William Harwood

Rise of the Auxiliaries: a case for auxiliary raising vs. affix lowering

Abstract: The syntax of auxiliaries has given rise to much discussion in the generative literature (Akmajian and Wasow 1975; Emonds 1978; Akmajian et al. 1979; Pollock 1989; Chomsky 1993; Lasnik 1995b; Roberts 1998; Bjorkman 2011; Rouveret 2012). 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 across ellipsis, fronting and existential constructions in English that are difficult to capture under an affix lowering model, and lend themselves more easily to 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 (1995b) approach to the auxiliary system, though with the utilisation of Bošković's (2007) notion of foot-driven movement.

Keywords: auxiliary verbs, head movement, affix lowering, tense, aspect

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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. Finite auxiliary verbs, however, do raise to T° for tense/agreement. This is evidenced in Pollock (1989) by two basic facts: (i) finite auxiliaries precede the

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marker of sentential negation *not*, which is considered to be merged directly below T°, whereas lexical verbs do not (see (1)), and (ii), finite auxiliaries undergo Subject Auxiliary Inversion (SAI), for which movement to T° is usually a prerequisite, 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?*
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.[1]

The two analyses make starkly different predictions regarding the positions in which auxiliaries surface. 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

1 Affix lowering and auxiliary raising are not, however, the only two analyses available. See Sag et al. (2003), for instance, for an HPSG analysis. See also Schütze's (2003) and Cowper's (2010) auxiliary insertion theory, which I discuss in Section 7.2.

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 this paper demonstrates, 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 observed across ellipsis, fronting and existential constructions 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).[2]

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 two fundamental approaches to the English auxiliary inflectional system, namely the affix lowering account (Chomsky 1957; Marantz 1988; Baker 1991; Halle and Marantz 1993; Bobaljik 1994; Adger 2003; Bruening 2010; Bjorkman 2011; Wurmbrand to appear) and the auxiliary raising account (Emonds 1978; Pollock 1989; Chomsky 1993; Kayne 1993; Lasnik 1995b; Iatridou et al. 2001). Section 4 then presents the empirical disadvantages with the lowering analyses, namely the distributional distinction between *be* and *been* on the one hand, and *being* on the other. Section 5 discusses this distinction further and explores the various analyses that have been suggested in the literature, both from an affix lowering and an auxiliary raising perspective, to account for this data. I conclude that empirically, an account in which all auxiliaries uniformly raise for inflectional purposes is best suited for explaining this phenomenon. In light of this, an Agree-based auxiliary raising account is offered in Section 6, in which the movement of the auxiliary is motivated by a featural deficiency on the auxiliary itself. Before concluding in Section 8, Section 7 discusses a number of further issues, namely alternative accounts for the English auxiliary inflectional system, how the lexical verb might

2 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 I return to this point in Section 7.3. 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.

behave under the proposed analysis, why no apparent distributional distinction exists between *be* and *been*, and the cross-linguistic implications of this paper.

2 The articulated structure of the middle field

It has been observed by a number of authors (Akmajian and Wasow 1975; Tenny 1987; Cinque 1999, 2004) 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:

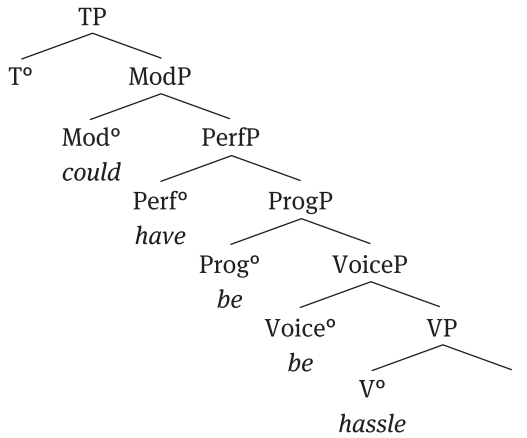
(4) a. **Cinderella must be having been hassled by her stepsisters.*
b. **Cinderella has must be being hassled by her stepsisters.*
c. **Cinderella is must have been hassled by her stepsisters.*

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. Several proposals (Tenny 1987; Cinque 1999, 2004; Bjorkman 2011; Bošković 2014) have led us to the following basic hierarchical structure:

