indeed, that they already exist. 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 subset of VIs, that every version of the theory already countenances.

In sum, the current status quo is that scholars such as Embick and 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 VIs, a point in favor of such models is that *every* theory requires the memorization of a large number of VIs (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. However, the use of readjustment rules does make certain predictions about cognitive processing, taxation on memory, and so on, that ought to be specifically tested in order to be verified, if such rules are to be included in the theory.

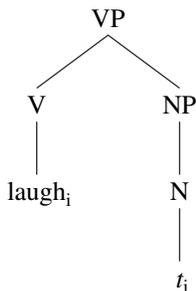
Having suggested that Root suppletion exists and that readjustment operations may be superfluous, we now turn to a second empirical argument in favor of Late Root Insertion.

### 2.3 Empirical Considerations II: Hyponymous Direct Objects in Noun Incorporation Constructions

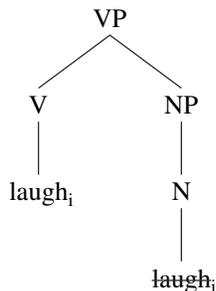
Two major advances in the syntactic treatment of crosslinguistic word formation processes over the past quarter century have been Baker's (1988) account of noun incorporation (NI) as syntactic head movement (which explains the crosslinguistic absence of agentive subject incorporation by appealing to 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 actual movement (with traces, as in Baker 1988) or copying (as in Chomsky 1995).

(14) *Hale and Keyser's (1993, 2002) 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;<sup>12</sup> compare (15b–c) and (16a–b).

- (15) *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*.
- (16) *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 a verb.

- (17) *No pragmatic redundancy with homophonous objects* (Haugen 2009b:2)
- 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.

- (18) *No proscription against ‘‘cognate subjects’’* (Haugen 2009b:1)
- 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 Hale and Keyser’s analysis, these unergative denominal verbs are derived from the incorporation of the Root that was base-generated in the object position.

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

There is potentially a major problem for this approach, though—one that is equally problematic for Baker's (1988) 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).

(19) *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:250)

i. Aapo **chuu'u**-ta *kava*-'ek.

3SG **dog**-ACC *horse*-POSS

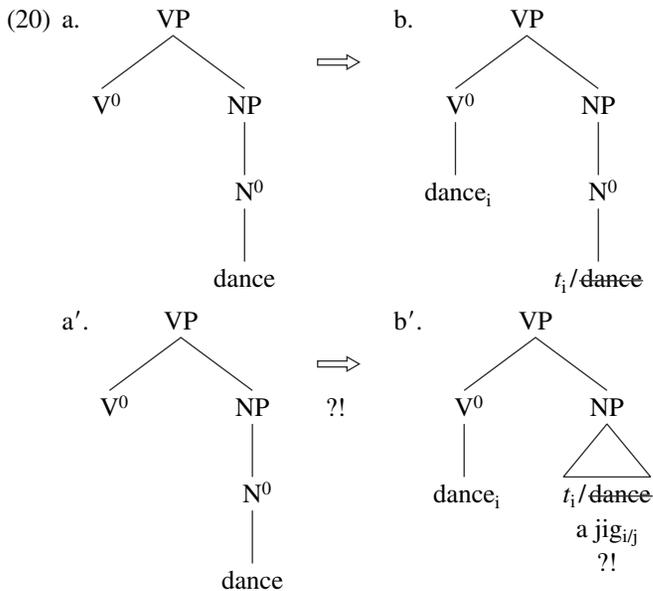
'She/He has a **dog** as a *horse*.' (~ 'She/He horse-has a dog')

ii. Aapo *kava*'i-ta **chuu'u**-'k.

3SG *horse*-ACC **dog**-POSS

'She/He has a *horse* as a **dog**.' (~ 'She/He dog-has a horse')

The problem is graphically illustrated in (20). 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?



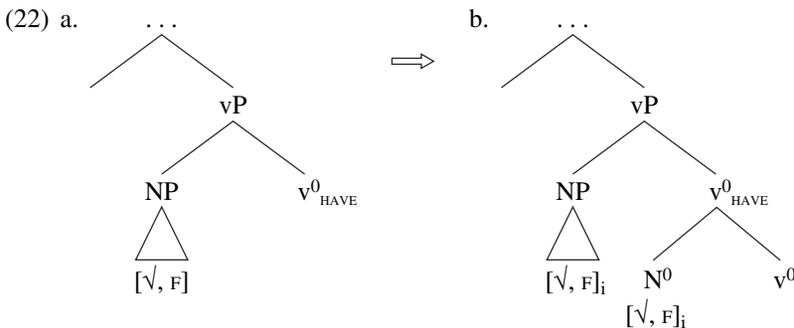
The hyponymous object problem applies equally to Baker-style NI constructions where the direct object is clearly in a configurational syntactic position and, even so, it contains a hyponymous object nominal Root in that position. Consider the Hopi example in (21), where an incorporated nominal (*küy-*, 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.

