Rise of the Auxiliaries: A Case for Auxiliary Raising vs. Affix Lowering

Abstract[1]

The syntax of auxiliaries has given rise to much discussion in the generative literature (Akmajian & Wasow 1975, Emonds 1978, Akmajian, Steele & Wasow 1979, Pollock 1989, Chomsky 1993, Lasnik 1995, Roberts 1998, Bjorkman 2011). This paper explores the distribution of non-finite auxiliaries in Standard English, in particular the issue as to whether such auxiliaries raise for inflectional purposes or remain in their base positions and have their inflections lowered onto them.

It is shown that auxiliary distribution is not determined by auxiliary type (passive, copular, progressive etc.) as the lowering accounts predict, but by the morphological form that the auxiliary takes. In particular, the auxiliaries *be*/*been* and *being* exhibit significantly different distributional properties over a range of phenomena that are difficult to capture under an affix lowering model, but can be easily explained via an auxiliary raising account. I therefore offer a syntactic account of auxiliary inflections which employs the theoretical uniformity of an Agree-based approach, with the empirical advantages that an auxiliary raising analysis affords. The auxiliary raising system that will be proposed essentially harkens back to Chomsky's (1993) and Lasnik's (1995) approach to the auxiliary system, though with the utilisation of Bošković's (2007) notion of foot-driven movement.

1. Introduction

It is largely accepted that finite lexical verbs in English are unable to raise to T° for tense/agreement and instead have finite inflections somehow lowered onto them.[2] Finite auxiliary verbs however do raise to T° for tense/agreement. This is evidenced in Pollock (1989) by two basic facts: finite auxiliaries precede the marker of sentential negation *not*, whereas lexical verbs do not (see (1)), and finite auxiliaries undergo Subject Auxiliary Inversion (SAI), whereas lexical verbs do not (see (2)). When only a lexical verb is present in such sentences, dummy *do* must be inserted into T° in place of the lexical verb to support finite inflections:

(1) a. Cinderella might not go to the ball.
b. Cinderella has not gone to the ball.
c. Cinderella is not going to the ball.
d. Cinderella was not taken to the ball.
e. Cinderella is not a pumpkin.
f. * Cinderella went not to the ball.
g. Cinderella didn't go to the ball.

(2) a. May Cinderella go to the ball?
b. Has Cinderella gone to the ball?
c. Is Cinderella going to the ball?
d. Was Cinderella taken to the ball?
e. Is Cinderella a pumpkin?

[1] The judgments expressed in this paper are based on the intuitions of a number of native speakers of British English, including that of the author, unless otherwise indicated.

[2] There are various means of achieving this lowering effect, either by downward head movement (Chomsky 1957), Reverse Agree (Adger 2003; Bjorkman 2011; Wurmbrand to appear), covert raising (Chomsky 1993) or PF merger under linear adjacency (Marantz 1988; Bobaljik 1994; Lasnik 1995; Baker 2003). Each of these methods will be discussed at various points throughout the paper.

f. * Bought Cinderella a new slipper?
g. Did Cinderella buy a new slipper?

If finiteness is in some way the trigger for auxiliary movement to T° (and beyond), the question arises, what happens with non-finite auxiliaries, i.e. *have, be, been* and *being*? Do they raise to a functional head to combine with their aspectual inflections in a way similar to their finite forms, or do they remain in their base positions and have these inflections somehow lowered onto them, similar to the lexical verb? This is essentially the debate of whether we have affix lowering or auxiliary raising, which will be the main concern for this paper.

The two analyses make starkly different predictions regarding auxiliary distribution. The affix lowering account, according to which auxiliaries remain in their base positions and have their non-finite inflections lowered onto them, predicts that auxiliary distribution is determined by auxiliary type; that is, whether the auxiliary is copular *be*, passive *be* or progressive *be*. Under the auxiliary raising analysis on the other hand, in which auxiliaries raise to receive non-finite inflections, the distribution of auxiliaries is predicted to be determined by the morphological form that the auxiliary takes; that is, whether the auxiliary is realised as *be*, *been* or *being*.

As will be demonstrated in this paper, auxiliary distribution is in fact determined by morphological form and not by auxiliary type, suggesting that auxiliary raising is the correct approach to English non-finite auxiliaries, as opposed to affix lowering. Specifically, there is a distributional difference across various phenomena within Standard English in which the auxiliaries *be* and *been* behave differently from *being*, irrespective of the auxiliary's origin, i.e. irrespective of whether the auxiliary was originally merged as progressive, passive or copular *be*.

In light of this evidence, I propose an auxiliary raising analysis which is motivated via Agree, but in which the movement is driven by a featural deficiency on the moving element itself, along the lines of Bošković (2007).[3]

The rest of this paper is organised as follows: section 2 outlines the basic structure of the aspectual hierarchy in English. Section 3 discusses the various approaches to the English auxiliary inflectional system, namely the various guises of affix lowering (Chomsky 1957; Adger 2003; Bjorkman 2011; Wurmbrand to appear) and auxiliary raising (Emonds 1978; Pollock 1989; Chomsky 1993; Lasnik 1995), and highlights a number of theoretical disadvantages for each of these systems. Section 4 then presents the empirical disadvantages with the lowering analyses. In light of this, an Agree-based auxiliary raising account is offered in section 5, in which the movement of the auxiliary is motivated by a featural deficiency on the auxiliary itself. Before concluding in section 7, section 6 provides a brief exploration of how the lexical verb might behave under the proposed analysis, and also discusses the two basic accounts that have been proposed for the *be/been* vs. *being* distinction observed in this paper.

[3] Note that the focus of this article is on how non-finite auxiliaries behave in the inflectional system of English. The issue of the lexical verb will take less prominence, though some speculative remarks as to its behaviour will be offered in section 6. The aim furthermore is only to discuss the distribution of auxiliaries, and not the reason for the presence of such verbal items in natural language. A number of works cited in this paper, in particular Bjorkman (2011), go some way towards explaining the purpose of auxiliaries in natural language, and I refer the interested reader to her work.

2. The articulated structure of the middle field

It has been observed by a number of authors (Akmajian & Wasow 1975, Cinque 1999) that the auxiliary and inflectional system of English exhibits a rigid ordering of Modal > Perfect > Progressive > Passive > Lexical Verb:

(3) Cinderella could have been being hassled by her stepsisters.

Any divergence from this hierarchy results in ungrammaticality:

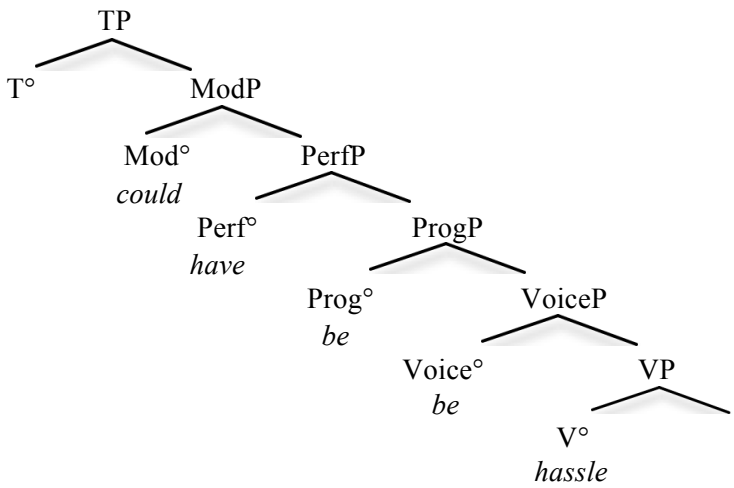
(4) a. * Cinderella must be having been hassled by her stepsisters.
b. * Cinderella has must be being hassled by her stepsisters.
c. * Cinderella is must have been hassled by her stepsisters.

If one takes the stance that auxiliary verbs, like lexical verbs, head their own phrases, then a number of additional projections must be posited between TP and VP to host these items. A number of proposals (cf. Cinque 1999; Bjorkman 2011; Bošković to appear) have led us to the following basic hierarchical structure:

(5) TP>ModP>PerfP>ProgP>VoiceP>VP

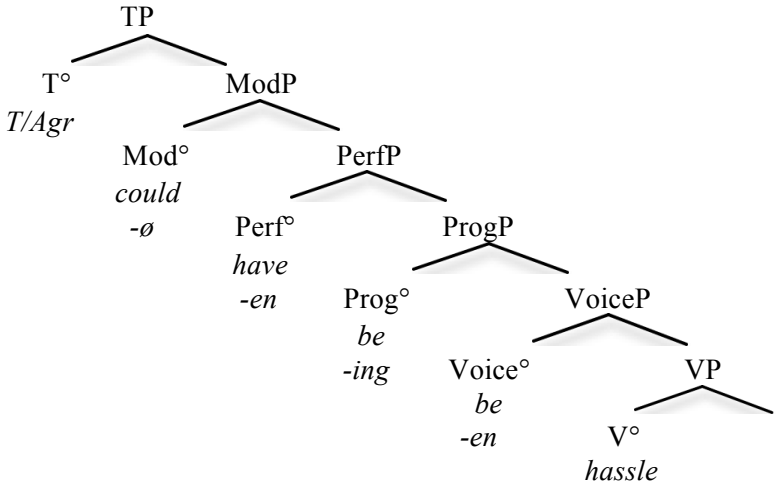
The lexical verb is merged in V°, passive *be* in Voice°, progressive *be* in Prog°, perfect *have* in Perf°, modals in Mod°, and tense/agreement in T°. Given that passive *be* and copula *be* are in complimentary distribution, I also take copula *be* to be merged in Voice° as well (Bowers 2002), though this is not crucial for this article:

(6)



This is a fairly rudimentary hierarchy, and, depending on the stance one takes, there can be more or less structure posited between TP and VP (see, for instance, the cartographic approach of Cinque (1999), or the WYSIWYG approach of Bošković (to appear)). For the sake of simplicity, I refer to the projections between TP and VP as 'aspectual' projections, even though ModP, the projection associated with modal auxiliaries, is typically not considered an aspectual projection. For the time being, I also assume a simplified representation according to which aspectual inflectional affixes are also merged into the heads of the aspectual projections with which they are associated. This is illustrated in (7):

(7)



Obviously, this is a flawed diagram since both inflectional affixes and auxiliary verbs are merged into the same head. This representation is revised in the proceeding sections. However, presently the diagram in (7) suffices to highlight the basic structural hierarchy that this paper is concerned with.

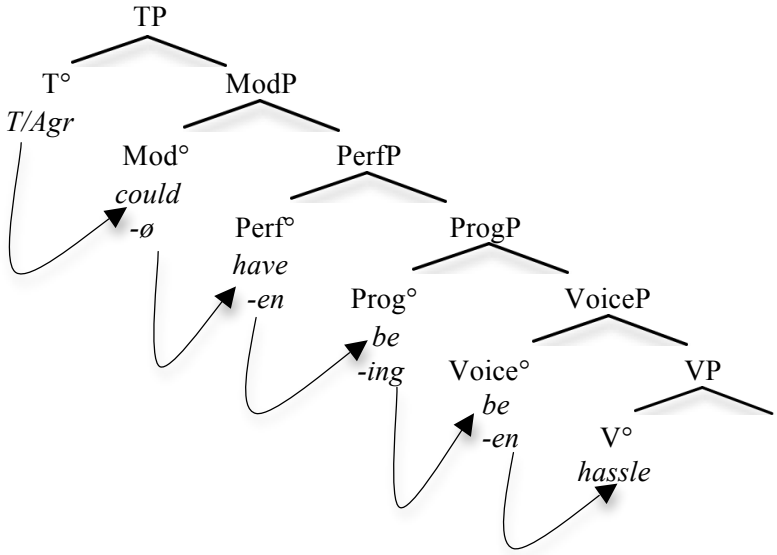
Having established a hierarchy from which to work, section 3 presents an outline of the various analyses that have been proposed for the English auxiliary inflectional system.

