

Revisiting Revived *Syntactic Structures*: The Extended Hybrid Approach to Verbal Morphology

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Abstract

Lasnik's (1995b) hybrid account for English verbal morphology has been shown to be superior to the alternative lexicalist account (Chomsky, 1993), though it has suffered from some conceptual and empirical problems. This paper proposes to extend the hybrid-ness of Lasnik's analysis by revising one aspect of his proposal: lexical items can be affixal and featural simultaneously, thereby ensuring that the same category has the same set of formal features. This revision and its extension to modals brings about desirable conceptual and empirical consequences. First, it eliminates the Stranded Affix Filter (SAF) by attributing SAF effects to the timing of feature checking. Second, this solves two empirical problems observed for Lasnik's system, namely, a) in VP ellipses, stranded *ing* is disallowed due to the SAF but stranded *en* is not, and b) it overgenerates a sentence like *It does not be raining*.

Introduction

Analyses of verbal morphology have played pivotal roles in syntactic theories since Chomsky (1957), as evident in proposals such as affix hopping (Chomsky, 1957), head movement (Emonds, 1978), split IP (Pollock, 1989) and strong vs. weak feature distinction (Chomsky, 1993. See Lasnik, 2000 for a review of these proposals). Lasnik (1995b) proposed a hybrid approach to English verbal morphology, which essentially blends two opposing positions on how verbal morphology is realized. He adopted the affix hopping analysis (Chomsky, 1957) for lexical V_s (i.e., verbs other than *have/be*), arguing that lexical V_s are stored in bare form in the lexicon, and verbal affixes are introduced separately and attached to the bare V_s. On the other hand, Lasnik argued for a lexicalist position on verbs that undergo raising such as *have/be*, that is, they are stored in inflected form with relevant features that need to be checked, and these features are checked by head movement in overt syntax. Although this hybrid approach was fairly successful in explaining the distribution of *do*-support, verbal affixes as well as the positional differences between *have/be* and lexical V_s, it has been challenged by some empirical problems.

The goal of this paper is to overcome these problems without changing the essence of Lasnik's system. Specifically, I propose to extend the hybridness of

Lasnik's system by eliminating the assumption that affixal and featural items are in complementary distribution. In the remainder of the paper, I will show how this revision and its extension to the modals can solve the conceptual and empirical problems pointed out for Lasnik's system.

The organization of this paper is as follows. In Section 1, I will present a summary of Lasnik's hybrid account of English verbal morphology. Section 2 presents two major empirical problems that have challenged Lasnik's theory. These are a) *en vs. ing* asymmetry in stranded affix filter effects under VP ellipsis and VP fronting (Lasnik, 1995b; Oku, 1998), and b) overgeneration of a sentence like **It does not be raining* (Lasnik, 2000). In Section 3, I will present slight modifications to the hybrid approach that will allow us to solve these problems, and illustrate how the revision can solve the two problems. This section also discusses a potential learnability problem for the hybrid account, and suggests what needs to be encoded in Universal Grammar to overcome this learnability problem. Section 4 concludes this paper.

1 Hybrid Approach to Verbal Morphology (Lasnik, 1995b)

Lasnik's main goal was to explain a) the distribution of verbal morphemes, b) the distribution of *do*-support, and c) positional differences between *have/be* and main Vs in English. His main proposals are summarized in (1).

- (1) Lasnik's hybrid system (based on Lasnik 1995b, 2000, 2003)
 - a. T is freely an affix or a set of abstract features, and finite featural T is strong.¹
 - b. *have* and *be* are fully inflected in the lexicon, whereas main verbs are stored in their bare form.
 - c. Affixal T must PF-merge with V whenever possible, where PF-merger is a PF process demanding adjacency.

Note first that in this system, featural T is not affixal, and affixal T is featureless (i.e., has no formal features that are relevant to V or T heads) (1a).² In other words, featural T and affixal T are in complementary distribution. Next, he also assumes that inflected Vs (i.e., *have* and *be*) possess formal features that are relevant to V or Ts, whereas bare Vs possess no such formal features (1b). Finally,

¹ Lasnik (1995b) uses the notation Infl instead of T, but I will use T throughout this paper without assuming any qualitative differences between the two.

² Even though Lasnik (1995b) was not very clear on this, he did assume that "featureless" heads like bare Vs and affixal Ts have all the other features (Howard Lasnik, personal communication). In the remainder of the paper, I will still use Lasnik's expression "featureless," though the intended meaning is "lack of formal features that are relevant to V-raising."

the PF-merger operation that requires adjacency (1c) is morphophonemic, and not syntactic (Bobaljik, 1994; Halle and Marantz, 1993; footnote 11 in Lasnik, 1981). Theoretically speaking, this system presents four logical possibilities with respect to combinations of T and V, as shown in Table 1.

Table 1. Possible combinations of T and V in Lasnik's system (based on (33) in Lasnik, 1995b)

	Properties of T, V	Derivations
(i) <i>Have/Be</i>	+F, +F	OK. V will overtly raise.
(ii) Main V	Af, bare	OK. PF-merger.
(iii) Crash 1	+F, bare	*at LF, since +F of T will not be checked. *at PF, since +F is strong
(iv) Crash 2	Af, +F	*at LF, since +F of V will not be checked. *at PF, if merger fails.