- (21) *Hopi noun incorporation with hyponymous direct object* (Hill 2003:237)  
 Nu' yòypala-t kùy-tàngta. (< √KUYI 'contained liquid')  
 I rainwater-ACC contained.liquid-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 regards as nonconfigurality (i.e., coindexed "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 (a) word order (the object NP/DP is in the canonical preverbal object position in this SOV language), and (b) object case-marking (i.e., the overt accusative case suffix (-t)).

There is an extensive literature debating whether or not denominal verb and NI constructions can be conflated into a single syntactic process (see Haugen 2008, 2009a for recent overviews of the crucial issues). The central contention involves the nature of the verbal element in such constructions: with denominal verbs the verbal element is typically a bound affix (see Sadock 1980), but with NI it is a free verb (see Mithun 1984). This debate is reminiscent of the lexical-versus-functional-morpheme discussion that we provided above, and our conclusion here is the same: our version of DM, which limits the morphophonological exponents of *all* morphemes to postsyntactic 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 proposed by Haugen (2008, 2009a), for examples like (19bi–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 √KAVA'I 'horse' and √CHUU'U 'dog'. Either one Root 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 derivational representation in (22), where a Root node (√) and related features (if any, F) move into (or are copied into) verbal position (i.e., they undergo *incorporation*).



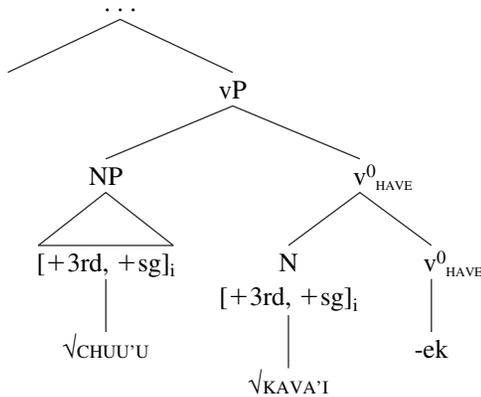
The actual insertion of particular Root VIs, which contain the actual phonological realization of those Roots, will occur postsyntactically, at Morphological Structure, where the speaker has two options of where to place the Roots: at the head or tail of the chain, as shown in (23).

(23) *Spell-out = Root Insertion (postsyntax, at Morphological Structure)* (Haugen 2009a)

{ ... √CHUU'U 'dog' ... √KAVA'I 'horse' ... }

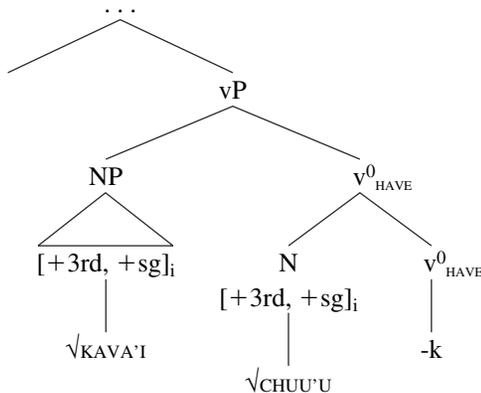
## a. Spell-out I

chuu'u-(ta) kava-ek  
 dog-(ACC) horse-have  
 'have a dog as a horse'



## b. Spell-out II

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 encyclopaedia knowledge of the specific Roots at hand (i.e., dogs are not types of horses, or vice versa, in either Hiaki culture or American/'Western' culture). 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 this. 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 (see 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 crosslinguistic phenomena pertaining to incorporation and related construction types (including unergative denominal verbs). Abandoning the possibility of Late Root Insertion in favor of Early Root Insertion would also ultimately entail abandoning the incorporation analyses proposed by Baker and by Hale and Keyser, which we think is highly undesirable.

#### 2.4 *Conceptual Considerations II: Nonuniversality*

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 and Marantz (1993:121) state:

[I]t 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.

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 damaging 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 abandonment seriously and offer compelling arguments that the universalist position is wrong. (We leave aside the important question of what the universal syntacticosemantic feature set might actually look like, aside from repeating our previous observation that it cannot contain language-specific elements like particular Roots with their phonological exponents—that is, 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 that 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 *postsyntactic* (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. On the other hand, if that is not the case, and if some features truly are postsyntactic, 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 postsyntactic.<sup>13</sup> 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 nonsyntactic, in turn requiring us to develop clear criteria to distinguish between syntactic and nonsyntactic 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 forth by Halle and Marantz. It is our claim here that adopting 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 we are aware of that explicitly requires Early Root Insertion so that specific Roots will 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 that 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 that triggers analytic morphology is the one associated with passive morphology, [pass]. Although normally associated with the actual passive (relating to passive voice), under Embick's analysis deponent verb Roots contain the [pass] feature inherently. When they are inserted into the derivation, which occurs early in the syntax before the morphology, they trigger passive-like morphology owing to the presence of this feature. This

<sup>13</sup> We thank an anonymous reviewer for bringing this to our attention.

passive-like morphology includes analytic morphology in the perfect, which under Embick's analysis results because  $\text{Asp}^0$  cannot move to  $T^0$  when both [perf] and [pass] are present.