3. Analyses of the English auxiliary inflectional system

3.1 Affix Lowering

In Chomsky's (1957) original formalisation of the verbal inflectional system, he conjectured that aspectual inflections surface one position lower than the heads in which they are initially merged, attaching to the following auxiliary or lexical verb. This led Chomsky to propose that verbal inflections are lowered onto the verbs. This mechanism came to be known as Affix Hopping. The diagram in (8) represents the Affix Hopping process itself, whilst the diagram in (9) represents the result of this process.

(8)



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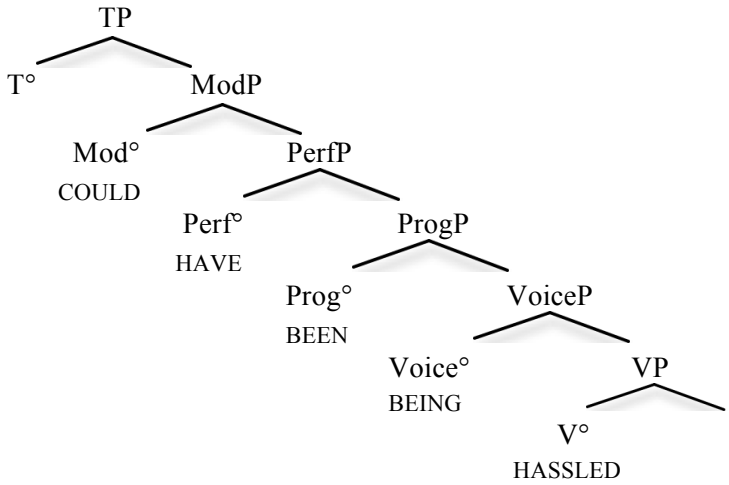


This approach, however, has been largely disregarded due to its violation of the Empty Category Principle (ECP), according to which traces of moved elements must be c-commanded by a higher copy. If an inflection were lowered onto an auxiliary and assuming that it leaves a trace, then that trace is not c-commanded by any higher copy, a clear violation of the ECP.

A more recent instantiation of affix lowering is that of the Reverse Agree approaches proposed by Adger (2003), Bjorkman (2011) and Wurmbrand (to appear), and also implemented by Sailor (2012) and Thoms (2012). Here I outline the common assumptions that unite these approaches.

The standard Minimalist model of Agree, as formulated in Chomsky (2000, 2001), assumes a probe-goal relationship between two items. The higher c-commanding element, the Probe, bears unvalued features, causing it to scan its c-command domain in search of an appropriate Goal with matching valued features. This Goal, once found, would then be able to value the features on the Probe. This can be formulated as follows (Chomsky 2000, 2001):

(10) *Agree*[4]
Agree is a relationship between two features such that an unvalued feature [F:_] receives the value of a feature [F:val] of the same type iff:
a. A head α containing [F:_] c-commands a head β containing [F:val].
b. There is no head γ containing a matching feature [F:(val)], such that γ c-commands β and α c-commands γ.

Essentially, Chomsky's (2000, 2001) version of Agree (hereby referred to as Standard Agree) operates under a configuration in which an unvalued feature c-commands and agrees with a valued feature. A number of authors, however, have proposed the opposite of this model, namely Reverse Agree (Neeleman & van de Koot 2002; Von Stechow 2005; Baker 2008; Zeijlstra 2008, 2010; Aelbrecht 2010; Haegeman &

[4] Chomsky's (2000, 2001) system assumes unvalued features to be uninterpretable, and valued features to be interpretable. In this article, however, I follow the likes of Pesetsky & Torrego (2007) and Bošković (2011) in assuming that interpretable features do not necessarily have to be valued, and uninterpretable features do not necessarily have to be unvalued. This is because the approach to the auxiliary inflectional system that I later propose in section 5 relies upon valued, but uninterpretable, inflectional features.

Lohndal 2010; Merchant 2011; Wurmbrand 2011).[5] In this case, Agree operates in the opposite direction: the unvalued feature agrees with the valued feature c-commanding it. We can formalise this system of Reverse Agree as follows (Bjorkman 2011):

(11) Reverse Agree
Agree is a relationship between two features such that an unvalued feature [F:_] receives the value of a feature [F:val] of the same type iff:
a. A head α containing [F:_] is c-commanded by a head β containing [F:val].
b. There is no head γ containing a matching feature [F:(val)], such that γ c-commands α and β c-commands γ.

This is the system that Adger (2003), Bjorkman (2011) and Wurmbrand (to appear) adopt for the auxiliary inflectional system: essentially tense and aspectual heads, bearing valued inflectional features, value the features of lower auxiliaries, allowing these auxiliaries to remain in a lower position and be spelt out in one of their various inflected forms.

To be more precise, the hypothesis is that T° and all aspectual heads are merged with valued inflectional features whilst auxiliaries are merged bearing unvalued inflectional features. Each auxiliary then agrees with a higher T° or aspectual head, causing the auxiliary to receive the value of the head with which it agrees. Because this agreement between the auxiliary and the higher T°/Aspect° operates under Reverse Agree however, there is no requirement for the auxiliary to raise in order for valuation to take place. Instead the auxiliary is valued in its base position and is spelt out in accordance with the newly acquired value of its feature.[6]

I illustrate how this process works with the maximal configuration of auxiliaries presented in (3), repeated here as (12).

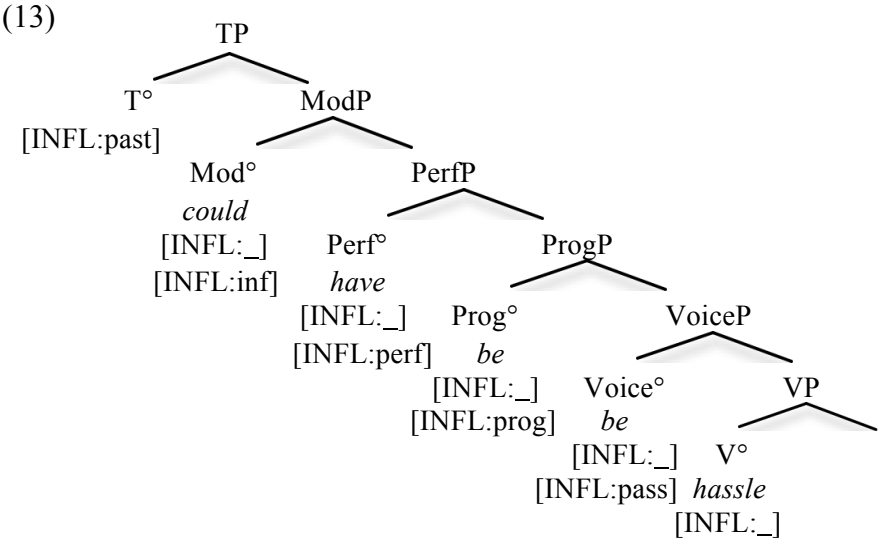
(12) Cinderella could have been being hassled by her stepsisters.

Under the Reverse Agree approaches, the inflectional layer of this sentence would be structured as follows:

[5] Some authors, such Aelbrecht (2010), Haegeman & Lohndal (2010) and Merchant (2011) assume that Reverse Agree is additional to Standard Agree, whilst others, namely Wurmbrand (2011) and Zeijlstra (2008, 2010) have claimed that Reverse Agree is the only possible operation.

[6] Bjorkman's (2011) proposal is somewhat more complex than this, since the Reverse Agree operation actually only takes place between abstract features and the auxiliary is only inserted post-syntactically to host the affix when it cannot attach to the lexical verb.

(13)

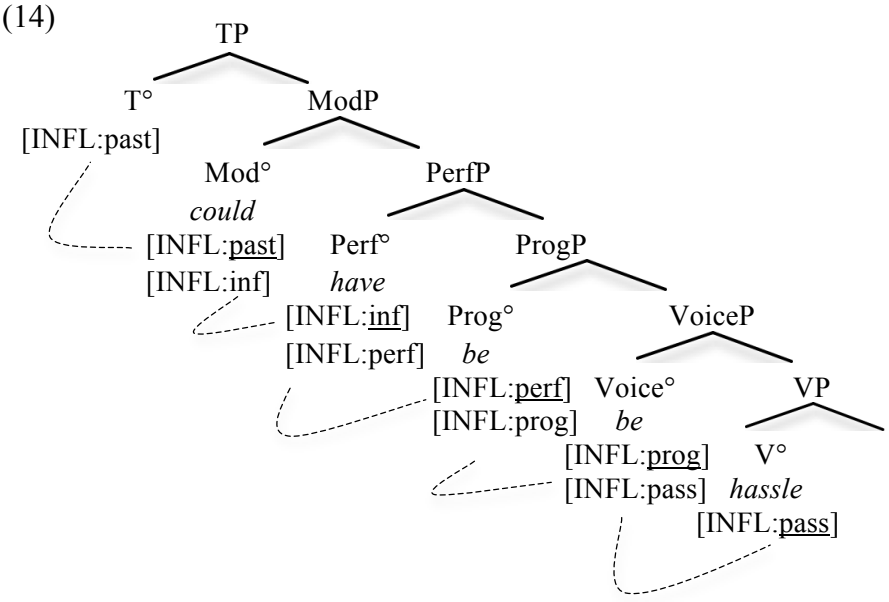


The inflectional system then works accordingly: the first item to be merged into the structure is that of the lexical verb *hassle* in V°, which bears an unvalued inflectional feature [INFL:__]. VoiceP is merged directly above this, bearing a passive inflectional [INFL:pass] feature in its head.[7] Through Reverse Agree with Voice°, the lexical verb remains in V°, but has its inflectional feature valued as passive: [INFL:pass], causing the verb to be realised as *hassled*. The passive auxiliary *be*, bearing an unvalued inflectional feature [INFL:__], is also merged in Voice°, and agrees, via Reverse Agree, with the progressively valued [INFL:prog] feature above it in Prog°. The passive auxiliary subsequently remains in Voice°, and is spelt out as *being*. The progressive auxiliary *be* is merged in Prog° and bears an unvalued inflectional feature [INFL:__] which is valued, via Reverse Agree, as [INFL:perf] by the [INFL:perf] feature above it in Perf°. The progressive auxiliary therefore remains in Prog° and is spelt out as *been*. The perfect auxiliary is merged in Perf° and has its inflectional feature valued by the infinitival [INFL:inf] feature in Mod° above it. The perfect auxiliary thus remains in Perf° and is spelt out as *have*. Finally, the modal auxiliary *could*, bearing an unvalued inflectional feature [INFL:__], is merged in Mod°. TP is merged directly above ModP, headed by an inflectional feature valued for tense of the form [INFL:past].[8] Through Reverse Agree with the valued feature on T°, the unvalued feature on the modal is valued as past tense: [INFL:past], and is spelt out as *could*. This can be summarised in the tree below. Note that the dotted lines indicate the relevant agreement operation, not movement:

[7] The majority of the Reverse Agree approaches to the auxiliary inflectional system remain agnostic as to whether VoiceP functions as vP, as per Kratzer (1996), or whether a separate vP projection should be posited.

[8] T° would also bear phi-features for the purposes of agreement with the subject, but we leave this point aside for the sake of simplicity.