Let us examine each combination in turn. When both T and V are featural (represented in the table as “+F”, following Lasnik (1995b)), V will overtly raise and check these features (type (i) in Table 1).³ It is assumed that this feature checking occurs via verb raising and adjunction to T, and it follows from this that Vs such as *have/be* which show overt raising from V to T (Emonds, 1978; Pollock, 1989; cf. Freidin, 2004; Ouhalla, 1990) are featural in English. This explains the distribution of *have/be* in (2): In (2a) and (2c), featural *have/be* are overtly raised to check the features of T and hence the derivation converges, but in (2b) and (2d), the features of T remain unchecked and hence the derivation crashes.^{4,5}

- (2) a. [TP John [T' has₁ [NegP not [VP t₁ been smart]]]]
 b. *[TP John [T' T [NegP not [VP has been smart]]]]
 c. [TP John [T' is₁ [NegP not [VP t₁ smart]]]]

³ Lasnik (1995b) seems agnostic on exactly what feature is involved in these feature checking operations, though inflectional features (p. 259) and V-features (p. 261) were suggested as relevant features. I will return to this point later.

⁴ Here, it is assumed that *have* and *be* are V (Ross, 1969) rather than Aux (Chomsky, 1957).

⁵ Following Pollock (1989), I assume in this paper that NegP is located between IP and VP and hence can be used to diagnose the height of relevant verbal lexical items.

- d. * $[_{TP} \text{John } [_{T'} T [_{NegP} \text{not } [_{VP} \text{is smart}]]]]]$

The type (ii) in Table 1 represents the cases where derivations with main Vs converge: Main Vs are stored in bare form in the lexicon (1b) and, unlike *have/be*, they are featureless. T is affixal and hence featureless, and as long as T and V are adjacent, this affixal T can PF-merge with Vs and be realized as tense/agreement morphemes (1c). Now let us examine how this accounts for the distribution of verbal morphemes in (3) and (4).

- (3) a. John left.
b. John affixal-T leave

- (4) a. *John not left.
b. *John left not.
c. John did not leave.

- (5) $[_{TP} \text{John } [_{T'} \text{affixal-T } [_{NegP} \text{not } [_{VP} \text{leave}]]]]]$

In (3), affixal T and V *leave* are adjacent (3b), and this is why affixal T can merge with V at PF (3a). In (4), since *left* is not stored in the lexicon while the affixal T and *leave* are not adjacent (5), (4a) cannot be generated.⁶ Since main Vs and affixal T are featureless, nothing triggers head movement in this derivation, barring (4b) for reasons of economy. The only grammatical derivation is (4c), in

⁶ This may naturally raise a concern about why adverbs do not seem to block affix hopping (i), where *quickly* seems to be a VP adjunct and hence intervenes T and V:

- (i) Bill quickly ate his lunch.

Lasnik (2003) addresses this concern and argues based on (ii) that even the ‘low’ adverbs like *completely* may be in a higher position than it appears, probably adjoined to TP:

- (ii) John partially lost his mind, and Bill completely did.

However, as Ochi (1999) and Stepanov (2001) point out, this does not solve the problem entirely, since these adverbs can appear low (iii), and if so, we must account for why (iv) is impossible:

- (iii) Bill $[_{TP} \text{did not } [_{VP} \text{completely } [_{VP} \text{lose his mind.}]]]$
(iv) *Bill $[_{TP} \text{did } [_{VP} \text{completely } [_{VP} \text{lose his mind.}]]]$

Here, I adopt Ochi’s (1999) proposal that is based on multiple spell-out and Stepanov’s (2001) idea that adjuncts without unchecked features *must* be inserted postcyclically. This way, T and V can be adjacent after one cycle and hence affix hopping is allowed, and then during the next cycle adverbs can be inserted into a position between T and V.

which the main V remains in situ and *do*-support applies to the affixal T. Note that in Lasnik's system, *do*-support is not a last-resort transformational operation (Chomsky, 1957), but simply an emergence of the phonological form of affixal T when it is stranded (see p. 193 in Lasnik, 2000).⁷

How about (iii) and (iv) in Table 1? They represent the cases where derivations crash since certain features remain unchecked. In (iii), T possesses certain features that need to be checked, but they remain unchecked (at PF or LF) since V does not have relevant features. In (iv), V has some features that need to be checked, but since T does not have relevant features, they remain unchecked and the derivation crashes. On the PF side, the affixal T cannot be hosted by featural V, and hence the derivation crashes at PF as well. Notice now that Lasnik is assuming that features on both T and V need to be checked in some way, therefore allowing only 'all or nothing' derivations in terms of features of T and V: (i) is fine because both T and V have relevant features; (ii) is fine because neither of them has formal features, and featureless bare forms can host affixes. I will come back to these assumptions about feature specifications in Section 3.

Lasnik can thus explain the distribution of English verbal morphology by the proposal in (1). What is unique in his analysis is the dichotomy between *have/be* and main Vs in terms of presence or absence of features and ability to host affixes, and he derived this dichotomy by proposing that *have* and *be* are inflected in the lexicon (and hence have features but cannot host affixes) and that main Vs are not (and hence they cannot check features but can host affixes). Lasnik provides additional empirical support for this proposal by using the VP ellipsis paradigm (6) and (7), originally discussed in Warner (1986).

- (6) a. John slept, and Mary will sleep too
 b. John slept, and Mary will ~~sleep~~ too
- (7) a. John was here, and Mary will be here too
 b. *John was here, and Mary will ~~be here~~ too
 c. John must be here, and Mary should ~~be here~~ too
 d. John has left, but Mary shouldn't have left
 e. *John has left, but Mary shouldn't ~~have left~~
 f. ?John could have left, but Mary shouldn't ~~have left~~

⁷ *Do*-support applies only when PF merger fails to apply. This may be because morphological concatenative operations must apply before determining how words are pronounced: e.g., how to pronounce *kick+ed* can be determined only after *ed* merges with *kick*. In this sense, whether to pronounce the affixal T as *do* or a verbal suffix must follow an operation like PF merger. Note also that I will still use the term *do*-support in this paper, although it is characterized differently from the original one.