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

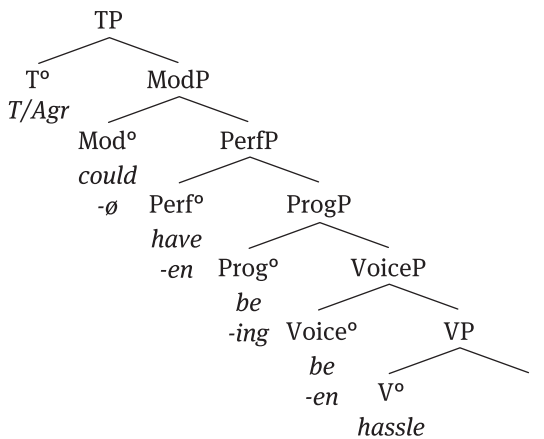
The lexical verb is merged in V°, passive *be* in Voice°, progressive *be* in Prog°, perfect *have* in Perf°, modals in Mod°, and tense/agreement in T°. Given that passive *be* and copula *be* are in complimentary distribution, I take copula *be* to be merged in Voice° as well (Baker 1997; Eide and Åfarli 1997; Bowers 2002; Aelbrecht and Harwood 2013; Harwood to appear), 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, 2004], or the WYSIWYG approach of Bošković [2014]).[3] 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 assume aspectual inflectional affixes are also merged into the heads of the aspectual projections with which they are associated. This is illustrated in (7):

(7)



3 In Section 3.2, when discussing the auxiliary raising analysis, I alter the hierarchy in (6) so as to include vP shells, in the heads of which auxiliaries are base generated rather than in the aspectual projections themselves.

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.

Before we go any further, it is worth motivating the presence of one particular phrase, namely, ModP. Whilst most of the other projections are assumed in the literature, there has been debate as to whether ModP actually exists, or whether modals are instead inserted directly into T°.

This is due to the fact that certain modals, which are themselves scope-taking items, are unable to scope below negation, as Roberts (1998) notes for epistemic *must*. In the sentence below, for instance, there is but one possible interpretation, namely that in which the modal outscopes the negative element:

(8) *You mustn't do that*
- 'You are obliged not to do that.' (Mod > Neg)
- #'You are not obliged to do that.' (Neg > Mod)

(Roberts 1998:(7))

Linearly, the modal precedes the negation marker *not*. Assuming that TP immediately dominates NegP, that the modal occupies T° and that NegP hosts negation (Pollock 1989), the relevant scopal reading: Mod > Neg, can easily be read off of the overt structure.

(9) $[_{TP}$ *must* $[_{NegP}$ *not* . . .

However, on the assumption that the modal is initially Merged in ModP, below NegP, and that it Moves to T°, above NegP, we would predict that the option should be available of privileging the modal at LF from its base position, crucially below the negative element.

(10) $[_{TP}$ *must* $[_{NegP}$ *not* $[_{ModP}$ t_{must} . . .

As (8) shows, however, such inverse scope relations are unavailable to epistemic *must*. If the modal cannot be interpreted below the negative element, this suggests that such modals were never merged below NegP in the first place and must instead have been directly Merged into T°.

Of course, this may be true for a narrow set of modals such as epistemic *must*, but as Roberts (1998) observes, this isn't the case for most other modals. Modal verbs such as *may* and *can* are indeed able to scope below negation.

Consider the two sentences below. With each sentence, two possible interpretations are available, one in which negation outscopes the modal, and one in which the modal outscopes negation.

(11) a. *Cinderella could not have gone to the ball.*
- It's possible Cinderella is not at the ball. (Mod > Neg)
- It's impossible that Cinderella is at the ball. (Neg > Mod)

b. *Cinderella may not go to the ball.*
- Cinderella does not have to go to the ball. (Mod > Neg)
- Cinderella is not allowed to go to the ball. (Neg > Mod)

In order for the modals in (11a) and (11b), which again surface in T° above negation, to be able to scope either above or below the negative element, the option must be available of privileging the modal at LF from either its surface position, or from a lower copy that is below the negative element. The only way in which it is possible for such a lower copy to exist is if these modals were originally merged below negation in the first place, and subsequently raised above it. Therefore it seems reasonable to posit a ModP below TP and NegP in which the majority of modals may be initially merged. Obviously certain modal verbs such as epistemic *must* need not be merged in this projection, but it appears to be a required merge position for many other modals.[4]

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

4 An anonymous reviewer raises the objection that the reading in which negation scopes below the modal is a case of constituent negation rather than sentential negation, and therefore that it is the negative operator itself which is privileged in a lower position rather than the modal. The issue of whether sentential or constituent negation applies in these examples is extremely complex and is something which warrants its own paper in order to properly discuss the matter. I therefore leave this problem open other than to say that if the different readings in (11) are dependent upon where the negative operator is privileged rather than the modal, why is it that the negative operator can only be interpreted below the epistemic modal in (8)? Surely the status of the modal should not be able to influence which position the negative operator takes scope from.