(14)



Essentially, the Reverse Agree approaches to the auxiliary inflectional system give the illusion of affix lowering but without recourse to actual downward head movement as per Chomsky's (1957) Affix Hopping account. For this reason, I will use the term 'affix lowering' to refer to the Reverse Agree models of auxiliary inflection, even though no downward head movement has taken place.

One of the crucial advantages that the Reverse Agree models have over Affix Hopping is that they do not give rise to ECP violations, since, as previously stated, there is no actual downward head movement. A remaining issue for these affix lowering accounts, however, concerns the fact that when finite, auxiliaries must raise to occupy T° (Emonds 1978; Pollock 1989). If all auxiliaries receive inflections in their base positions, as the affix lowering accounts claim, then how do the finite forms surface in T°? Advocates of the Reverse Agree approach posit that after undergoing agreement with T°, head movement of the finite auxiliary to T° may then occur. The major problem though is that this raising of the finite auxiliary is unmotivated, since the unvalued feature of the auxiliary has already been valued by T°'s finite inflectional feature through Reverse Agree. The authors therefore postulate that some kind of verbal equivalent of an EPP feature is present on T° which must be checked by the finite auxiliary, thereby forcing finite auxiliaries to raise, but this remains a stipulation. This proposal also runs into problems when one considers the finite lexical verb, in which case this inherent property of T° to be filled by the finite element seems to disappear.

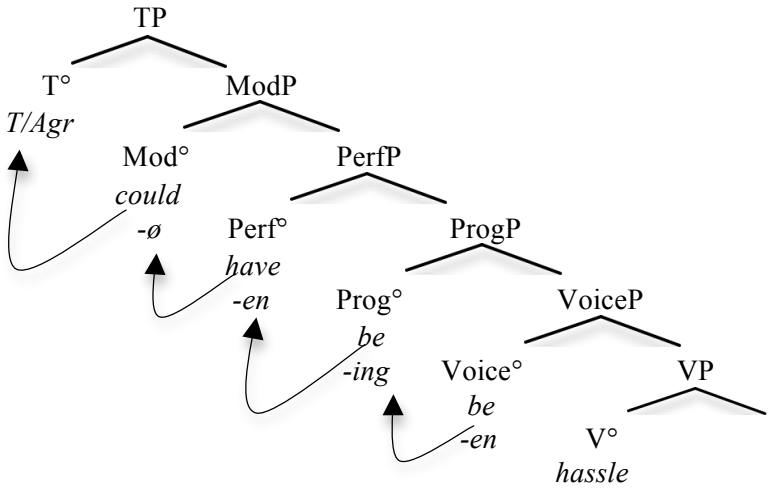
Note of course that in this system similar movement of non-finite auxiliaries to higher aspectual heads is unavailable since the aspectual heads are already filled by higher auxiliaries, therefore there is no position available for the non-finite auxiliaries to raise to. If a non-finite auxiliary were to raise into the aspectual head with which it agrees, a violation of the locality condition/Head Movement Constraint (HMC) (Travis 1984; Chomsky 1986; Baker 1988; Rizzi 1990) would ensue because it would be moving into a head that is already filled. Since T° is empty, however, it remains a viable position for the finite auxiliary to raise into.

In the following sub-section, I discuss an alternative to the affix lowering analysis that has been presented in the literature.

3.2 Auxiliary raising

An alternative to the affix lowering hypothesis was proposed by Emonds (1978) and Pollock (1989): auxiliary raising. Under this system, auxiliaries raise from their base positions to higher inflectional heads to host the stranded inflections that are present there.[9] This implies the reverse of Chomsky's original hypothesis, namely that verbal inflections in fact remain in their merge positions, and that the auxiliaries surface one position higher than the heads in which they were initially merged:

(15)



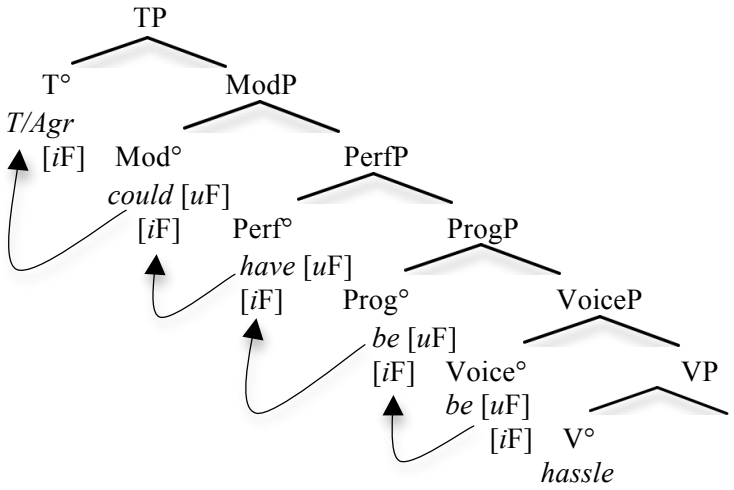
The first conceptual problem that this approach faces, however, is that, if Roberts (2010) is correct in claiming that head movement is part of narrow syntax, the type of movement depicted in (15) sits at odds with current minimalist assumptions. That is, movement in the narrow syntax is generally motivated by feature checking requirements, whereas the movement depicted above is motivated by a purely morphological requirement for stranded affixes to have a host. If the sort of movement depicted in (15) takes place within the narrow syntax, as Roberts (2010) claims, then it remains a mystery why such movement should not be featurally rather than morphologically motivated.

A more recent instantiation of the auxiliary raising account solves this issue. Chomsky (1993) and Lasnik (1995) claim that auxiliaries in English check inflectional features with higher functional heads and raise in order to do so. Specifically, these authors propose that all auxiliaries in English enter the derivation bearing uninterpretable inflectional features, whilst inflectional heads in TP or aspectual phrases bear interpretable inflectional features. The uninterpretable inflectional feature on the auxiliary causes the auxiliary to raise to the relevant T or aspectual head bearing the corresponding interpretable feature in order to have this feature checked.[10] This is illustrated in the diagram in (16). For the time being I will not enter into the precise specifications of these features for the sake of simplicity. In section 5 however, when I present my own approach to the auxiliary inflectional system, I will outline exactly what I take the feautural composition of each auxiliary and inflectional head to be.

[9] The above mentioned authors mainly deal with finite auxiliaries, but their analyses can be extended to non-finite auxiliaries as well.

[10] The featural configuration argued for in Chomsky (1993) and Lasnik (1995) is rather outdated in light of the Standard Agree model posited in Chomsky (2000, 2001), a point to which I return in section 5.

(16)



Note that the diagrams in (15) and (16) currently run foul of the HMC/locality condition, since auxiliaries raise into heads that are already occupied. These diagrams, however, are employed here only to highlight the general mechanism taking place. Section 5, where I present my own approach to the auxiliary inflectional system, refines this derivation so as to eliminate such locality issues.

The advantage of the auxiliary raising approach over the affix lowering account is that it is able to treat all auxiliaries uniformly, whether finite or non-finite. That is, raising for reasons of inflection under this approach is an inherent property of all auxiliaries in English. Under the affix lowering model, only finite auxiliaries are able to raise. Therefore, the raising of finite-auxiliaries into T° has to be put down to an inherent property of T° itself, and not of the auxiliary.

A notable disadvantage for the auxiliary raising approach, however, is that it is unclear how the lexical verb should be treated under this model. The lexical verb in English is generally taken to remain in its base position (or only undergo very short head movement to v°) (Baker 1988; Pollock 1989), despite the fact that it can be fully inflected. This fact is difficult to capture if verbs are taken to raise for inflectional purposes. The auxiliary raising approaches do have a number of potential solutions to account for the position of the lexical verb, which will be briefly discussed in section 6, but they always require additional machinery. The affix lowering models however do not run into this issue, since the lexical verb is treated uniformly with non-finite auxiliaries: the lexical verb and non-finite auxiliaries remain in their base positions and undergo Reverse Agree with higher T or aspectual heads.

To summarise, the (theoretical) advantages and disadvantages facing the affix lowering and auxiliary raising accounts are the following:

(17) Affix lowering:

a. Advantages:

Treats lexical verbs and non-finite auxiliaries uniformly.

b. Disadvantages:

Must posit additional head movement for finite auxiliaries and explain why such head movement is unavailable for finite-lexical verbs.

(18) Auxiliary raising:
  a. Advantages:
    Treats auxiliary verbs uniformly.
  b. Disadvantages:
    Must posit additional machinery for non-raising of lexical verbs.

Ultimately, these two approaches offer opposing answers to the research question that this paper aims to answer: what happens with non-finite auxiliaries? Do they raise to receive aspectual inflections akin to their finite forms, or do they remain in their base positions and have these inflections somehow lowered onto them, similar to the lexical verb? Auxiliary raising answers in favour of the former, whilst affix lowering answers in favour of the latter. It seems, however, that whichever approach one takes, additional stipulations are required. In the case of affix lowering, one must posit extra machinery to account for the raising of the finite auxiliary to T°, and in the case of auxiliary raising, one must posit extra machinery to account for the non-raising of the lexical verb.

Therefore, at this point neither model appears to emerge as theoretically superior to the other. In which case, we turn in the next section to the empirical domain in order to tease apart which approach is better suited for modelling the English auxiliary inflectional system.

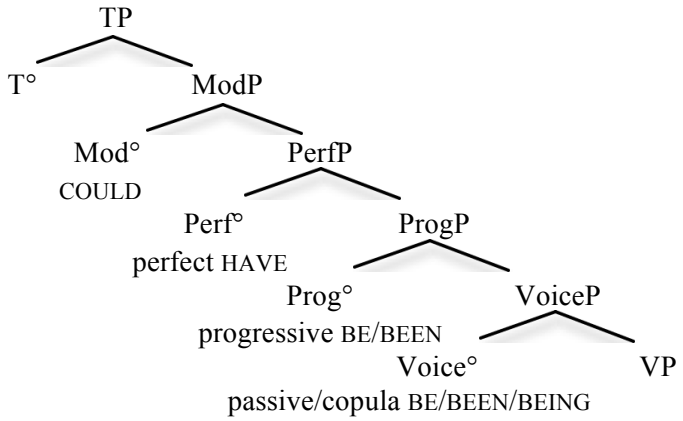
4. The empirical domain

In this section I show that, for the purposes of the English auxiliary inflectional system at least, the affix lowering accounts are inadequate when it comes to capturing all the empirical data, whilst the auxiliary raising accounts are more suited to explain the facts.

The affix lowering and auxiliary raising approaches make drastically opposing predictions with respect to the distribution of auxiliaries in English. Under the affix lowering approach, non-finite auxiliaries do not raise: rather, they receive inflections from higher aspectual projections through Reverse Agree. This means that non-finite auxiliaries are predicted to surface in their base positions, irrespective of the inflectional form they take. Therefore, auxiliary distribution is expected to be determined by auxiliary type, i.e., whether the auxiliary is a passive, copular, progressive etc., and not by the inflectional form it takes. This is illustrated by the surface positions of the auxiliaries in the following tree diagram, which depicts the structure of the middle field after Reverse Agree has taken place:[11]

[11] Apart from the modal auxiliary, I put aside the distribution of finite auxiliaries in this diagram since they are immaterial for the point being made. Ultimately all finite auxiliaries would surface in T°.