The morphological results of this analysis 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 (*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 merger 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-à-vis external arguments. In both cases, the [pass] feature blocks the movement of  $\text{Asp}^0$  to  $T^0$ , leading to analytic morphology where  $T^0$  is realized separately as an auxiliary (though  $T^0$  ultimately merges with an Agr head postsyntactically at Morphological Structure). Thus, passive perfectives and deponents both involve a participial with the structure of a complex head of the form  $\sqrt{\text{v}^0\text{-Asp}^0}$  (cf. *am-ā-tus* and *hort-a-tus*) plus an auxiliary with the structure  $T^0\text{-Agr}^0$  (*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 phonological 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 (2011b) provides an alternative model of DM wherein Roots are not even tied to specific concepts, but rather contain indices to specific VIs (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 nonadjacency in the surface word order. A morphological analysis of these perfects problematically requires movement after the syntax. We agree that such a postsyntactic 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  $\text{v}^0$  (associated with the lack of an external argument, for true passives) and under  $\sqrt{\text{v}}$  (irrelevant to the presence or absence of external arguments, for the deponent verbs). Embick gives a plausible syntactic analysis whereby this second [pass] licenses (in the manner of Harley and Noyer 1998) 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  $\sqrt{\quad}$  nodes or under  $v^0$ .<sup>14</sup> This, combined with the types of Root suppletion that are discussed above, predicts that there could be verbs that 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 Latin semideponent 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:<sup>15</sup>

(24) *Latin semideponent verbs* (Greenough et al. 1903:106)

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

Semideponent verbs are, in essence, deponents in one syntactic context only (i.e., the perfect). In short, semideponents are regular verbs that become deponents as a result of contextual allomorphy.

Semideponent 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.

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.,  $\sqrt{\quad}$ ). On the contrary, we propose that a slight complication of Latin syntax is to be preferred to the radical overhaul of the theory of DM that 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

<sup>14</sup> More recent work on the decomposition of functional projections may actually necessitate putting the passive voice feature associated with blocking external arguments in a Voice<sup>0</sup> head, higher than  $v^0$ . See, for example, Alexiadou, Anagnostopoulou, and Schäfer 2006, Harley 2007, Pykkänen 2008.

<sup>15</sup> We thank Matt Tucker for pointing out to us the relevance of the Latin semideponent verbs for this discussion.

Root Insertion, also allows for the prediction of, and thus an account for, Latin's semideponent 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's (2000) 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 (2011b)-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 reopens 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 and Marantz (1993) when they introduced the theory. Our arguments have been based on empirical facts from different syntactic constructions crosslinguistically (e.g., Root suppletion and hyponymous objects in NI 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 question that we leave open to future research is this: 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.

First, the narrow syntax could contain Roots with their full semantic (conceptual) content, but not actual VIs with phonological content. This kind of theory is proposed in Pfau 2009 and has been largely adopted in such work as Siddiqi 2009. 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.

Second, it is conceivable that the narrow syntax does only contain and manipulate universal conceptual information, as Halle and Marantz (1993) supposed. Under such a theory, the narrow syntax could contain only universal conceptual information, including such abstract syntactico-semantic features as [3rd person], [ $\pm$  animate], [ $\pm$  human]. 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  $\sqrt{\text{OCELOT}}$ .

Third, it is also conceivable that Roots in the narrow syntax are devoid of all content, both conceptual and phonological. Harley (2011b) proposes a theory along these lines, where Roots are necessarily individuated via an index, but they do not associate with semantic or phonological 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<sub>142</sub>:/OCELOT/) is inserted from the Vocabulary list postsyntactically 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 necessitates 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 must leave the solution to this crucial problem open for future research.

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(Haugen)

Department of Anthropology  
Oberlin College  
10 North Professor Street  
Oberlin, OH 44074  
[jhaugen@oberlin.edu](mailto:jhaugen@oberlin.edu)

(Siddiqi)

School of Linguistics and Language Studies  
Institute of Cognitive Sciences  
Carleton University  
215 Paterson Hall  
1125 Colonel By Drive  
Ottawa, Ontario K1S 5B6  
Canada  
[daniel\\_siddiqi@carleton.ca](mailto:daniel_siddiqi@carleton.ca)