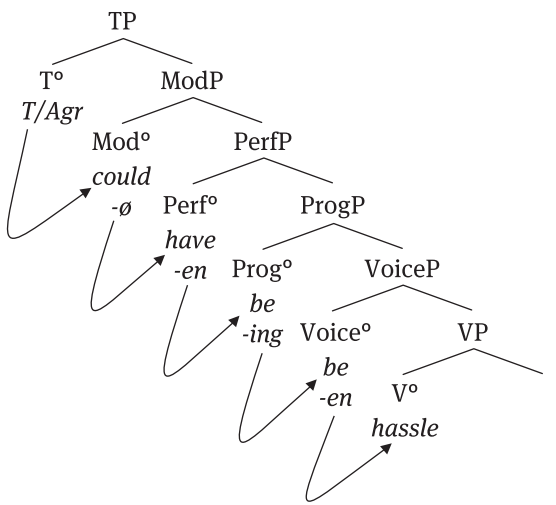
If it transpires however that all modals are uniformly merged in T°, this would not necessarily be detrimental to the paper as it stands. The hierarchy established in (7) could simply be adapted so that ModP does not exist and instead modals and infinitival inflections are generated in T°.

3 Analyses of the English auxiliary inflectional system

3.1 Affix lowering

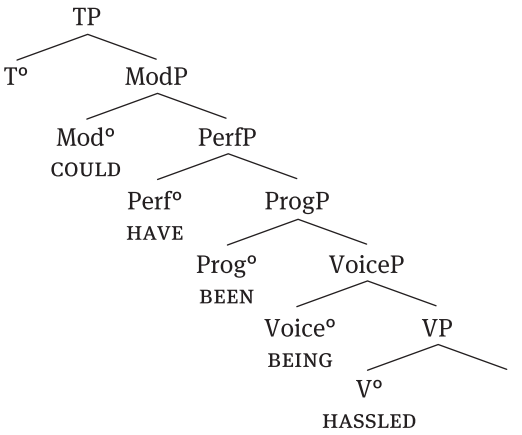
In Chomsky's (1957) original formalisation of the verbal inflectional system, he conjectured that aspectual inflections surface one position lower than the heads in which they are initially merged, attaching to the following auxiliary or lexical verb. This led to the proposal that verbal inflections are lowered onto the verbs. This mechanism came to be known as Affix Hopping. The diagram in (12) represents the Affix Hopping process itself, whilst the diagram in (13) represents the result of this process.[5]

(12)



5 Chomsky's (1957) original version of Affix Hopping actually took place over a linear structure. Updated versions of this proposal, such as Akmajian and Wasow (1975), transferred Affix Hopping to hierarchical structures as in (12).

(13)



Subsequently, however, with the development of a more principled theory of syntactic operations according to which construction specific transformations such as 'Affix Hopping' were replaced by operations governed by general principles of grammar, the movement derivation as illustrated in (12) became untenable. The development of trace theory in particular (Chomsky 1973, 1981) led to the postulation of the Empty Category Principle (ECP) (Chomsky 1981, 1986; Rizzi 1990) according to which traces of moved elements must be c-commanded by the moved element itself. The phenomenon described above as Affix Hopping, i.e. the movement of the inflection as illustrated in (12), is no longer conceived of as a construction specific transformation but is seen as an instantiation of head-movement, and is governed by the same principles that regulate phrasal movement. All things being equal, if the movement of the inflection in (12) creates a trace or a copy, i.e. an empty category, then this too is subject to the condition that it be c-commanded by the moved element. The c-command condition is not fulfilled in (12) in which in fact it would be the trace of the moved morpheme that c-commands the moved morpheme itself. All things being equal, the result of Affix Hopping is a clear violation of the ECP.

Due to this conceptual flaw, the Affix Hopping approach has been replaced by more theoretically appealing methods such as the Reverse Agree approach (Adger 2003; Bjorkman 2011; Wurmbrand to appear), selection theory (Baker 1991; Bruening 2010) or PF merger under adjacency (Marantz 1988; Halle and Marantz 1993; Bobaljik 1994; Embick and Noyer 2001). These accounts achieve the same effect as Chomsky's (1957) Affix Hopping model, but without recourse to actual downward head movement, therefore no ECP violation results. For ease of exposition I do not go into the specific details of each of these analyses and instead refer the interested reader to the above references. What is crucial for the

purposes of this article, is that all of the above mentioned approaches allow verbs and auxiliaries to receive inflections in their base positions, giving rise to the distribution shown in (13).