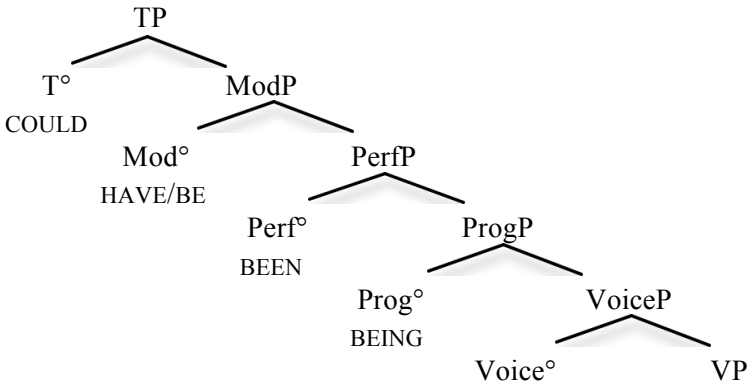
(19)



In other words, the modal is predicted to surface in Mod° (prior to head movement to T° because it is finite), the non-finite perfect auxiliary *have* is predicted to surface in Perf°, the progressive auxiliary, whether realised as *be* or *been*, is predicted to surface in Prog°, and the passive or copular auxiliary, whether realised as *be*, *been* or *being*, is always predicted to surface in Voice°.

Under the auxiliary raising approach on the other hand, according to which auxiliaries raise to discreet positions for inflectional purposes, the opposite distribution is predicted. That is, auxiliary distribution should be determined by morphological form, and not by auxiliary type. This is illustrated by the surface positions of the auxiliaries in the following tree diagram, which depicts the structure of the middle field after auxiliary raising has taken place:[12]

(20)



In other words, the modal auxiliary raises to T°, whilst Mod° is potentially filled either by the infinitival form of the perfect auxiliary *have*, or the infinitival form of *be*, whether progressive, passive or copular in origin. All instance of *been*, irrespective of whether it is progressive, passive or copular in origin, raise to Perf°, and all instances of *being*, whether passive or copular in origin, raise to Prog°.

As will be demonstrated in the following sub-sections, the predictions made by the affix lowering approach are not borne out empirically. A range of data concerning the distribution of auxiliaries in English suggests that auxiliary type generally plays no role in determining auxiliary distribution, and instead that auxiliary distribution is wholly determined by the morphological form of the auxiliary, as

[12] Aside from the modal auxiliary, I once again put aside the distribution of finite auxiliaries in this instance since they are immaterial for the point being made.

predicted by the auxiliary raising approach. This is demonstrated in sections 4.1 to 4.7 using evidence from VP ellipsis, tag-questions, VP fronting, pseudo-clefts, predicate inversion, existential constructions and floating quantifiers, respectively. Section 4.8 takes stock of this data.

4.1 VP ellipsis

Akmajian & Wasow (1975), Sag (1976) and Akmajian, Steele & Wasow (1979) have observed that the English passive auxiliary is obligatorily elided under VP ellipsis (VPE) when inflected for progressive morphology, i.e., *being*, but may escape ellipsis when inflected for perfect or infinitival morphology, i.e., *been/be*:[13,14]

(21) a. Cinderella was being made to eat Spinach, but Popeye wasn't.
b. * Cinderella was being made to eat Spinach, but Popeye wasn't **being**.
c. Cinderella will be made to eat Spinach, but Popeye won't **be**.
d. Cinderella has been made to eat Spinach, but Popeye hasn't **been**.

Similarly, the copular auxiliary is obligatorily elided when realised as *being*, but may escape ellipsis when realised as *be* or *been*:

(22) a. Popeye was being obnoxious, and Olive was, too.
b. * Popeye was being obnoxious, and Olive was **being**, too.
c. Popeye can be rather obnoxious, and Olive can **be**, too.
d. Popeye has been rather obnoxious, and Olive has **been**, too.

Since inflections always appear on the following auxiliary, the progressive auxiliary itself does not surface in the progressive form *being*. However, when realised as *be* or *been*, this auxiliary patterns with the passive and copular auxiliaries of the same morphological form by surviving VPE:

(23) a. Cinderella will be dying to meet you, and Popeye will **be**, too.
b. Cinderella has been dying to meet you, and Popeye has **been**, too.

The data appears to demonstrate therefore that the application of VPE is sensitive not to the specific type of auxiliary (passive, copular or progressive), but rather to the inflectional form it takes: all occurrences of *being*, whether passive or copular in origin, pattern one way, whilst all occurrences of *be* and *been*, whether progressive, passive or copular in origin, pattern in another.

As the following six sub-sections illustrate, the same pattern emerges in a number of other contexts: systematically it is not the type/function of auxiliary that is relevant for a particular operation, but its morphological form.

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[13] This is with the proviso that the relevant auxiliaries have an identical antecedent. As Quirk et al (1972), Sag (1976), Warner (1986) and Lasnik (1995) have all noted, ellipsis of auxiliaries is impossible if they do not have an identical antecedent:

(i) A: What are you doing? John isn't usually punished!
B: Well he is *(**being**) today. He deserves it.
(ii) Cinderella was made to eat Spinach because Popeye had *(**been**).
(iii) Cinderella was made to eat Spinach, and now Popeye will *(**be**).

[14] Whilst *being* is obligatorily elided, *be* and *been*, whether progressive, passive or copular in origin, have the curious property of being optionally elided. See Akmajian, Steele & Wasow (1979), Thoms (2011, 2012), Aelbrecht & Harwood (2012), Sailor (2012) and Bošković (to appear), all of who posit some form of auxiliary raising, for various explanations of this phenomenon.

4.2 Tag-questions

Akmajian & Wasow (1975), Bošković (2004) and Sailor (2009) have noted that American English tag-questions show a distinction parallel to the one observed in VPE: *being*, whether passive or copular in origin, is obligatorily elided, whilst *be* and *been*, whether progressive, passive or copular in origin, can escape ellipsis:[15,16]

(24) a. Cinderella was being made to eat spinach, wasn't she?
b. * Cinderella was being made to eat spinach, wasn't she **being**?
c. Cinderella will be made to eat spinach, won't she **be**?
d. Cinderella has been made to eat spinach, hasn't she **been**?

(25) a. Popeye was being obnoxious, wasn't he?
b. * Popeye was being obnoxious, wasn't he **being**?
c. Popeye can be really obnoxious at times, can't he **be**?
d. Popeye has been really obnoxious, hasn't he **been**?

(26) a. Cinderella will be eating spinach in tomorrow's spinach-eating competition, won't she **be**?
b. Cinderella has been eating spinach, hasn't she **been**?

4.3 VP fronting

Akmajian & Wasow (1975), Zagona (1982) and Johnson (2001) have all noted that *being*, whether passive or copular, is obligatorily fronted under VP fronting (VPF). Conversely, Akmajian & Wasow (1975), Akmajian, Steele & Wasow (1979) and Roberts (1998) observe that *be* and *been* can never be fronted, irrespective of whether they are progressive, passive or copular in origin:

(27) If Sebastian says he was being cooked alive, then...
a. [**being** cooked alive]$_i$ he was t_i.
b. * [cooked alive]$_i$ he was **being** t_i.

(28) If Sebastian says he is going to be cooked alive, then...
a. [cooked alive]$_i$ he will **be** t_i.
b. * [**be** cooked alive] $_i$ he will t_i.

(29) They said Sebastian was to be cooked alive, and so...
a. [cooked alive]$_i$ he has **been** t_i.
b. * [**been** cooked alive]$_i$ he has t_i.

(30) If Jasmine says that Aladdin was being obnoxious, then...
a. [**being** obnoxious]$_i$ he was t_i.
b. * [obnoxious]$_i$ he was **being** t_i.

(31) I told the children to be very good, and...
a. [very good]$_i$ they have **been** t_i.
b. * [**been** very good]$_i$ they have t_i.

[15] British English behaves rather differently in that all but the finite auxiliary is obligatorily elided.
[16] Once again, *be* and *been*, whether progressive, passive or copular, have the curious property of being optionally elided.

(Examples from Roberts (1998:117).)

(32) John said he was going to be obnoxious, and...
a. [obnoxious]$_i$ he will **be** t_i.
b. * [**be** obnoxious]$_i$ he will t_i.

(Examples from Roberts (1998:117).)

(33) They swore that John had been taking heroine, and...
a. * [**been** taking heroine]$_i$ he had t_i.
b. [taking heroine]$_i$ he had **been** t_i.

(Examples from Akmajian, Steele & Wasow (1979:23).)

(34) If Scrooge McDuck says he'll be working late, then...
a. [working late]$_i$ he will **be** t_i.
b. * [**be** working late]$_i$ he will t_i.

4.4 Pseudo-clefts

A parallel case to VPF is that of specificational pseudo-clefting, which has been argued to involve fronting by Blom & Daalder (1977), Declerck (1988), Den Dikken (1995), Heggie (1988), Heycock (1994), Higgins (1979), Moro (1997) and Verheugd (1990) (cited in Den Dikken 2006)). Sailor (2012) observes that such instances of fronting also seem to target the same material as VPF. Relevantly for the present discussion, *being*, whether passive or copular in origin, must be fronted with the lexical verb when pseudo-clefting occurs, whilst *be* and *been*, whether passive or copular, cannot be:[17]

(35) Aladdin should be being criticised.
a. No, [**being** praised]$_i$ is what Aladdin should be t_i.
b. * No, [praised]$_i$ is what Aladdin should be **being** t_i.

(36) Aladdin should have been praised.
a. No, [criticised]$_i$ is what Aladdin should have **been** t_i.
b. * No, [**been** criticised]$_i$ is what Aladdin should have t_i.

(37) Aladdin should be praised.
a. No, [criticised]$_i$ is what Aladdin should **be** t_i.
b. * No, [**be** criticised]$_i$ is what Aladdin should t_i.

(38) Aladdin should be being more helpful.
a. No, [**being** less helpful]$_i$ is what Aladdin should be t_i.
b. * No, [less helpful]$_i$ is what Aladdin should be **being** t_i.

(39) Aladdin should have been more helpful.
a. No, [less helpful]$_i$ is what Aladdin should have **been** t_i.
b. * No, [**been** less helpful]$_i$ is what Aladdin should have t_i.

[17] Progressive lexical verbs seem not to be compatible with such pseudo-clefting constructions without use of some kind of British English *do*, making it less clear as to whether fronting is involved in such instances:
(i) Popeye should be sleeping. No, [fighting] is what Popeye should be *(**doing**).

(40) Aladdin should be more helpful.
  a. No, [less helpful]$_i$ is what Aladdin should **be** t_i.
  b. * No, [**be** less helpful]$_i$ is what Aladdin should t_i.

4.5 Predicate inversion

Hooper & Thompson (1973), Emonds (1976), Heycock & Kroch (1999) and Haegeman (2008) have analysed predicate inversion contexts as involving fronting of the predicate. In such cases, *being*, whether passive or copular, is obligatorily fronted, whilst *be* and *been* cannot be, irrespective of whether they are progressive, passive or copular in origin:

(41) a. [Also **being** examined for body parts] is the tonnes of rubble being removed from the site.
(*Guardian*, 14.9.1, p4, col 6., from Haegeman (2008))
  b. * [Also examined for body parts] is **being** the tonnes of rubble being removed from the site.
  c. [Also examined for body parts] has **been** the tonnes of rubble being removed from the site.
  d. * [Also **been** examined for body parts] has the tonnes of rubble being removed from the site.
  e. [Also examined for body parts] will **be** the tonnes of rubble being removed from the site.
  f. * [Also **be** examined for body parts] will the tonnes of rubble being removed from the site.