(6) shows that VP with *slept* can license the ellipsis of VP *sleep* even though the forms of the verbs are different. On the other hand, the contrast between (7b) and (7c) as well as the contrast between (7e) and (7f) demonstrate that auxiliaries *have/be* in the antecedents and ellipses need to be identical in form. This is summarized as Warner’s generalizations (8).

- (8) a. **Warner’s Main Verb Generalization:** In cases of ellipsis of a VP headed by a main verb, the verb need not have the same morphological form as its antecedent.
 b. **Warner’s Auxiliary Verb Generalization:** In cases of ellipsis of a VP headed by an auxiliary verb, the auxiliary must have the same morphological form as its antecedent.⁸

On the assumption that PF deletion operations like VP ellipsis are licensed under form identity (e.g., Chung, 2005; Lasnik, 1995b; but cf. Merchant, 2001), (8a) may seem rather mysterious. However, Lasnik argues that this is exactly predicted by his theory, since main verbs are inserted in their bare form, and acquire their affixes only at PF. Let us examine (9), the pre-Spell-Out representation of (6) above.

(9) John T *sleep*, and Mary will *sleep* too

⁸ Potsdam (1997) claims that Warner’s Auxiliary Verb Generalization is only a tendency, as the acceptability relatively improves when the antecedent contains a non-finite auxiliary (though he concedes that judgments are inconsistent and variable). Some of his examples are given in (i).

- (i) a. John is being examined but Jack really should ~~be examined~~ also.
 b. He might be attending AA sessions, I know his mother has ~~been attending AA sessions~~.
 c. John may be questioning our motives but Peter hasn’t ~~been questioning our motives~~.

Based on such judgment inconsistencies, he argues that the source of degradation in (7b, 7e) is due to processing difficulties in recovering the semantic information of the elided VP (what he terms VPE processing principle). However, if there is a somewhat systematic difference in acceptability of VP ellipses when the antecedent is headed by a finite auxiliary and when it is headed by a non-finite auxiliary, it is not clear how this asymmetry can be captured under Potsdam’s VPE processing principle. Moreover, Chizuru Nakao (personal communication) points out that the acceptability may be predicted by Lasnik’s theory: the form identity still holds in (ia) if *being* is derived from a PF merger of *ing* to *be*. In (ib), the identity still holds if the elided VP was *attended AA sessions*, though it is not clear whether Potsdam made sure that the progressive meaning is retained in the elided VPs. The same point holds for (ic), since stranded *en* does not lead to ungrammaticality (see Section 2 for details).

[before Spell-Out and PF deletion]

As (9) clearly shows, the verbs are in identical form before PF-merger occurs, and therefore the VP ellipsis in (6) is licensed.⁹

Lasnik further argues that the strict form identity requirement on *have/be* (8b) also follows from his theory, as it claims that *have/be* are already inflected in the lexicon, and therefore the forms need to be strictly identical in the ellipsis and its antecedent (7).¹⁰

Lasnik also shows that the other affixes proposed in Chomsky (1957), namely *en* and *ing*, could also be retained in his theory. Putative evidence for this claim comes from VP ellipses again. (11a) is bad even though the main V *sleep* is in identical form before PF-merger, which was observed above to be sufficient for VP ellipsis licensing. Lasnik argues that the ungrammaticality results from the stranded affix filter (SAF, Lasnik, 1981), defined in (10): as shown in (11b), *was* is inserted together with *ing* (as *be+ing*. cf. *have+en*, which we will return to in Section 2.2), as proposed in Chomsky (1957), and since the VP ellipsis deleted the potential host for it, *ing* was stranded in violation of the SAF (11a).¹¹

⁹ This makes certain timing assumptions about PF merger and PF deletion, that is, PF deletion (or at least its form identity calculation) occurs before PF merger, since form identity does not obtain after PF merger occurs (see Akmajian and Wasow, 1975, for the earliest discussion of this issue). It is not clear how such ordering is to be derived. Possibly, it may be useful to understand this problem in terms of the nature of morpho-phonological operations: It is necessary to determine what is to be pronounced at all before considering where affixes are attached. Together with the discussion in footnote 7, I will assume throughout the rest of the paper that the relevant PF operations are ordered as shown in (i):

(i) PF deletion → PF merger → Pronunciation of affixal lexical items

¹⁰ Potsdam (1997) and Roberts (1998) proposed an alternative account of the VP ellipsis paradigm, but see Lasnik (1997) for arguments that these alternative proposals actually do not work even for the data that they presented as supporting their accounts. See also Oku (1998) for an LF copy account.

¹¹ Potsdam (1997) presented some data (i) that seem to go against Lasnik's argument that stranded *ing* leads to SAF violation, and argued that the unacceptability of sentences like (11b) follows from processing difficulties (see footnote 8), since providing more contextual cues seems to improve the acceptability (i).

- (i) a. Why don't you sit quietly? I am *sitting* quietly
b. "I must see you alone," she said. "You are ~~seeing me alone~~," his uncle said.
c. John said that he would never take money on the side but I knew he was ~~taking money on the side~~
d. John left because Mary was *leaving*.

My informants vary in their judgment on these sentences. Since the facts are not clear, I will not

- (10) Stranded Affix Filter (SAF)
 A morphologically realized affix must be a syntactic dependent of a morphologically realized category (at surface structure).¹²
- (11) a. *John slept, and Mary was (*ing*) too.
 b. John T sleep, and Mary was *ing* ~~sleep~~ too.

In summary, resurrection of the affix hopping approach seems to be quite successful in accounting for all the VP ellipsis paradigms in addition to the distribution of verbal morphology. However, despite such wide empirical coverage of Lasnik (1995b), it has been pointed out that there are some empirical problems that challenge this theory. I will turn to these problems in the next section.