An 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 affix lowering approaches posit that after receiving inflections from T°, head movement of the finite auxiliary to T° may then occur. The major problem is that this raising is unmotivated, since the finite auxiliary has already received finite inflections from T°. 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 non-raising of the finite lexical verb in English, in which case this inherent property of T° to be filled by the finite element seems to disappear.[6]

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

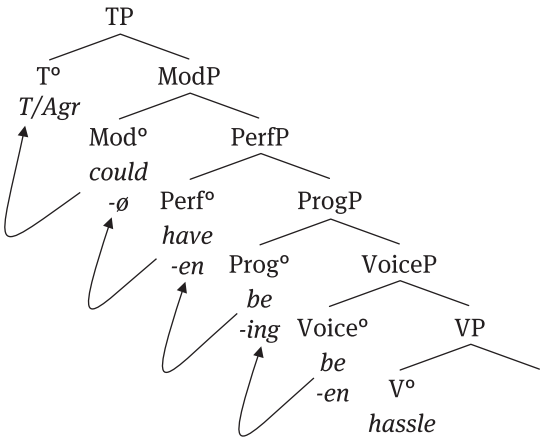
3.2 Auxiliary raising

An alternative to the affix-lowering hypothesis has been proposed by Emonds (1978), Pollock (1989), Chomsky (1993), Kayne (1993), Lasnik (1995b), Iatridou et al. (2001) and Bošković (2014): auxiliary raising. Under this system, auxiliaries raise from their base positions to higher inflectional heads to host the stranded inflections that are present there. 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:[7]

6 The selection theory of Baker (1991) and Bruening (2010) is slightly different in that they do not assume uniform raising of finite auxiliaries to T°, rather that finite auxiliaries are required to raise over negation when the negative operator is present, and optionally over intermediate adverbs. Once again, however, they struggle to give a principled motivation for such movement.

7 Certain instantiations of the auxiliary raising approach motivate verb raising for the purposes of abstract feature checking (Chomsky 1993; Lasnik 1995b), which I will discuss in Section 6.

(14)

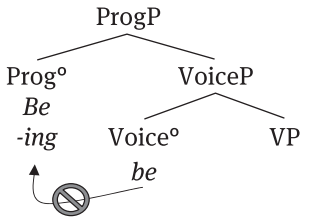


The advantage of the auxiliary raising approach over the affix lowering account is that it is able to treat all auxiliaries uniformly, whether finite or non-finite. That is, raising for reasons of inflection under this approach is an inherent property of all auxiliaries in English. Under the affix lowering 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 problem for the original 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, such as covert raising (Chomsky 1993) or merger under adjacency (Lasnik 1995; Baker 2003), 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 situ, receiving inflections in their base positions.

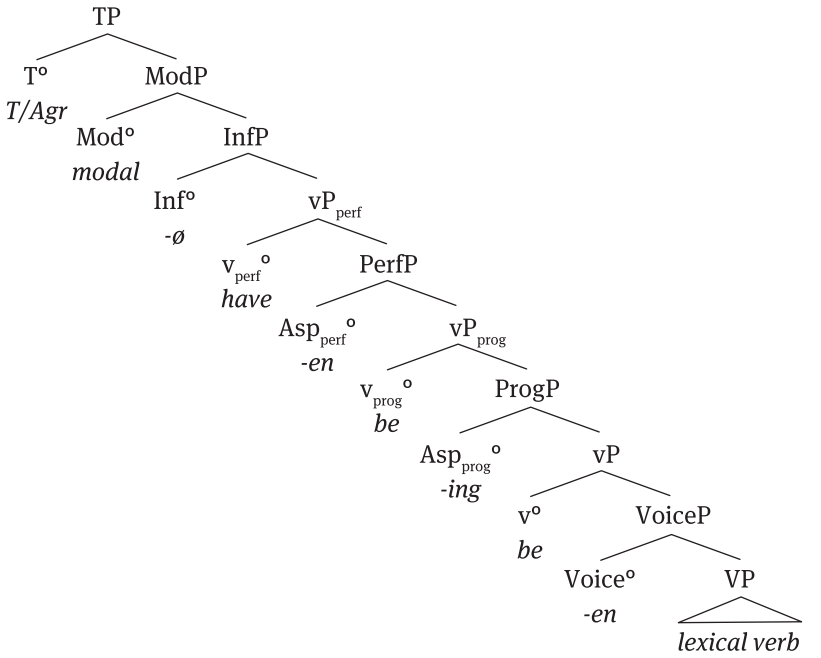
Note furthermore that the original auxiliary raising approach runs foul of the general requirement that heads should not be occupied by more than one morphological word (a kind of locality constraint, *á la* Chomsky [1986], Baker [1988] and Rizzi [1990]). For the remainder of the article we will term this the General Head Constraint (GHC). The process of auxiliary raising demonstrated in (14), and partially replicated in (15), quite clearly exhibits movement of a non-finite auxiliary into a head that is already occupied by another auxiliary, a direct violation of the GHC:

(15)