(42) a. [Also **being** loud and obnoxious today] is my old friend Bugs Bunny.
  b. * [Also loud and obnoxious today] is **being** my old friend Bugs Bunny.
  c. [Also with us in the studio today] will **be** my old friend Bugs Bunny.
  d. * [Also **be** with us in the studio today] will my old friend Bugs Bunny.
  e. [Also with us in the studio today] has **been** my old friend Bugs Bunny.
  f. * [Also **been** with us in the studio today] has my old friend Bugs Bunny.

(43) a. [Also appearing on today's show] will **be** our local congressman.
  b. * [Also **be** appearing on today's show] will our local congressman.
  c. [Also appearing on today's show] has **been** our local congressman.
  d. * [Also **been** appearing on today's show] has our local congressman.

4.6 Existential constructions

Harwood (2011, 2012a,b, to appear) has noted that in existential constructions, *being* must follow the associate, whether passive or copular in origin, whilst *be* and *been* must precede it, irrespective of whether they are progressive, passive or copular:

(44) a. There were many smurfs **being** arrested for anti-social behaviour.
  b. * There were **being** many smurfs arrested for anti-social behaviour.
  c. There will **be** many smurfs arrested for anti-social behaviour.
  d. * There will many smurfs **be** arrested for anti-social behaviour.
  e. There have **been** many smurfs arrested for anti-social behaviour.
  f. * There have many smurfs **been** arrested for anti-social behaviour.

(45) a. There was a gang of smurfs **being** rather loud and obnoxious.

b. * There was **being** a gang of smurfs rather loud and obnoxious.
c. There will **be** a gang of smurfs in the garden tonight.
d. * There will a gang of smurfs **be** in the garden tonight.
e. There has **been** a lot of commotion in the street today.
f. * There has a lot of commotion **been** in the street today.

(46) a. There will **be** a gang smurfs dancing in the garden tonight.
b. * There will a gang of smurfs **be** dancing in the garden tonight.
c. There has **been** a gang of smurfs dancing in our garden all night.
d. * There has a gang of smurfs **been** dancing in our garden all night.

4.7 Floating Quantifiers

Bošković (2004), Haegeman (2008), Cirillo (2009) and Harwood (2012) have all observed that *being* must follow a floating quantifier whilst *be* and *been* can precede it, and that this is irrespective of whether the auxiliary is progressive, passive or copular in origin:[18]

(47) a. The students are all **being** arrested by the police.
b. * The students are **being** all arrested by the police.
c. The students have **been** all arrested by the police.
d. The students will **be** all arrested by the police.
(Examples (47)b and c from Bošković to appear:25)

(48) a. They are all **being** noisy
b. * They are **being** all noisy.
c. They have **been** all rather noisy.
d. They can **be** all rather noisy.
(Examples (48)a and b from Bošković (2004:686))

(49) a. The students could **be** all failing the exam.
b. The students have **been** all running in the marathon.
(Example (49)a from Bošković (2004:694))

Note that Bjorkman (2011:79) also invokes the distribution of floating quantifiers to argue for the claim that non-finite auxiliaries do not raise. She claims that floating quantifiers cannot follow any instance of a passive auxiliary, but can easily follow progressive auxiliaries. As the data above (specifically (47)c and d) illustrates, this is not the case.

4.8 Taking stock

To summarise the data, all occurrences of *being*, irrespective of whether it instantiates the passive auxiliary or the copular, pattern together, whilst all occurrences of *be* and *been*, irrespective of whether they instantiate the progressive, passive or copular auxiliary, pattern together. More specifically, all occurrences of *being* are obligatorily elided under ellipsis phenomena, obligatorily fronted under fronting phenomena and must follow associates and FQs. All occurrences of *be* and *been*, on the other hand, can escape ellipsis phenomena, are obligatorily stranded by fronting phenomena, can

[18] There is apparently a degree of dialectal variation concerning the ability of *all* to float after *be* and *been* (Bošković to appear), though this is generalised across all instances of *be/been* and is not specific to one auxiliary type.

precede FQs and must precede associates. These properties are summarised in the table below:

(50)

Empirical Phenomenon	***Be/Been***	***Being***
VPE	Stranded	Elided
Tag-Questions	Stranded	Elided
VPF	Stranded	Fronted
Pseudo-Clefting	Stranded	Fronted
Predicate Inversion	Stranded	Fronted
Existentials	Precedes associate	Follows associate
FQs	Precedes FQ	Follows FQ

If auxiliaries were inflected in their base positions as the affix lowering models claim, we would expect that the type/function of the auxiliary would determine its patterning: the progressive auxiliary would be predicted to behave differently from the passive and the copular. The behaviour of each auxiliary would not be expected to depend on the morphological form it takes. If auxiliaries raised for inflectional purposes, on the other hand, as in the auxiliary raising accounts, we expect the morphological form that the auxiliary takes to determine its patterning: all instances of *be*, irrespective of whether it is a progressive, passive or copular auxiliary in origin, would pattern differently from all instances of *been*. Similarly, all instances of *been* would pattern differently from all instances of *being*.

The data quite clearly demonstrates that *being* behaves apart from *be* and *been*, irrespective of the type/function of the auxiliaries, i.e., irrespective of whether they are merged as the head of Prog° or Voice°. This suggests that it is actually the morphological form of the auxiliary that determines its distribution. These facts conform with the predictions of the auxiliary raising models, and contradict those of the affix lowering models.[19]

The only evidence presented in support of the affix lowering/Reverse Agree analysis, is that offered in Bjorkman (2011:79):

(51) a. The cake has (fortunately) been (*fortunately) eaten.
b. The cake will (fortunately) be (*fortunately) eaten.
c. The cake seemed to (fortunately) be (*fortunately) eaten.

(52) a. The children have (fortunately) been (?fortunately) eating the cake.
b. The children will (fortunately) be (?fortunately) eating the cake.
c. The children seemed to (fortunately) be (?fortunately) eating the cake.

(51) shows that the adverb *fortunately* cannot follow the passive auxiliary, irrespective of the inflectional form it takes, whereas (52) demonstrates that such an adverb can potentially follow the progressive auxiliary, irrespective of its inflectional form. Bjorkman (2011) uses these judgements to claim that progressive auxiliaries always surface in a higher position than passive auxiliaries. That is, progressive auxiliaries surface in Prog°, whilst passive auxiliaries surface in Voice°. Assuming that the adverb *fortunately* is adjoined to VoiceP, this explains the distribution shown

[19] Note that no distributional distinction between *be* and *been* is observed in the data. A distinction only appears to exist between *be/been* on the one hand, and *being* on the other. This is an interesting fact that requires further investigation.

in (51) and (52). This data suggests therefore that auxiliary distribution is determined by auxiliary type and not by inflectional form, counter to the preceding arguments. However, it is worth noting that when the adverb *fortunately* follows the progressive auxiliary, the result is still degraded, as Bjorkman notes. This makes the contrast between the passive auxiliary and the progressive auxiliary less clear-cut, and likely open to a degree of speaker variation. A number of informants (the present author included) for instance, do not share the judgments given in Bjorkman (2011): these speakers reject all instances of *fortunately* following *be* or *been*, whether progressive or passive. Therefore the evidence in (51) and (52) cannot be said to be a conclusive argument in favour of the affix lowering approaches.

For this reason I reject Bjorkman's (2011) claim that auxiliary distribution is determined by auxiliary type, and instead believe that the *be/been* vs. *being* distinction detailed in sections 4.1 to 4.7 provides much stronger evidence that auxiliary distribution is actually determined by morphological form. This poses a significant challenge to the affix lowering analyses and suggests that the distribution of English auxiliaries is better captured under an auxiliary raising analysis.

However, if the auxiliary raising analysis is to be adopted for the English auxiliary inflectional system, and not only for the behaviour of finite auxiliaries but for non-finite auxiliaries as well, then a few refinements must be made to the system that Chomsky (1993) and Lasnik (1995) propose. In the following section, I outline the problems with the current auxiliary raising analysis that motivate the need for further adjustments, before presenting a more up-to-date version of this approach.

5. Auxiliary raising revisited

In this section I revisit the auxiliary raising analysis. In section 5.1 I show that the current system of auxiliary raising, as proposed by Chomsky (1993) and Lasnik (1995), requires further refinement in order to conform with more modern minimalist assumptions. Section 5.2 provides a more up-to-date version of auxiliary raising that utilizes foot-driven movement in order to solve the issues that arose in section 5.1. Finally, section 5.3 addresses any further potential problems that may arise from the analysis itself.

5.1 Problems for the current auxiliary raising analysis

Recall first of all that the auxiliary raising analysis presented in (16) ran foul of the HMC/locality condition. A second issue, which I have so far failed to mention, is the fact that Chomsky's and Lasnik's approach to the auxiliary inflectional system was made redundant with the introduction of Standard Agree (Chomsky 2000, 2001). As previously mentioned, the standard formulation of this mechanism requires the c-commanding element (the Probe) to bear an unchecked or unvalued feature which is licensed by a fully specified feature (the Goal) within its c-command domain:

(53) Standard Agree (Chomsky 2000, 2001):[20]

PROBE	>	GOAL
[*u*F]		[*i*F]

[20] The version of Standard Agree presented in (10) was stated in terms of valued and unvalued features. It can be equally stated however in terms of interpretable and uninterpretable features, as will be seen in (56). In (53) and (54) I appeal to (un)interpretable features rather than (un)valued features so as to maintain coherency between Standard Agree, which introduced feature valuation, and Chomsky's (1993) and Lasnik's (1995) proposals, which were made prior to the introduction of feature valuation.

Movement then operates off the back of this relation with the requirement that an EPP feature on the Probe be checked locally by the Goal. The Probe-Goal relationship of Standard Agree, however, is featurally the opposite of what Chomsky (1993) and Lasnik (1995) propose, in which the c-commanding elements (T° or Aspect°) bear fully interpretable features, and the structurally lower c-commanded elements (the auxiliaries) bear uninterpretable features:

(54) Chomsky (1993), Lasnik (1995):

PROBE (T°, Aspect°)	>	GOAL (auxiliaries)
[*i*F]		[*u*F]

This is at odds with the current understanding of movement in narrow syntax. If anything, it appears more like the conditions required for Reverse Agree. In any case, whether one assumes Standard Agree, as per Chomsky (2000, 2001), or Reverse Agree, as per Adger (2003), Bjorkman (2011) and Wurmbrand (to appear), there is no particularly easy means, under the above mentioned authors' assumptions, by which movement of the auxiliary could actually take place under the configuration in (54).

These issues will be addressed in the following section where I present an updated approach to the auxiliary raising analysis.

5.2 Auxiliary raising through foot-driven movement.

The intention here is to offer an auxiliary raising approach to the English auxiliary inflectional system which operates through feature checking, of the sort proposed by Chomsky (1993) and Lasnik (1995), but one which largely conforms with more recent minimalist guidelines.

I assume the featural configuration posited in (54) to be essentially correct, with the tense and aspectual heads to be fully featurally specified, whilst all auxiliaries are featurally deficient. I also assume the standard model of Agree as proposed by Chomsky (2000, 2001) and not that of Reverse Agree (Aelbrecht 2010; Baker 2008; Haegeman & Lohndal 2010; Merchant 2011; Wurmbrand 2011; Zeijlstra 2008, 2010).[21] The question therefore is, how are auxiliaries able to raise to have their inflectional features checked or valued under these assumptions? To answer this question I adopt a version of Bošković's (2007) theory of foot-driven movement.