2 Empirical problems with Lasnik's theory

2.1 *en* vs. *ing* Asymmetry in SAF Effects Recall now that stranded *ing* seems to violate the SAF (11), repeated here as (12). Now contrast this to (13), where *en* is stranded after a VP ellipsis applies. As Lasnik (1995b) shows, surprisingly, there is no such SAF effect in (13).

- (12) a. *John slept, and Mary was too.
 b. John T sleep, and Mary was (*ing*) ~~sleep~~ too.
- (13) Peter saw your parents last week, but he hasn't (*en*) ~~see your parents~~ since.

Oku (1998) also discusses a similar paradigm using VP fronting: stranded *ing* is ruled out (14), whereas stranded *en* does not seem to be problematic (15).¹³

- (14) Bill said he would smile at whoever he would look at, and...
 a. ...[smiling at whoever he looked at]₁, he was t₁.

discuss these data sets in the rest of the paper, assuming that Lasnik's observation is correct.

¹² Originally, SAF was defined as an S-Structure condition, which worked fine with the Chomskian view that affix hopping is a transformation. However, under the revised definition of affix hopping as PF merger, Lasnik needs to assume that the SAF is a condition on the PF representations.

¹³ Examples in (14) and (15) are my own, but my informants' judgment replicated the ones given to similar sentences in Oku (1998). Note that the one without a stranded affix (15a) is actually somewhat degraded. I will return to this in Section 3.

- b. *...[smile at whoever he looked at]₁, he was (ing) t₁.
- (15) Bill (had) said he would smile at whoever he would look at, and...
- a. ? ...[smiled at whoever he looked at]₁, he has t₁.
- b. ...[smile at whoever he looked at]₁, he has (*en*) t₁.

Lasnik (1995b) suggests in passing that *en* may simply have an option to be phonologically null. However, this would predict that (16) should also be fine, where *en* is merged with V but receives no pronunciation.

- (16) *John has smile+~~*en*~~ at whoever he looked at.
(meaning “John has smiled at whoever he looked at”)

Thus, Lasnik’s suggestion does not provide a principled account for the *en* vs. *ing* asymmetry in SAF effects.¹⁴

2.2 How to Prevent *It does not be raining Lasnik (2000) points out that in certain contexts, *have/be* can surface in bare form (17), and that they therefore must also have the option of being bare (and featureless) in the lexicon, just like main Vs.

- (17) a. It must be raining now.
b. It must have rained.

However, once we allow *be* and *have* to be bare in the lexicon, then there is no apparent reason why (18) should be bad, where bare *be* is inserted and *do*-support applies to affixal T.

- (18) *It does not be raining

So long as we assume that *have/be* can be either featural or bare, then there seems to be no way to prevent the grammar from generating (18).¹⁵

¹⁴ A more accurate characterization seems to be that *en* can be phonologically null only when it is stranded. However, it is not made clear in Lasnik (1995b) how to motivate such restrictions. I will return to this point in Section 3.

¹⁵ Various attempts to explain (18) with an economy condition have been made. Chomsky (1991) claimed that language-specific operations may be more costly than universal ones, though it seems rather stipulative. Freidin (2004) suggested morphological economy (cf. Emonds, 1994), which compares e.g. (18) against (i) and chooses a morphologically simpler derivation, i.e., (i).

(i) It is not raining

Summarizing so far, despite the empirical support from the VP ellipsis and fronting paradigms discussed in Section 1, the PF-merger analysis of *ing* and *en* was left with a rather puzzling asymmetry in SAF effects. Attributing this asymmetry to some special lexical property of *en* affix does not seem to solve the problem entirely, as discussed in Section 2.1. Furthermore, the core distinction between *have/be* and main Vs with respect to their forms in the lexicon is called into question by the overgeneration problem discussed in Section 2.2.

So, where shall we go from here? One possible direction is to reconsider Lasnik’s proposals regarding the stored forms of *have/be* and main Vs, as well as the idea that affixes are attached to Vs by PF-merger.¹⁶ However, recall that these very proposals led to various desirable empirical consequences (e.g., VP ellipsis paradigm). Thus, it seems useful to retain the basic assumptions of Lasnik’s theory, while modifying part of the theory that is directly relevant to the two problems above, i.e., how to deal with the bare forms of *have/be*, and lexical properties of *ing* and *en*.¹⁷ This is what I will attempt to do in the next section.

3 Feature-based reanalysis of the hybrid approach

3.1 Revisiting Lasnik (1995b) and Chomsky (1993) In this section, I will propose slight modifications to Lasnik’s theory, mainly incorporating Chomsky’s (1993) feature system, so as to account for the problems reviewed in Section 2. Before we do this, let us revisit the details of V and T as well as their featural and affixal properties. This was summarized in Table 1, repeated below.

Table 1. Possible combinations of T and V in Lasnik’s system (based on (33) in Lasnik, 1995b)

If this is an economy condition, then one would expect that this holds for any human language. However, there are languages (colloquial German (ii), Dutch dialects, 16th century English, etc.) which have so called “spurious *do*” discussed in Schütze (2004), which is like an optionally inserted *do*-support without any semantic consequence (e.g., no emphatic meaning is added). The fact that this is optional is very hard to capture under such an economy approach.

- | | | | | | | |
|------|----|--------------------|-------|-----|------|-------|
| (ii) | a. | Sie | liest | ein | Buch | |
| | | She | reads | one | book | |
| | b. | Sie | tut | ein | Buch | lesen |
| | | she | does | one | book | read |
| | | “She reads a book” | | | | |

¹⁶ See Omaki (in progress) for an alternative non-lexicalist approach to the distribution of verbal morphology and VP ellipsis paradigm.

¹⁷ Freidin (2004) proposes an alternative system using a lexicalist approach. Going over his theory is beyond the scope of the paper and thus left out, but I will note here that his account cannot account for the VP ellipsis and fronting paradigms, which lent crucial support for Lasnik’s theory.