In order to ensure that each auxiliary has a space to move to, and therefore avoid a GHC violation, we must postulate a more articulated structure which has independent positions for auxiliaries and inflections. When one considers that English auxiliaries belong to the category of verbs and share most morphological properties with verbs, it makes sense that auxiliaries should perhaps be merged in their own vP shells. Therefore, I posit a vP shell on top of every aspectual projection, in the head of which the auxiliary selecting that particular aspectual form is base generated. The heads of the aspectual projections themselves host the relevant aspectual inflections, 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:

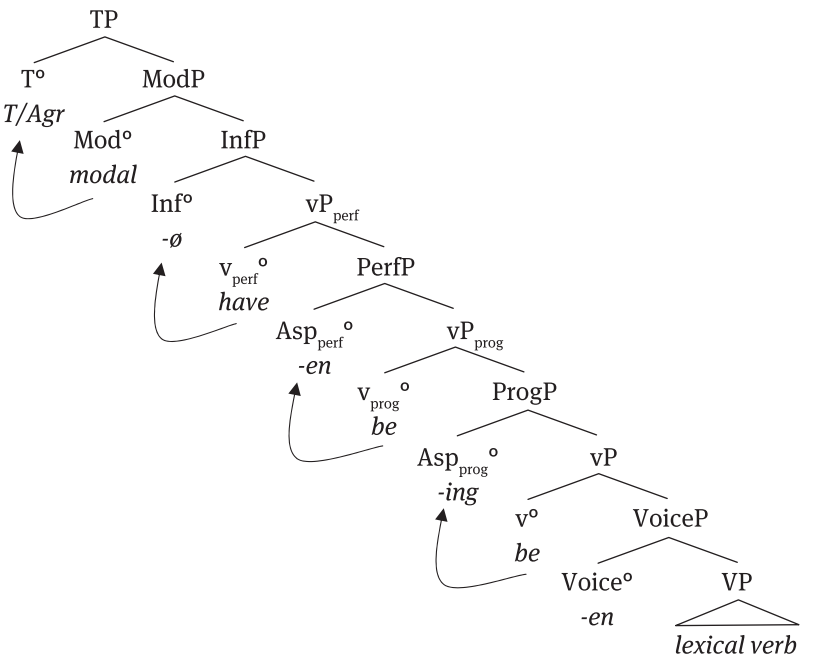
(16)



To be precise, tense and agreement inflections are merged in T° as standardly assumed, modals are merged in Mod°, whilst the infinitival inflections that are introduced by modals are situated directly below this in a projection labelled Inf°.[8] The perfect auxiliary *have* is merged below this position in the vP shell v_{perf}°, and the perfect *-en* inflection it selects is the head of its complement PerfP. The progressive auxiliary is merged in v_{prog}°, and the progressive *-ing* inflection introduced by the auxiliary is situated directly below this in Prog°. The passive auxiliary is then merged in v°, and the passive inflection it selects heads its complement VoiceP. Labelling aside, this is essentially the system that Kayne (1993), Iatridou et al. (2001), Deal (2009) and Bošković (2014) arrive at.

When head movement of the auxiliaries applies within this hierarchy, no GHC violations ensue:

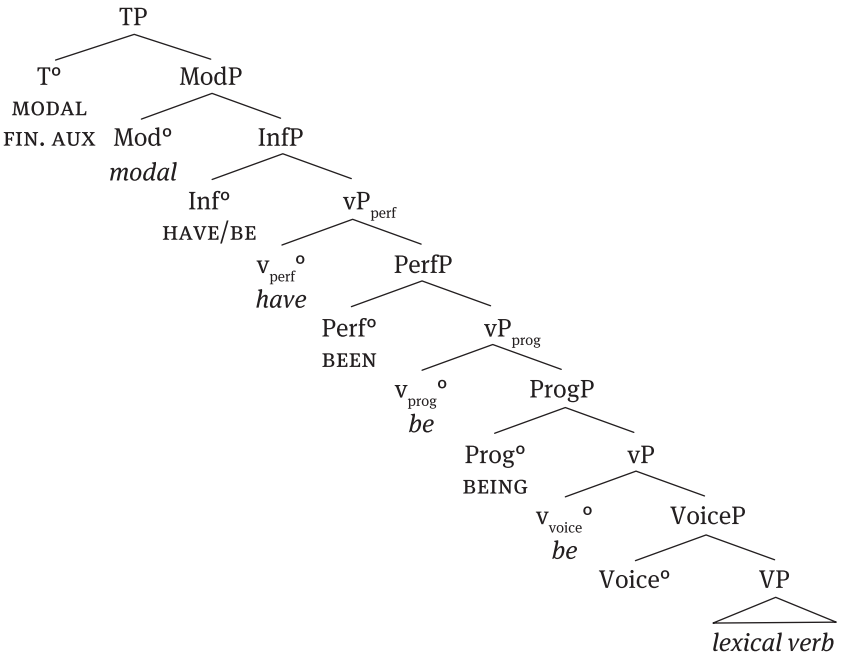
(17)



This gives rise to the following potential distribution of auxiliaries in English (the italicised forms represent the base positions of the auxiliaries, and the capitalised forms are their spell-out positions):

8 If one would rather claim that modals are uniformly merged in T°, as discussed in footnote 4, then ModP could simply be abandoned altogether. However, InfP, hosting the infinitival inflection, would have to be retained and would be directly merged beneath TP.