Bošković's theory crucially allows one to perform movement operations that are motivated by uninterpretable features being located on the moving element itself, but whilst also maintaining the Probe-Goal agreement relation under the original formulation of Agree. His proposal is to some extent an update of the earlier Minimalist versions of Agree-driven movement (Chomsky 1993, 1995). Bošković's proposal works as follows: an item X is merged into the derivation bearing an uninterpretable feature which must be checked in order to prevent the derivation from crashing. This motivates X to probe downwards into its c-command domain to find a relevant item Y bearing a matching interpretable feature which can check the feature on X through Agree. Suppose, however, that no such element Y sits in the c-command domain of X. The derivation is now in danger of crashing since X cannot have its feature checked. If we assume Reverse Agree to not be a valid operation for X, as Bošković does, then there is but one option available to X to prevent the derivation from crashing: Move. That is, upon construction of the following phrase,

[21] I do not necessarily entirely reject the notion of Reverse Agree. I claim merely that it does not operate on the auxiliary inflectional system of English.

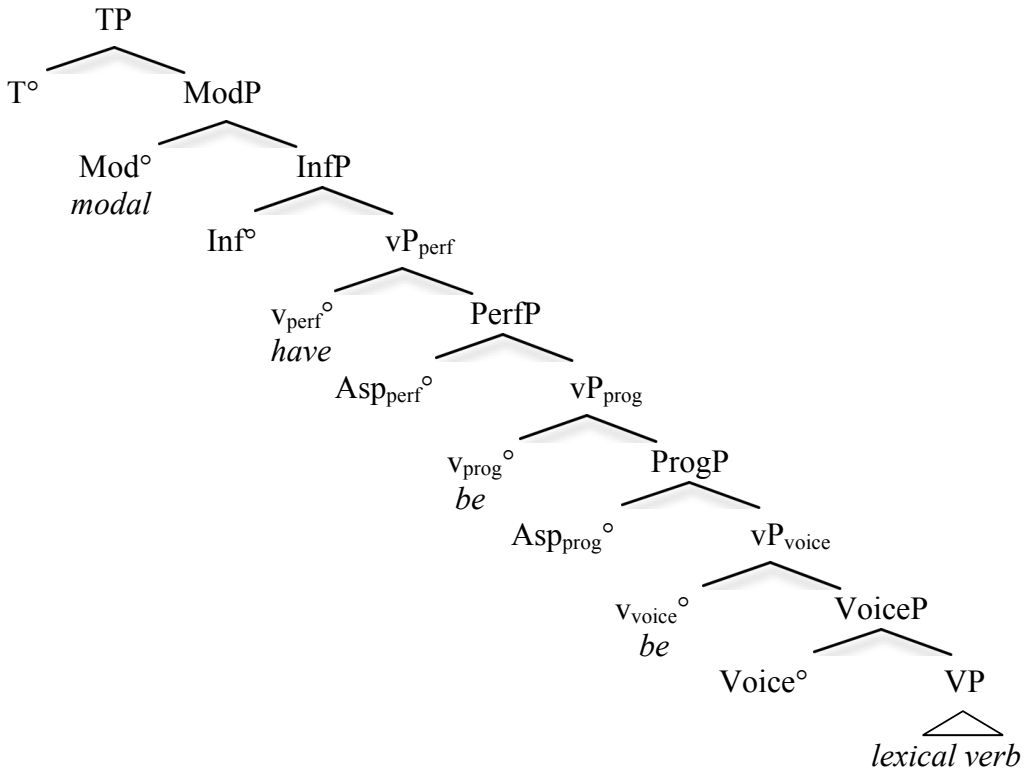
and having found no relevant target for Agree, X moves up to the next available position and once again probes into its c-command domain, which now is a little larger than last time (one entire phrase larger to be precise). If X still fails to find a relevant target for Agree, then it continues to raise and probe with the construction of each successive phrase, until the relevant item Y finally sits within its c-command domain. Y then checks X's feature through Agree, and now, with its feature satisfied, X has no need to raise any further and so is spelt out in this position.

In this sense, movement is not dependent upon the moving element being probed by a higher item. That is, movement is always driven by the moving element's need to check its own feature. This approach to movement provides us with three advantages: first, successive cyclic movement comes for free as the moving element always raises into the next immediately available position before probing once again into its c-command domain. Second, it removes the look-ahead problem that arose with movement of items to the phase edge in order to enter into Agree operations with items in the higher phase, as the moving element no longer needs to wait for construction of a certain element in a higher phase before it begins moving. And finally, such an approach can potentially do away with stipulating an EPP feature for all movement operations (see Bošković 2007 for the precise details).

This approach to movement can be applied to the English auxiliary inflectional system. Before we begin with a full implementation however, two alterations must be made to the system we have been assuming. I will introduce these alterations without discussion, returning to them in section 5.3 to justify the need for these changes.

The first change comes about when we take into account that English auxiliaries belong to the category of verbs and share most morphological properties with verbs. In order to capture this point I posit a vP shell on top of each aspectual projection. It is in the head of these vP shells that the relevant auxiliaries are first merged rather than in the heads of the aspectual projections. The heads of the actual aspectual projections themselves host the aspectual inflectional features, and provide an available landing site for (lower) auxiliaries to raise into. This provides us with the following hierarchical structure, with the italicised auxiliaries representing the positions of first merge:

(55)



To be precise, modals are merged in Mod°, whilst the infinitival inflectional features that are introduced by modals are situated directly below this in a projection labelled Inf°. The perfect auxiliary *have* is merged below this position in the vP shell v_{perf}°, and the perfect inflectional feature it selects is the head of its complement PerfP. The progressive auxiliary is merged in v_{prog}°, and the progressive inflectional feature introduced by the auxiliary is situated directly below this in Prog°. The passive auxiliary is then merged in v_{voice}°, and the passive inflectional feature it selects heads its complement VoiceP.

The second change to be made is that whilst the Reverse Agree models work on a system of auxiliaries having their inflectional features valued by higher aspectual heads, Bošković's (2007) theory forces us to deploy a system in which auxiliaries bear readily valued, but uninterpretable features that must be checked for licensing by their interpretable counterparts located on higher aspectual heads. For instance, rather than *being* simply bearing an unvalued inflectional feature [INF:__] that is valued by the progressively valued inflectional feature [INF:prog] on Prog°, I assume that *being* bears a readily valued progressive inflectional feature, but which is uninterpretable: [*u*INFL:prog]. This feature is checked against its interpretable counterpart [*i*INFL:prog] on Prog°.

Note that the version of Standard Agree given in (10) was stated solely in terms of (un)valued features, whereas in the system we are adopting, (un)interpretable features must also be factored in. Therefore we must slightly restate Standard Agree as follows:

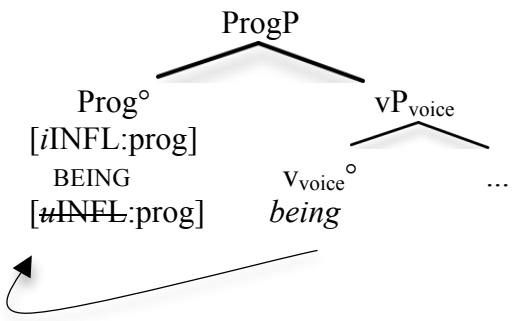
(56) *Agree – Take II*
Agree is a relationship between two features such that an uninterpretable or unvalued feature [*u*F]/[F:__] is checked or valued by a feature [*i*F]/[F:val] of the same type iff:
a. A head α containing [*u*F]/[F:__] c-commands a head β containing [*i*F]/[F:val].
b. There is no head γ containing a matching feature [*i*F]/[F:val], such that γ c-commands β and α c-commands γ.

I provide further reasoning for each of these alterations in section 5.3. Now, I show how we implement Bošković's (2007) approach to movement into the English auxiliary inflectional system.

As previously stated, I assume auxiliaries are base generated in the heads of vP shells located above the aspectual projections they select. Each auxiliary enters the derivation bearing a readily valued but uninterpretable inflectional feature which must be checked against a matching interpretable inflectional feature on a higher tense or aspectual head. In accordance with Standard Agree, however, the uninterpretable feature on the auxiliary is only able to probe downwards into its c-command domain in search of a matching feature. Failing to find such a feature, the inflectional feature on the auxiliary remains unchecked, meaning the derivation is in danger of crashing. In order to prevent a derivational crash the auxiliary raises into the next head up and probes once again into its c-command domain. It continues to raise and probe until the relevant matching interpretable inflectional feature sits within its c-command domain. This checks the auxiliary's inflectional feature, since the necessary conditions for Standard Agree have been established. Without any further motivation to move, the auxiliary is then spelt out in this position in accordance with its feature specifications.

I illustrate this mechanism with concrete examples. Consider the passive auxiliary *being*, merged in v_{voice}°. By virtue of its morphology, *being* enters the derivation bearing an uninterpretable inflectional feature valued for progressive aspect: [*u*INFL:prog], which must ultimately be licensed by an interpretable inflectional feature with a matching value: [*i*INFL:prog]. In order to check its feature, the auxiliary probes inside its c-command domain in search of the relevant matching feature. Given the hierarchy we proposed however, there is no matching target in the c-command domain. The auxiliary therefore raises to the next available position, the head of the next phrase up, and probes once again. The next phrase up is ProgP, which I assume to be merged with the matching interpretable feature: [*i*INFL:prog] in its head. With the auxiliary having raised to Prog°, Prog°'s own interpretable feature now sits within the c-command domain of the auxiliary, satisfying the conditions for Standard Agree.[22] ProgP's [*i*INFL:prog] is therefore able to check the auxiliary's uninterpretable [*u*INFL:prog] feature. The auxiliary, with its feature satisfied, has no further need to raise and so remains in Prog°, where, due to its value, it is spelt out as *being*. This is illustrated in the tree below. The italicised form represents the base position of the auxiliary, and the capitalised form represents the position in which it is spelt out.

(57)



I assume that, by virtue of its form (and by virtue of it possibly being first-merged in the same position as the passive auxiliary), copular *being* undergoes a similar process.

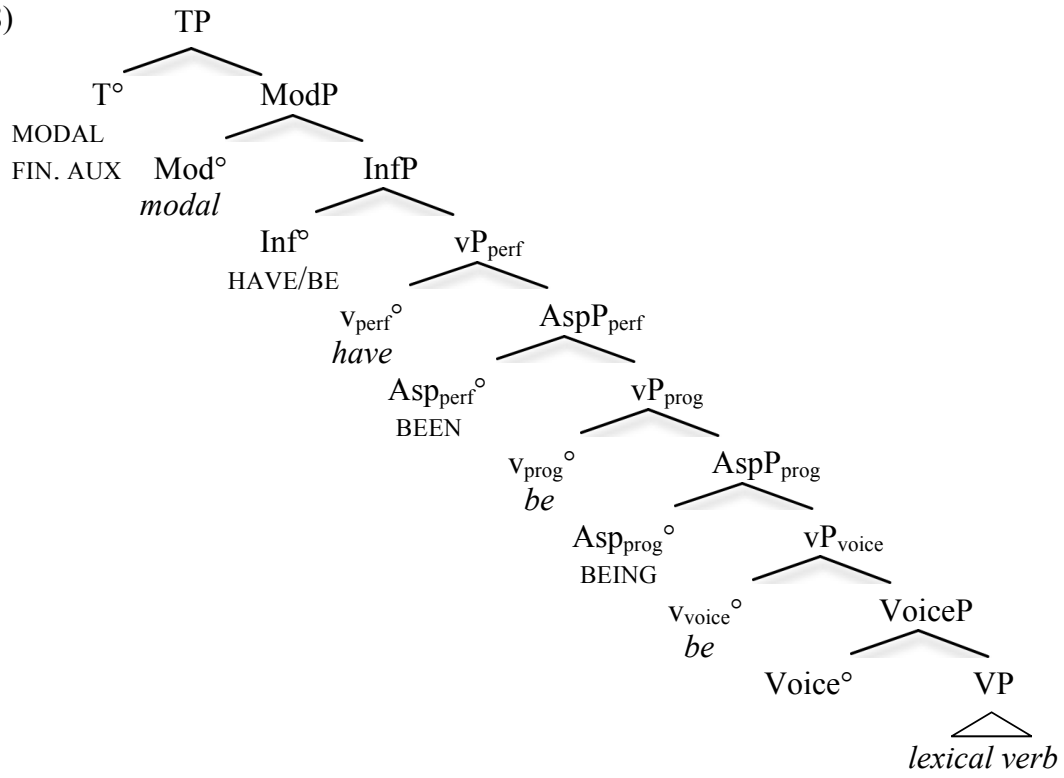
In the case of the form *been*, whether passive, progressive or copular, this auxiliary is merged bearing an uninterpretable [*u*INFL:perf] feature, which must ultimately be checked against [*i*INFL:perf] in the head of PerfP. The progressive instance of *been* is merged in the head of vP_{prog}, and the passive and copular instances are merged in the head of vP_{voice}. In all instances, this auxiliary raises to Perf°, so that PerfP's matching interpretable feature sits within the auxiliary's c-command domain, thereby checking the auxiliary's inflectional feature through Standard Agree and causing it to be spelt out in this position as *been*.