	Properties of T, V	Derivations
(i) <i>Have/Be</i>	+F, +F	OK. V will overtly raise.
(ii) Main V	Af, bare	OK. PF-merger.
(iii) Crash 1	+F, bare	*at LF, since +F of T will not be checked. *at PF, since +F is strong
(iv) Crash 2	Af, +F	*at LF, since +F of V will not be checked. *at PF, if merger fails.

Let us now discuss some peculiarities of Lasnik's system. Firstly, recall now that Lasnik's theory enforces 'all or nothing' requirements on features on T and V: the derivation converges when both of them have the relevant features (i), or neither of them has any features (ii). However, as Freidin (2004) points out, it is rather stipulative that V or T features are simply absent when the verb is bare or T is affixal. It seems to be much more uniform and simple if Vs and Ts had the same set of features regardless of their lexical forms.

Secondly, it is not so clear why affixal T cannot have formal features. If affix hopping should be reanalyzed as a PF operation, as Lasnik and others suggest, does this entail that the affixal head cannot have formal features? It is true that none of the past theories proposed that these two properties coexisted in one lexical item, but it also seems perfectly reasonable to assume that the affixal property is just one piece of phonological information in a lexical item (just like phonological information about how to pronounce it), and that formal features exist in it independently. In the similar vein, there seems to be no a priori reason why bare Vs cannot have formal features. The reason why Lasnik proposed this complementary distribution between T/V with features and T/V without features was probably to retain the theoretical assumptions of the affix hopping approach (which made use of no features; Chomsky, 1957) and lexicalist approach (which assumed that inflected verbs have features; Chomsky, 1993), as well as to motivate the complementary distribution of *have/be* raising and PF-merger of T.

However, if we dispense with the assumption that bare Vs and affixal heads cannot have features, and instead come up with feature specifications of V and T that can derive the distribution of PF-merger and verb raising, then we can also address Freidin's concern discussed in the previous paragraph without losing the empirical coverage. Note here that this revision still allows us to retain

Lasnik's insightful suggestions, such as that a) (affixal) T is pronounced as *do* when it is not adjacent to verbs, and b) *have/be* and main Vs are stored in inflected forms and bare forms, respectively, since these properties are not tied in with Lasnik's assumption about featural and affixal heads, which we are now attempting to discard. This allows us to maintain Lasnik's account for the distribution of *do*-support and (most of the) VP ellipsis and fronting paradigms.

Let us now re-interpret Lasnik's analysis of T and V in Chomsky-like V and T feature specifications.¹⁸ First, I assume that in English, T has a weak, uninterpretable V-feature (i.e., weak [-V]) and an interpretable T-feature (i.e., [+T]), and the former needs to be checked by [+V] in V, either overtly or covertly. If V has [+V] and strong [-T], then V raises overtly to T to check [-T] while checking T's [-V], hence the derivation converges.¹⁹ This is the case of *have/be* raising. If V has a [+V] and weak [-T], then feature checking occurs covertly due to Procrastinate (Chomsky, 1993), hence the derivation converges here too. The taxonomy of these features is summarized in (19).²⁰

- (19) T: weak [-V], [+T], affixal
Have/be: [+V], strong [-T]
 Main Vs: [+V], weak [-T]

Note that in this system, I depart from Chomsky (1993, 1995) in that strong features can be on the source or the target of movement, an idea embraced in Lasnik (1995a, 1999). Although we are now going back to a Chomsky-like feature system that had difficulties accounting for English verbal morphology (see Lasnik, 2000 for review), I will show that retaining parts of Lasnik's proposal and combining it with Chomsky's feature system gives rise to a number of desirable empirical consequences.

Now, taking Lasnik's proposal of *do*-support that it is how (affixal) T is pronounced, we also assume (20) (see also footnotes 7 and 9).

- (20) T is pronounced as *do* when:
 a. it does not PF-merge with V, and
 b. no verb moved into T.

¹⁸ In the current paper, I am sticking to the view that head movement is (at least partially) syntactic (Chomsky, 1993), rather than the view that holds head movement to be a PF operation (Chomsky, 2000). See Matushansky (2006) and Zwart (2001) for conceptual and empirical arguments against the latter approach (but cf. Boeckx & Stjepanović, 2001).

¹⁹ Note that the overt checking of weak [-V] in T does not violate Procrastinate, since otherwise the derivation would not converge due to V's strong [-T].

²⁰ See LaPorte-Grimes (2001) for a somewhat similar feature-based approach.

Can we capture the distribution of *do*-support with (20)? If *have/be* raise to T to check their strong [-T], then T is pronounced as *have/be* (with appropriate tense and agreement): if not, the strong feature in V is spelled out, so the derivation will crash at PF. If we have main verbs, then verbs must not raise overtly due to Procrastinate, but rather check the [-V] on T covertly. If T is adjacent to V, T undergoes PF-merger with V, and if not, T is pronounced as *do*, according to the piece of phonological information that is encoded in the lexical entry of T.²¹

So far, we have not lost Lasnik's empirical coverage regarding V and T. Let us extend the current analysis to *ing* and *en*, considering the *ing* vs. *en* asymmetry in SAF effects discussed in Section 2.1. I propose here that the asymmetry follows from the following feature specifications of the two affixal elements: *ing* has strong [-V], whereas *en* has weak [-V], though they are both affixal. Following Lasnik (2000), let us assume the hierarchical order among these verbal constituents to be as shown in (21), and consider the bottom-up derivation of *John has been sleeping*.^{22,23}

(21) [_{VP1} have [_{enP} en [_{VP2} be [_{IngP} ing [_{VP3} sleep]]]]]

First, the VP headed by *sleep* merges with *ing*. At this point, *sleep* must raise to *ing* head so as to check its strong [-V] feature.²⁴ As for *en*, it has a weak [-V] feature, so it is not checked until after Spell-Out. However, *be* is adjacent to *en*, and the PF-merger of *en* to *be* occurs after Spell-Out. Crucially, however, the checking of the [-V] feature of *en* does not occur until LF, even though the *en* and

²¹ One may question how (or whether) PF can see categorial information (V, T, etc.) such that T can correctly target V in the process of PF merger. Howard Lasnik (personal communication) suggests that there are other cases where phonology needs such categorial information: For example, a word *contrast* is pronounced differently depending on whether it is N or V, which suggests that categorial information may be visible to PF operations (Chomsky and Halle, 1968).