(18)



This makes clear the need for vP shells under an auxiliary raising approach, and therefore the hierarchical structure posited above. This necessity of postulating vP shells however is a disadvantage of 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. Note of course that no such GHC violations arise under the affix lowering approaches, since non-finite auxiliaries do not raise. Therefore vP shells are not needed under the affix lowering approach and each auxiliary can instead be merged directly into the relevant aspectual head. This is a distinct advantage for the affix lowering analyses over the auxiliary raising analyses.

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

(19) Affix lowering:
  a. Advantages:
    – Treats lexical verbs and non-finite auxiliaries uniformly.
  b. Disadvantages:
    – Must posit additional head movement for finite auxiliaries.
    – Must explain why such head movement is unavailable for finite-lexical verbs.

(20) Auxiliary raising:
  a. Advantages:
    – Treats auxiliary verbs uniformly.
  b. Disadvantages:
    – Must posit additional machinery for non-raising of lexical verbs.
    – Must posit vP shells to avoid GHC violations.

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 explain why the finite auxiliary raises to T° and also why the finite lexical verb doesn't. In the case of auxiliary raising, one must posit extra machinery to account for the non-raising of the lexical verb, as well as having to rely on vP shells to prevent GHC violations.

In sum, at this point neither model appears to emerge as theoretically superior to the other.[9] Therefore in the next section we turn 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

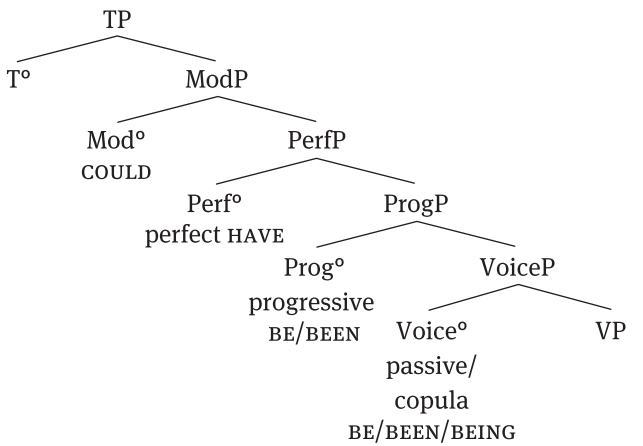
In this section I show that, for the purposes of the English auxiliary inflectional system at least, the affix lowering accounts are inadequate when it comes to capturing all the empirical data, whilst the auxiliary raising accounts are more suited to explain the facts.

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 remain in situ and receive inflections from higher aspectual projections. This means that non-finite auxiliaries are predicted to surface in their base positions,

9 One might even argue at this point that the affix lowering hypotheses emerge as slightly superior to the auxiliary raising hypotheses given that they are not reliant upon semantically unmotivated vP shells.

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 affix lowering has taken place:[10]

(21)



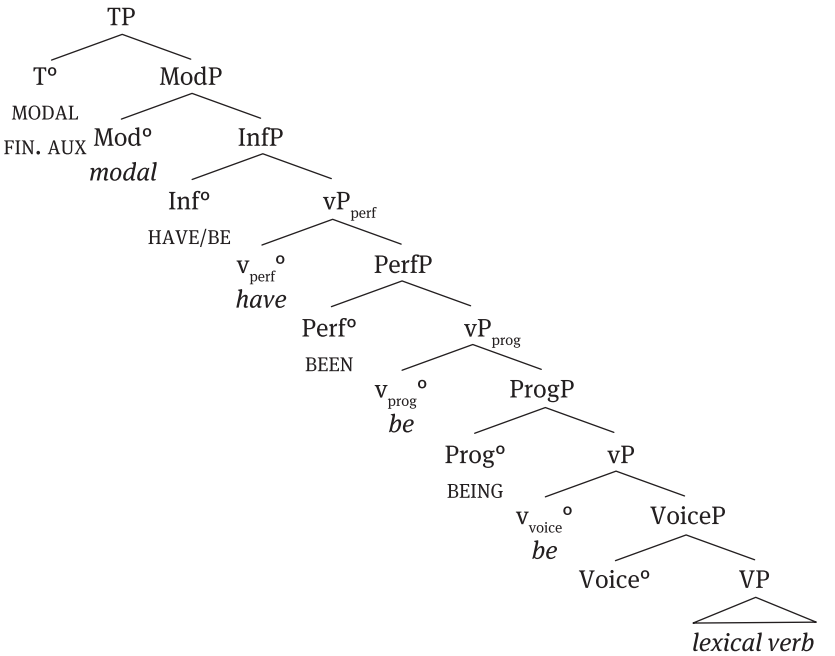
In other words, the modal is predicted to receive its inflections in Mod° (prior to head movement to T° because it is finite), the non-finite perfect auxiliary *have* is predicted to surface in Perf°, the progressive auxiliary, whether realised as *be* or *been*, is predicted to surface in Prog°, and 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:[11]