The case of non-finite *be* is similar, except that it is merged bearing an uninterpretable infinitival [*u*INFL:inf] feature which must raise and check against the matching [*i*INFL:inf] feature in Inf°. Non-finite *have*, merged in v_{perf}°, bears the same feature which must also be checked in Inf°. Finally, modals (merged in Mod°) and finite auxiliaries are merged bearing a finite [*u*INFL:fin] feature which must be checked in T° against T's own [*i*INFL:fin] feature.

[22] I assume that if the relevant matching interpretable feature occupies the same head as the auxiliary, then this is also within the auxiliary's c-command domain, and so is able to check the auxiliary's feature in this position.

To summarise, this gives the following potential distribution of auxiliaries in English (once again the italicised forms represent the base positions of the auxiliaries, and the capitalised forms are their potential spell-out positions):

(58)



As the diagram in (58) demonstrates, in the system of auxiliary raising I have elaborated, the distribution of auxiliaries is determined by their inflectional forms and not by their type. That is, *being*, *been*, *be* and *have*, and modals and finite auxiliaries, all come to occupy discreet inflectional positions in the clause. This would allow us to account more easily for the distributional differences between *be* and *been* on the one hand, and *being* on the other, as detailed in section 4. Moreover, the raising of the auxiliaries is motivated through feature checking so as to conform with other forms of movement in narrow syntax, whilst remaining consistent with the featural configuration set up under Standard Agree (Chomsky 2000, 2001). This was achieved by appealing to Bošković's (2007) notion of foot-driven movement in which movement is driven by a featural deficiency on the moving item itself.

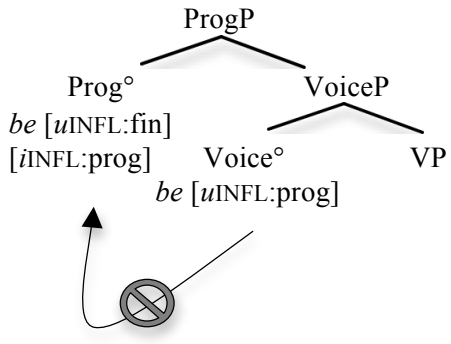
In the following section I discuss two further potential problems that my proposal gives rise to.

5.3 Potential Problems

The first assumption to be addressed is the deployment of multiple vP shells. Under the system I have proposed, auxiliaries are merged into the heads of vP shells and raise into higher aspectual projections for reasons of feature checking. An alternative position is to propose that auxiliaries are merged directly into their aspectual heads. On this assumption, however, the auxiliary would fill the only head available and there would be no empty position for a lower auxiliary to raise into. That is, each auxiliary would have to raise into and check its features in an aspectual head already occupied by another auxiliary. This would be a direct violation of the locality condition/HMC, which bans multiple syntactic items from occupying the same

position. This was the issue with the original auxiliary raising diagram in (16), a small portion of which I replicate here:

(59)



In order to ensure that the auxiliary has a space to move to, and therefore avoid locality/HMC violations, we must postulate a more articulated structure which has independent positions for auxiliaries and interpretable inflectional features. In order to achieve this, I posited a vP shell on top of every aspectual projection, in the head of which the auxiliary selecting that particular aspectual form is base generated. This leaves the head of the aspectual projection itself available for a lower auxiliary to raise into. Hence the need for vP shells and the hierarchical structure we posited in (55). The necessity of postulating vP shells is a disadvantage to the auxiliary raising analysis since the vP shells in which the auxiliaries are base generated are semantically unmotivated. Ideally such vP shells should be eliminated, though there is currently no obvious means of doing so.

The second issue to discuss is the reliance on uninterpretable features as opposed to unvalued features. This is required in order to prevent higher auxiliaries from receiving inflections from lower down in the hierarchy. Consider what would happen if an auxiliary bore unvalued features under Bošković's approach: the auxiliary would be able to probe within its c-command domain (recall that Bošković's system operates under Standard Agree) and be valued by the first feature it comes across whose value is fully specified, wrongly predicting that auxiliaries receive their inflections from the next aspectual head down rather than the next aspectual head up. By having auxiliaries with readily valued but uninterpretable features, they can only be checked by a matching aspectual feature situated higher, rather than lower, in the clausal hierarchy. For instance, suppose that a passive auxiliary enters the derivation with its uninterpretable inflectional feature readily valued for progressive morphology: [*u*INFL:prog]. The only fully specified feature the auxiliary can be checked against in this instance is the [*i*INFL:prog] feature located above it in the head of ProgP. This correctly predicts that the auxiliary will only be able to receive its inflection from a higher aspectual head rather than a lower one.

This complication to the system is less than ideal since, as Adger (2003:135) notes, feature checking forces us to generate ill-formed structures with non-matching features and then rule them out because of the presence of unchecked features, until we finally arrive at the one well-formed structure in which all features match and so no uninterpretable features exist by the end of the derivation. In this respect, a feature valuation approach poses a distinct advantage as with feature valuation we simply never generate the ill formed structures in the first place. This reduces the number of possible derivations that we need to consider when we generate a sentence. However, due to the fact that feature valuation, coupled with Standard Agree, would predict

auxiliaries to receive inflections from lower down in the hierarchy rather than higher up, we cannot adopt a pure valuation approach.

In favour of feature checking, however, Lasnik (1995) and Wurmbrand (2011, 2012a, 2012b) have shown, using evidence from VPE, that there is good reason to believe auxiliaries in English enter the derivation bearing readily valued but uninterpretable inflectional features. I briefly review this evidence here.

There is usually assumed to be a strict identity condition on ellipsis in that the constituent that is elided must be identical in form to its antecedent in order for it to be fully recoverable. Yet Quirk et al (1972), Sag (1976), Warner (1986) and Lasnik (1995) have all noted that aspectual mismatches are permitted between the antecedent of an ellipsis clause and the ellipsis clause itself, when the lexical verb is bearing the aspectual inflection: for instance in (60)a the tensed *ate* antecedes the ellipsis of infinitival *eat*, and in (60)c, the infinitival form *eat* antecedes ellipsis of the participle *eaten*.

(60) a. Ted **ate** a bunny burger, and Robin will [~~**eat** …~~] too.
b. First Ted **ate** a bunny burger, and now Robin has [~~**eaten** …~~].
c. Ted will **eat** a bunny burger because Robin has [~~**eaten** …~~].
d. Ted has **eaten** a bunny burger, and now Robin might [~~**eat** …~~].

As noted in footnote 13, on the other hand, when auxiliary verbs are elided no such aspectual mismatches are permitted. The elided auxiliary must be identical to the antecedent:

(61) a. Ted has been eaten by a gorilla and Robin might *(**be**) [~~eaten by …~~] too.
b. Ted will be eaten by a gorilla and Robin might (**be**) [~~eaten by …~~] too.
c. Ted was eaten by a gorilla and Robin has *(**been**) [~~eaten by a …~~] too.
d. Ted has been eaten by a gorilla and Robin has (**been**) [~~eaten by …~~] too.

Lasnik (1995) argues that this contrast between (60) and (61) supports his approach that auxiliaries enter the derivation readily inflected for their tense or aspectual morphology, whereas lexical verbs enter the derivation bare and only receive inflections later on. Consequently, the lexical verb in the ellipsis sites in (60) will be identical to the lexical verb in the antecedent clause at some point during the derivation, irrespective of how it is actually inflected on the surface, and so is fully recoverable. I illustrate this with the underlying form of the sentence in (60)b:

(62) First Ted T_{ense} **eat** a bunny burger, and now Robin has *–en* [~~**eat**…~~]

For auxiliaries, which enter the derivation readily inflected, this is not the case: if the elided auxiliary is inflectionally different from its antecedent, they were never identical to one another in the first place, and therefore the elided auxiliary cannot be recovered, leading to a violation of the strict identity condition. I illustrate this with the underlying form of the sentence in (61)c:

(63) * Ted **was** eaten by a gorilla and Robin has [~~**been** eaten…~~] too.

Wurmbrand (2011, 2012a, 2012b) has proposed an update of Lasnik's argument: she claims that auxiliaries, rather than being readily inflected, enter the derivation bearing readily valued, but uninterpretable inflectional features, whereas lexical verbs bear

unvalued inflectional features. If one assumes that the strict identity condition on ellipsis is only concerned with recovering the featural composition of the ellipsis site, then this again correctly explains the facts: if the elided auxiliary is inflectionally different from its antecedent, the feature values of the two auxiliaries will never match in the underlying derivation; hence the elided auxiliary cannot be recovered. I illustrate this once again with the underlying form of the sentence in (61)c:

(64) * Ted **be**[*u*INFL:**fin**] eaten by a gorilla and Robin has ~~[**be**[*u*INFL:**perf**] eaten…]~~ too.

If the elided lexical verb is inflectionally different from its antecedent, on the other hand, no such violation of strict identity occurs since the inflectional features of both lexical verbs were equally unvalued in the underlying derivation; therefore the lexical verb can always be recovered. I illustrate this again with the underlying form of the sentence in (60)b:

(65) First Ted **eat**[*u*INFL:_] a bunny burger, and now Robin has ~~[**eat**[*u*INFL:_]...]~~

This suggests, as claimed earlier, that auxiliaries do indeed enter the derivation bearing readily valued, but uninterpretable inflectional features rather than simply unvalued features. This seems to give some justification to the foot-driven movement account argued for in this paper which is dependent upon the presence of uninterpretable but readily valued inflectional features on auxiliaries.

6. Further issues

In the final section of this paper I briefly discuss two further issues that arise from the previous discussion. The first considers the behaviour of the lexical verb under the analysis I have proposed. The second issue considers exactly why *being* should behave apart from other auxiliaries.

6.1 The lexical verb

So far, this paper has almost exclusively focused on the behaviour of auxiliaries, in particular that of non-finite auxiliaries. A point I have stayed away from for the most part is the behaviour of the lexical verb. As is well known, the lexical verb doesn't raise beyond v°/V° in English (Pollock 1989), despite the fact that it can be fully inflected. The question is, how can this be captured under the analysis I have proposed? Here I offer a few speculative remarks on the issue.