²² I will later return to the issue of when bare forms of *be* and *have* can appear, as well as their behavior when selected by modals.

²³ Here I remain agnostic as to how this ordering is to be implemented (cf. Freidin, 2004), though it is worth noting that we could enforce such ordering in virtue of feature checking (e.g., *be* has a feature that needs to be checked by a feature in *ing*, etc.). See Svenonius (1994) for such a proposal, and Matushansky (2006) for a discussion on how c-selection based on features can derive such locality constraints as Head Movement Constraint in terms of minimality condition.

²⁴ One may argue that this account predicts that *ing* should be able to raise overtly to *be* to check its strong [-V] feature, contrary to fact. We could possibly prevent such derivations by assuming an economy principle like *ASAP* (Yang, 1997, cited in Collins, 2001), which essentially enforces feature checking as soon as possible, such that the [-V] feature must be checked by overt raising of *sleep* in (21). Note however that Chomsky's (1995) approach that strong features must be checked immediately (the virus theory; see Lasnik, 1999) is incompatible with the current analyses.

V are PF-merged and look as if the feature of *en* was checked before Spell-Out (as in the traditional account).²⁵ Thus, we can derive the SAF effects derivationally by using strong features.

Now let us consider how this proposal accounts for the VP ellipsis and fronting paradigms discussed above. First, consider the derivation of a sentence with a VP ellipsis with an elided progressive (12), repeated below as (22).

- (22) a. *John slept, and Mary was too.
 b. John T sleep, and Mary was (*ing*) ~~sleep~~ too.

Recall that we are assuming a form identity condition on ellipsis licensing. Due to this requirement, VP ellipses are not licensed when the forms of the verbs in both conjuncts are not identical before the PF-merger of affixal lexical items. In (22b), the progressive *ing* is introduced, which has a strong [-V] feature, and this essentially enforces overt verb raising before Spell-Out, as shown in (23).

- (23) *John T sleep, and Mary was [_{IngP} [sleep]_I-ing [_{VP} t_I]] too.

It follows from this that the form of the verb is not identical in the first conjunct (i.e., *sleep*) and the second conjunct (i.e., *sleeping*), and for this reason the VP ellipsis in (22) is not licensed.²⁶ On the other hand, if *sleep* does not overtly raise, then the strong feature will remain unchecked, hence the derivation crashes at PF.

²⁵ I assume that negation *not* is introduced above the VP headed by *have*, such that the adjacency between *en* and *be* is not blocked in a sentence like (i).

- (i) John has_i not t_i en be ing eat (i.e., “John has not been eating.” at PF)
 (ii) John may have not been eating.

Norbert Hornstein (personal communication) points out that *not* can appear below *have* even though *have* does not raise due to the presence of modals (ii). I tentatively assume that this sentence involves constituent negation of *been eating* rather than sentential negation and leave aside this question. Here, I also leave aside why V-raising of *have/be* do not violate Head Movement Constraint. See Matushansky (2006) for a discussion on this issue.

²⁶ Norbert Hornstein (personal communication) points out that if we assume that V-raising leaves a copy behind, then the following sentence should be grammatical, contrary to fact:

- (i) a. *John ate a banana, and Bill was eating, too [meaning: “Bill was eating a banana too”]
 b. John T [_{VP} eat a banana], and Bill was eat-ing [_{VP} eat a banana] too

This is indeed a potential problem for the current approach, but investigation of this problem is beyond the scope of this paper. See Omaki (in progress) for an account for this problem based on a different approach to the VP ellipsis paradigm.

Next, consider a derivation of a sentence with a perfective (13), repeated here as (24).

- (24) Peter T see your parents last week, but he hasn't (*en*) ~~see your parents~~ since.

Since *en* has a weak [-V] feature, overt verb raising of *see* does not happen. This ensures that the form of the verb remains bare until the PF-merger of *en*, and assuming that the VP ellipsis applies before the PF-merger as discussed above, the form identity condition on verbs in both conjuncts is satisfied (i.e., they are both *see*). This explains why the VP ellipsis in (24) is licensed.

However, we do need to say something about the SAF, which was supposed to rule out stranded affixes. Here, I propose to dispense with the SAF entirely: there is no representational condition that bans stranded affixes. Recall, for example, that I adopted Lasnik's analysis that affixal T that cannot go through PF-merger simply receives some pronunciation, and thus there is no need for a filter with respect to this affix, contra Lasnik (1981). Moreover, with respect to *ing*, we derived the SAF effect by means of its strong feature. Thus, we do not need the SAF to explain the ungrammaticality of (22). Finally, eliminating the SAF can correctly explain why (24) is grammatical: stranded affixes are not ruled out by any principle of grammar. We still owe an explanation as to what happens to *en* when it is stranded in (24): by extending Lasnik's analysis of *do*-support to *en*, I propose that *en* receives pronunciation when it is stranded, but its overt pronunciation form is simply null, just like *pro* receives such pronunciation. This allows us to have a uniform characterization of affixes, namely that affixes all receive some pronunciation when they are not affixed.²⁷

Let us now turn to the VP fronting paradigms in (14) and (15), repeated below as (25) and (26).