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

11 Recall that the structure of the middle field is somewhat more elaborate under an auxiliary raising approach due to the dependence on vP shells.

(22)



In other words, modals and finite auxiliaries raise to T°, whilst Inf° 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 instances 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 distribution is influenced by the morphological form of the auxiliary, as predicted by the auxiliary raising approach and contra the affix lowering accounts. This is demonstrated in Sections 4.1 to 4.6 using evidence from existential constructions, VP ellipsis, tag-questions, VP fronting, pseudo-clefts and predicate inversion, respectively. Section 4.7 takes stock of this data and discusses the evidence offered by Bjorkman (2011) in favour of the affix lowering analysis.

4.1 Existential constructions

Existential constructions are typically characterised by a semantically contentless expletive, *there*, occupying the canonical subject position, whilst the logical

subject, hereby referred to as the associate, occupies a lower position in the clause:

(23) *There was a gang of smurfs dancing in the garden last night.*

Regarding English passive existential constructions, Milsark (1974) and Harwood (2011) have noted that the passive auxiliary must follow the associate when inflected for progressive morphology, i.e. *being*, but must precede the associate when inflected for perfect or infinitival morphology, i.e. *been/be*:[12]

(24) 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.*

Similarly, the copular auxiliary obligatorily follows the associate when realised as *being*, but precedes it when realised as *be* or *been*:

(25) 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.*

Since inflections always appear on the following auxiliary, the progressive auxiliary itself does not surface in the progressive form *being*. However, when realised

12 It has been argued by Jenkins (1972), Williams (1984), McNally (1997) and Law (1999) that the material following the associate in existential constructions of the type depicted in (24)–(26) in fact constitutes a reduced relative clause (RRC) which modifies the DP associate:

(i) [$_{TP}$ There was [$_{DP}$ a gang of smurfs [$_{RRC}$ being arrested for anti-social behaviour]]].

If this were the case, the observations made in (24)–(26) would actually show us nothing about the distribution of *being* in a matrix clause. Whilst an RRC-analysis is indeed available to existential constructions, Milsark (1974), Barwise and Cooper (1981), Keenan (1987), Lasnik (1995), Lumsden (1998), Chomsky (2001), Huddleston and Pullum (2002), Caponigro and Schütze (2003), Rezac (2006), Deal (2009), Aelbrecht and Harwood (2013) and Harwood (to appear) have shown, with numerous diagnostics, that these constructions can be equally derived from a matrix clause. Therefore the distribution of the auxiliaries observed in these sentences remain valid for the point being made.

as *be* or *been*, this auxiliary patterns with the passive and copular auxiliaries of the same morphological form by preceding the associate:

(26) 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.*

Essentially the data demonstrates that the auxiliaries *be* and *been* uniformly raise to positions beyond the associate, whilst *being* does not. Therefore we can claim in this instance that the distribution of the auxiliary in relation to the associate is sensitive not to the specific type of auxiliary (passive, copular or progressive), but rather to the inflectional form it takes.

As the following five 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 its position, but the morphological form.

4.2 VP ellipsis

Ellipsis is the non-pronunciation of certain domains of syntactic structure. English VP ellipsis (VPE) typically involves non-pronunciation of the domain containing the lexical verb and its internal arguments:

(27) *Apollo punched Rocky, and Mr. T did [~~punch Rocky~~] too.*

Akmajian and Wasow (1975), Sag (1976) and Akmajian et al. (1979) have observed that under VP ellipsis (VPE), *being*, whether passive or copular in origin, is obligatorily elided, whilst *be* and *been*, whether progressive, passive or copular, can escape ellipsis:[13]

13 Whilst *being* is obligatorily elided, *be* and *been*, whether progressive, passive or copular in origin, can in fact be optionally elided. See Akmajian et al. (1979), Thoms (2011, 2012), Sailor (2012), Aelbrecht and Harwood (2013), Harwood (to appear) and Bošković (2014), all of who posit some form of auxiliary raising, for various explanations of this phenomenon.