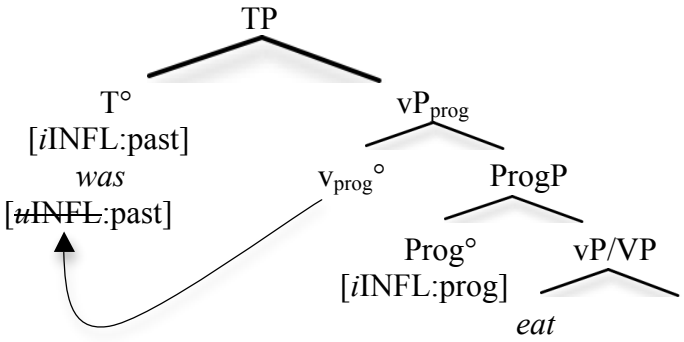
Recall that under the analysis I proposed, auxiliaries check their uninterpretable inflectional features via Standard Agree with their interpretable counterparts on higher aspectual heads. This causes auxiliaries to overtly raise until the relevant matching features sit within their c-command domain. Under this approach, there are three potential means of analysing the non-raising of the lexical verb.

First of all, the lexical verb could simply covertly raise to check its inflectional feature rather than overtly raise (Chomsky 1993). The reason for the distinction between auxiliaries and lexical verbs under this hypothesis could be attributed to auxiliaries being comprised purely of formal syntactic features, as Roberts (1998) suggests, whilst lexical verbs actually carry lexical content. Therefore, whenever an inflectional feature typically associated with an auxiliary raises, it will manifest itself as overt auxiliary raising because the auxiliary is nothing more than a phonological

realisation of the formal inflectional feature. Therefore there is no lexical content to be stranded by the feature movement. With the lexical verb however, its inflectional feature can raise, but in this instance there is actual lexical content that the feature can strand.

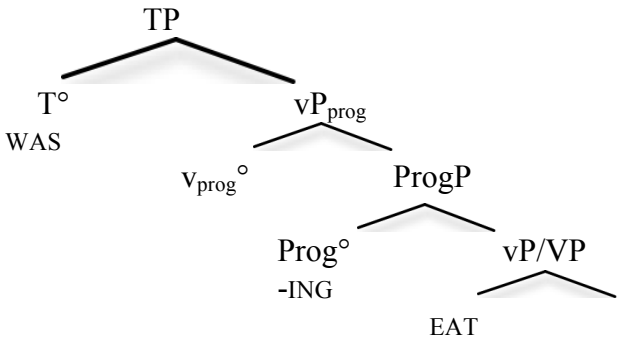
The second option is that explored in Lasnik's (1995) and Baker's (2003) hybrid approach. Under this approach, the lexical verb, unlike auxiliary verbs, enters the derivation without any kind of inflectional feature. Therefore it doesn't undergo raising. This means that an inflectional head in the clausal hierarchy, whether T° or an Aspect°, will never be filled. I illustrate this in the examples below with progressive aspect and the lexical verb *eat*:

(66)



The unfilled inflectional head, in this case Prog°, is therefore subsequently spelt out in accordance with the specifications of its interpretable feature. Because no verb or auxiliary occupies this position, however, it is simply spelt out as the pure inflectional affix. In the case of Prog°, this head is spelt out as *–ing*:

(67)



Because of the Stranded Affix Filter (SAF; Lasnik 1995, 1999), which states that:

(68) A morphological realised affix must be a syntactic dependent of a morphologically realised category at surface structure,

the progressive *–ing* affix is in danger of violating the SAF since it currently has no host. In order to solve this, the progressive *–ing* inflection adjoins to the lexical verb under PF linear adjacency, *à la* Marantz (1988), Bobaljik (1994), Lasnik (1995) and Baker (2003):

(69) Pinocchio was –ING + EAT = Pinocchio was eating.

Finally, the third option available is an elaboration of an idea mentioned in passing by Bjorkman (2011). Bjorkman tentatively suggests that the directionality of Agree could be parameterised across languages. That is, some languages may operate under Standard Agree, whilst others may operate under Reverse Agree. This could be taken one step further by claiming that the directionality of Agree could be parameterised within languages. Namely, auxiliary verbs in English could operate under Standard Agree, hence the need for them to raise to check their inflectional features, whereas the lexical verb could operate under Reverse Agree, hence the reason why it doesn't raise. This is for now a tentative suggestion, but a plausible one if one assumes, as per Haegeman & Lohndal (2010) and Merchant (2011), that both Standard Agree and Reverse Agree are valid operations within any one language.

By now it seems clear that English auxiliary verbs, whether finite or non-finite, behave differently from the lexical verb in that the former demonstrate properties of raising in various contexts, whilst the latter exhibits no properties of raising whatsoever. However one wishes to analyse auxiliary verbs, accounting for the lexical verb under the same system will always give rise to extra stipulations. Whilst a number of the formalisations mentioned in this paper may be able to explain the facts, the issue still remains of why this distinction between lexical verbs and auxiliaries should exist in the first place. This is obviously a long-standing issue and one which goes beyond the scope of this paper.

In the next sub-section, I briefly explore why *being* should pattern so differently from other auxiliaries, as observed in section 4.

6.2 Setting 'being' apart

Despite the advantage that the auxiliary raising analysis has in explaining the *be/been* vs. *being* distinction, there is no consensus as to how exactly this distinction should be analysed. Here, I present the two different basic approaches.

In order to explain the *be/been* vs. *being* distinction, various proponents of the auxiliary raising analysis (in its various guises), namely Akmajian & Wasow (1975), Akmajian, Steele & Wasow (1979), Iwakura (1977), Lobeck (1987), Bošković (2004, to appear) and Thoms (2011) have proposed that whilst all other auxiliaries raise for inflections, *being* is inflected in its base position of Voice°/v° (depending on one's exact analysis), where it subsequently remains. The advantage to this is that VPE and VPF-type phenomena have been standardly assumed to target the vP/VoiceP layer (Akmajian & Wasow 1975; Zagona 1982; Johnson 2001, 2004; Merchant 2001, 2008, to appear; Aelbrecht 2010, Bošković to appear). Having *being* remain in its base position of Voice°/v° allows one to explain why *being* is affected by these phenomena, whilst remaining consistent with prior analyses.

Bošković (2004, to appear), Thoms (2011) and Sailor (2012) cite evidence from English existential constructions and FQs in defence of the non-raising of *being*. As already illustrated in (44), (45), (47) and (48) (repeated here as (70), (71), (72) and (73)), FQs, and associates of existential constructions, must obligatorily precede *being*:

(70) a. There were many smurfs **being** arrested for anti-social behaviour.
b. * There were **being** many smurfs arrested for anti-social behaviour.

(71) a. There was a gang of smurfs **being** rather loud and obnoxious.
b. * There was **being** a gang of smurfs rather loud and obnoxious.

(72) a. The students are all **being** arrested by the police.
b. * The students are **being** all arrested by the police.

(73) a. They are all being noisy
b. * They are **being** all noisy.

Under Sportiche's (1988) and Shlonsky's (1991) analyses, FQs are adjoined to subjects in their base positions and can be stranded in any position the subject occupies, including that of its base position. Similarly, associates are believed to act as the logical subjects of the sentence but are prevented from raising out of their base positions by merger of the expletive *there* into the canonical subject position. Therefore, FQs and associates potentially represent the base positions of subjects. If subjects are merged in Spec-vP/VoiceP, and *being* remains in v°/Voice° as Bošković (2004, to appear), Thoms (2011) and Sailor (2012) assume, then we have an instant explanation for why FQs and associates must precede *being*: they are merged above *being* and *being* never raises over them. However, this argument is only potentially applicable to the copular instances of *being* in (71) and (73). In (70) and (72), the subject is the derived subject of a passive verb, meaning it originated as the complement of V°. If FQs and associates truly represented the base positions of subjects, we would expect these elements to appear post-verbally, contrary to fact (Sportiche 1988; Bobaljik 2001; Bošković 2004; Cirillo 2009; Harwood 2011, 2012b, to appear):

(74) a. * There were being **arrested** many smurfs for anti-social behaviour
b. * The smurfs were being **expelled** all from school.

Therefore, if FQs and associates of passive constructions are not found in their base, post-verbal positions, it is not entirely clear what position they are occupying when appearing to the left of *being*. It is just as likely that they are occupying Spec-ProgP or Spec-vP_{prog} as it is that they are occupying Spec-vP/VoiceP. This furthermore implies that we can also not be entirely certain whether FQs and associates in the copular constructions in (71) and (73) are occupying their base positions either. Hence these data cannot conclusively show that *being* remains in v°/Voice°.

The most fundamental problem with the 'non-raising of *being*' account is that the proposal is a stipulation. There is no principled reason why *being* should not raise like other auxiliaries. The authors try to motivate this non-raising of *being* through mechanisms such as structural adjacency (Embick & Noyer 2001), but it remains a stipulation that such machinery is operative only on instances of *being* and not on other auxiliaries.

Aelbrecht & Harwood (2012) and Harwood (2012a) have alternatively argued that all auxiliaries, including *being*, raise to agree with higher tense or aspectual projections, and that the *be/been* vs. *being* distinction can instead be attributed to VPE and VPF-type phenomena targeting the progressive layer of the clause rather than simply the VoiceP/vP layer as previously assumed. Since *being* surfaces in Prog° under this approach, and the aforementioned phenomena target the progressive layer, *being* is affected by them. Since *be* and *been* occupy positions above the progressive layer, they are not affected by ellipsis and fronting phenomena. The problem with this approach is that it is, as yet, a mere stipulation that these phenomena should target the progressive layer. Why do VPE and VPF-type phenomena not target the vP/VoiceP layer as is often assumed? Alternatively, why should the progressive layer be the only

aspectual layer to be targeted by these phenomena? Why is the perfect aspectual layer, for instance, not targeted?

A further problem with this line of analysis is that there are no particularly easy means of explaining the fact that FQs and associates must precede *being*. Under this approach, both elements must raise to and surface on the edge of the progressive aspectual layer, though it is not entirely clear what the motivations for such movement should be. This remains an open issue for proponents of this line of analysis.

In sum, it seems that whichever approach one takes to explain the unique behaviour of *being*, one must stipulate something extra, whether it be non-raising of *being*, or VPE and VPF-type phenomena targeting the progressive aspectual layer rather than the vP/VoiceP layer. In order to tease the two analyses apart, one must find evidence independent from auxiliaries which would demonstrate whether the aforementioned phenomena target the vP/VoiceP layer, or the progressive aspectual layer. This however, goes beyond the scope of the current article.

7. Summary and Conclusion

In this paper I have addressed the issue as to whether English non-finite auxiliaries raise to receive their inflections, or have their inflections lowered onto them. This essentially asks the question of whether the affix lowering or auxiliary raising accounts are better suited for fully capturing the auxiliary inflectional system of English. The affix lowering accounts predict that auxiliary distribution should be determined by auxiliary type and not by morphological form, whereas the auxiliary raising accounts predict that auxiliary distribution should be determined by morphological form and not by auxiliary type.

The affix lowering approaches were shown to be inadequate with regards to the empirical data, as a distributional distinction occurs between *be*/*been* and *being* across a range of phenomena. In other words, auxiliary distribution is in fact determined by morphological form and not by auxiliary type. This suggests that auxiliary raising is the correct analysis for the English auxiliary inflectional system. Due to some of the outdated mechanics of Chomsky's (1993) and Lasnik's (1995) auxiliary raising analysis, I presented an updated version. Crucially, the raising of the auxiliary is achieved through an application of Bošković's (2007) system of foot-driven movement, allowing movement of an auxiliary to a higher aspectual head to be driven by the auxiliary's need to check its own inflectional feature.

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