- (25) Bill said he would smile at whoever he would look at, and...
a. ...smiling at whoever he looked at, he was.
b. *...smile at whoever he looked at, he was (*ing*).

- (26) Bill (had) said he would smile at whoever he would look at, and...
a. ? ...smiled at whoever he looked at, he has.

²⁷ Note that the fact that *en* receives null pronunciation when stranded does not entail that it has to be null when it is affixed. This is not a strange assumption, given that PF merger of the affixal T does not produce a form like *leave-does*. In other words, I am assuming that pronunciation of affixes as a dependent morpheme is listed separately from the pronunciation of the affixal heads as a free morpheme.

b. ...smile at whoever he looked at, he has (*en*).

As with the VP ellipsis paradigm, the fact that (25b) was illicit was originally attributed to the SAF violation, but the SAF account had trouble accounting for why (26b) is grammatical, since this sentence also contains a stranded affix. Under the proposed account, this asymmetry is predicted as follows: *ing* in (25) has a strong [-V] feature, requiring pre-Spell-Out feature checking by (and hence overt raising of) V. Thus, only when V overtly raises to *ing* does the derivation converge. Based on the form of the verbs, we can tell that overt raising of V to *ing* occurred in (25a) but not in (25b), as shown in (27). Thus, (25b) is bad not because *ing* was stranded, but because its strong feature was not checked in overt syntax.²⁸

- (27) a. ..._{[IngP [V smile]₂-ing [VP t₂ at whoever he looked at]]₁}, he was <sub>[IngP-
[V-smile]₂-ing [VP t₂ at whoever he looked at]]₁</sub>
 b. *..._{[VP smile at whoever he looked at]₁}, he was <sub>[IngP ing [VP-smile-
at whoever he looked at]₁]</sub>

Similarly, we can account for why both (26a) and (26b) are fine: V will covertly check the weak [-V] feature of *en*, and there is no requirement for overt feature checking. As (28) shows, when EnP is fronted, then PF-merger of *en* to V applies (28a), but if VP was fronted, then *en* is stranded and simply pronounced as null.²⁹

- (28) a. ?..._{[EnP en [VP smile at whoever he looked at]]₁}, he has <sub>[EnP-en [VP-
smile at whoever he looked at]]₁</sub>
 b. ..._{[VP smile at whoever he looked at]₁}, he has <sub>[EnP en [VP-smile at-
whoever he looked at]₁]</sub>

Thus, by employing a more articulated feature system and a set of pronunciation rules for functional heads, we have a) solved one of the empirical problems for Lasnik's theory, and b) reduced the SAF to the interaction of lexical properties (i.e., pronunciation of affixes) and derivational conditions on checking of strong features, without losing the account for the distribution of *have/be*

²⁸ One may argue that deleting *ing* together with its strong features at PF should be able to save the derivation, as discussed in Lasnik (1999). I assume that English does not have a deletion operation that simply targets *ing* just because it has a strong feature, since this could potentially cause a problem of recoverability. See Kim (2005) for a related discussion.

²⁹ I will leave open for future research why (28a) is somewhat less acceptable, though I note that VP fronting may simply be more standard and preferred over EnP fronting. In the case of *ing* in (27), just fronting VP is ungrammatical for other reasons, and this may be why (27a) does not seem as degraded as (28a).

raising, affix hopping and *do*-support. Note also that we are still assuming, as with Lasnik (1995b), that in the lexicon *have/be* are inflected and main Vs are bare, and hence we can account for the VP ellipsis and fronting paradigms as well.

3.2 Analysis of modals and Neg Using the analysis proposed in Section 3.1, let us revisit the other empirical problem discussed in Section 2, namely, how to block a sentence like **It does not be raining*. Here, I will start with the reanalysis of Lasnik's assumption that *be* is a bare form and hence featureless. The modification proposed in the previous section may appear to prevent a sentence like this. *Be* has a strong [-T], and hence it raises overtly to T, resulting in (29). The reason why (29) is still bad may be because it does not have the right phi-features that agree with the subject of a finite clause.

(29) *It be not raining

However, this leads us to question why (30a) with overt raising is bad and (30b) without overt raising is good, if *be* must overtly raise:

- (30) a. *It must be not raining.
b. It must not be raining.

I propose here that a) the *be* and *have* as well as main Vs that are selected by modals have a modal feature [M], and that b) these verbs possess weak [-M] features.^{30,31} Also, given the complementary distribution of modals and T, I assume that when there is a modal lexical item, there is an MP projected in place of TP. The M head then possesses a [+M] feature that can check [-M] features on the lower verbs. With this system, it is trivially easy to explain why *It does not be raining* is bad: *be* has weak [-M] that needs to be checked (covertly), but there is only [+T] but no [+M] feature, and therefore the derivation crashes.³²

Along the same line, I propose that *en* and *ing* have [+Asp], and verbs that are selected by them have [-Asp]. In English, these verbs happen to be in the same form as those that have [-M], namely, the so called bare forms. This way we can

³⁰ In English we just happen to not see any morphological reflexes. I suspect that there are languages in which V and modals show overt agreement.

³¹ Of course, *have* is ambiguous, as it can agree with e.g. 2nd-person subject without modals. Similarly, even though they all sound the same in English, main Vs all have one entry with [+V, -T] and another entry with [+V, -M]. Alternatively, [T] and [M] features are possibly in one lexical entry, but somehow never surface together.

³² Note further that I am assuming that standard modals are not affixal, and hence there is also no option of receiving a pronunciation like affixal T or affixal *en*.

explain why these bare forms can occur after *en* and *ing* and host these affixes (cf. Freidin, 2004), as shown in (31).

(31) $[_{MP} \text{ John must } [_{VP1} \text{ have } [_{ENP} \text{ en } [_{VP2} \text{ be } [_{IngP} \text{ ing } [_{VP3} \text{ sleep}]]]]]]]]]$

Let us explore further empirical consequences of this proposal. I assume that modals like *must* or *may* are inserted straight into the MP above NegP, and they have [+M] features. Together with the fact that English verbs have weak [-M] features, there is no overt verb raising in these cases (32). In this regard, subjunctives may also fall into the same category, in that they require “bare” forms and do not induce verb raising or *do*-support (Lasnik, 1995b), as shown in (33).³³

- (32) a. $[_{MP} \text{ John } [_{M'} \text{ must/might } [_{VP} \text{ be/go swimming}]]]$
 b. $[_{MP} \text{ John } [_{M'} \text{ must/might } [_{NegP} \text{ not } [_{VP} \text{ be/go swimming}]]]]]$
- (33) a. I desire that $[_{MP} \text{ John } [_{M'} \text{ M}_{Subj} [_{VP} \text{ be/go swimming}]]]$
 b. I desire that $[_{MP} \text{ John } [_{M'} \text{ M}_{Subj} [_{NegP} \text{ not } [_{VP} \text{ be/go swimming}]]]]]$

So far, M head seems to have some similar properties to T, in that they both check a corresponding feature on Vs. Then let us ask if M could also have a *do*-support like T, that is, whether there is a null M affix that receives some pronunciation when it is stranded. In fact, Lasnik (1981, 1995b) has shown that imperatives behave like T in this respect (though he did not analyze imperatives as M). Consider (34):

- (34) a. Be careful
 b. *Be not sarcastic
 c. Don't be sarcastic

We cannot tell from (34a) if *be* may be overtly moving or not. But the fact that (34b) is ungrammatical, and that *do*-support occurs in the presence of negation is exactly parallel to the distribution of *do*-support in T, when V and T are not adjacent.³⁴ Together with the fact that the verbs selected in imperatives are “bare,” it suggests that Imperative is an M that has an affixal property.³⁵

³³ Infinitives may also fall into the same category as subjunctives, but since the height diagnosis with negation is rather difficult with infinitives, I will refrain from committing to this possibility.

³⁴ I am assuming that there are a number of *different* Ms: e.g., imperative M is the only M that is affixal, and other Ms are not (see footnote 32).

³⁵ See Bošković & Lasnik (2003) for a proposal that null C in English is also affixal. See also Pesetsky & Torrego (2001) for a related discussion.

Thus, the proposal that modals have M-features and that the “bare” forms such as *be*, *have* as well as main Vs have weak [-M] features successfully accounted for the empirical challenge to Lasnik’s system.

3.3 Learnability issues The proposed system may appear to increase the burden of children learning English, since figuring out the behavior of English verbal morphology would (minimally) involve learning the following (35):

- (35) a. Whether heads are affixal or not.
b. What features they have: T, V, M/Asp, and if they are weak or strong
c. Whether the lexical items that correspond to these heads should be stored in inflected form or bare form.

Among these, (35c) appears to be particularly difficult, given that the surface form with affixes can be either derived from PF-merger or simply inflected in the lexicon.³⁶ The VP ellipsis paradigm as in (7), repeated here as (36), is also not informative on this point, since learning about the inflected lexicon would require children to be exposed to *negative* evidence such as (36b) or (36e), which is simply not available to children. Children may be able to use indirect negative evidence of some sort (i.e., lack of (36b) or (36e) in the input), but to begin with, it is not clear how likely it is for children to be exposed to VP ellipses that would be informative with respect to verbal morphology.

- (36) a. John was here, and Mary will be here too
b. *John was here, and Mary will ~~be here~~ too
c. John must be here, and Mary should ~~be here~~ too
d. John has left, but Mary shouldn’t have left
e. *John has left, but Mary shouldn’t ~~have left~~
f. ?John could have left, but Mary shouldn’t ~~have left~~

However, the situation may not be as bad as it seems: Recall that *have/be* were strong [-T] and went through overt V-raising, whereas main Vs that are stored in bare form were weak [-T] and remained in situ. If it is encoded in UG that lexical items that are strong [-T] must be stored in inflected form, then this learnability problem will be facilitated, as children’s task is simply to figure out

³⁶ Tim Hunter (personal communication) questions why main and auxiliary verbs show common behaviors regarding the inflectional patterns, e.g., the fact that 2nd person and plural inflections are the same, and that 3rd person inflections all contain *-s*. Exploring this issue is beyond the scope of this paper, but see Omaki (in progress) for a discussion.

whether a given verb has [-T] or not, which should be relatively easy to observe since Vs with [-T] must undergo overt V-raising.³⁷ Whether children actually go through such learning processes is left open for future research.

4 Conclusion

In this paper, I reviewed conceptual issues and two major empirical problems challenging Lasnik's hybrid approach to English verbal morphology, and proposed a few modifications to Lasnik's system to solve these problems. The revised hybrid approach essentially preserves Lasnik's two insights that a) *do*-support is a pronounced form of T and *not* derived from a transformation, and b) in the lexicon *have/be* are stored in inflected form and main Vs in bare form, but eliminated the assumption about the complementary distribution of affixal and featural heads as well as featureless bare forms and inflected forms with features. The resulting account which I called the extended hybrid approach can not only solve the two empirical problems for Lasnik's system, but also solved the conceptual problem pointed out by Freidin (2004), showing that retaining the original insights of Lasnik (1995b) can offer a nice Minimalist account for the distribution of verbal morphology and Warner's VP ellipsis generalizations.

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³⁷ Note that overt V-raising can be driven by strong [-V] in T. I remain agnostic as to whether Vs that raise due to such features should also be inflected in lexicon or not.

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