Ellipsis of auxiliaries however is always with the proviso that the relevant auxiliaries have an identical antecedent. As Warner (1986) and Lasnik (1995b) have noted, ellipsis of auxiliaries is impossible if they do not have an identical antecedent:

(i) *Cinderella was made to eat Spinach because Popeye had *(**been**).*
(ii) *Cinderella was made to eat Spinach, and now Popeye will *(**be**).*

(28) 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****.*

(29) 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.*

(30) 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.*

This once again suggests a distributional distinction between *be* and *been* on the one hand, and *being* on the other. That is *be* and *been* raise to positions outside of the ellipsis site, whilst *being* does not.[14]

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14 Baker et al. (1989), following Sag (1976) and Lobeck (1987), have claimed that the obligatory ellipsis of *being* under VPE actually shows nothing about the distribution of auxiliaries and the constituent which VPE targets, but rather reflects a general property of VPE in that it cannot apply when governed by a V+*ing* form. Evidence for this comes from the fact that VPE is not permitted following a gerund either:

(i) **I remember Mary having eaten an apple, and Gary having, too.*
(ii) **I remember Mary having been angry about it, and Gary having, too.*

(Baker et al. 1989:(81))

In the case of *being*, if VPE cannot apply following any form of *-ing*, then it has no choice but to include the *being* form within the ellipsis site in order for VPE to be licit. This easily explains the obligatorily ellipsis of *being*. However, there are a number of problem facing this analysis. First of all, Abney (1987), Malouf (1998) and Hudson (2003) have all noted that gerunds cannot be elided, even though common nouns in the same environment can be:

(iii) **John's passing the exam was surprising, and Bill's was even more so.*
(iv) *John's success in the exam was surprising, and Bill's was even more so.*

This contrasts with *being* which obviously can be elided. If gerunds therefore cannot be elided, despite appearing in a context in which ellipsis is licensed (as evidenced by the NP ellipsis in (iv)), whereas *being* can be elided, this suggests that the connection between the two in terms of ellipsis is untenable. That is, if it is simply the case that ellipsis cannot apply following an *-ing* form, why is it that the syntax treats *being* and gerunds entirely differently when it comes to ellipsis: the ellipsis site is somehow expanded to include *being* when this auxiliary is present, whereas the ellipsis is not stretched to included the gerund? In fact, gerunds actually witness a positive reduction of the ellipsis site so that it is not immediately governed by the *-ing* form:

(v) Which bother's you more, John's having been arrested for drug dealing, or Bill's having been?

This contrast in behaviour between *being* and gerunds under ellipsis I consider to be problematic for Baker et al.'s (1989) approach.

4.3 Tag-questions

Tag-questions are interrogative clauses that are tagged onto the end of a declarative, usually as a means of seeking affirmation from the listener.

(31) *Popeye was eating his spinach heartily, wasn't he?*

The omission of the lexical verb and its internal arguments in these clauses has been analysed by Huddleston (1970) and Sailor (2009), among others, as involving VP ellipsis. In light of this, Akmajian and 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 copula in origin, is obligatorily elided, whilst *be* and *been*, whether progressive, passive or copula in origin, can escape ellipsis:[15,16]

(32) 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****?*

The second problem is that the *-ing* form found in gerunds is not the same as progressive *-ing*, as demonstrated by the fact that progressive *-ing* and gerunds are not in complementary distribution (thanks to Jeroen van Craenenbroeck for the following examples):

(vi) *John's repeatedly having been running for office was starting to annoy us.*
(vii) *Play resumed just after four o'clock, the pitch having been sweating under the covers in the meantime.*

Therefore it might be spurious to claim that ellipsis cannot apply after *-ing* forms if, whilst morphologically identical, the two *-ing* forms exhibit completely different syntactic functions. For these reasons I believe the generalisation linking the obligatory ellipsis of *being* under VPE and the inability for VPE to apply immediately following a gerundive *-ing* form to be untenable.

Finally, it is also worth mentioning that Sag's (1976), Lobeck's (1987) and Baker et al.'s (1989) generalisation misses the fact that *being* is not only uniquely privileged by VPE, but also by fronting phenomena (as illustrated in Sections 4.4–4.6) and existential constructions (as was illustrated in Section 4.1). By attributing the ellipsis of *being* to a peculiar fact about ellipsis itself, one is unable to explain why *being* behaves apart in phenomena other than ellipsis.

15 British English and some reported dialects of American English behave 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 property of being optionally elided.

(33) 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****?*

(34) 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****?*

4.4 VP fronting

VP fronting (VPF) involves preposing of the domain containing the lexical verb and its internal arguments to the left periphery of the clause:

(35) *If Fry says that Bender is coming to dinner, then [coming to dinner]$_i$ he is t_i*

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

(36) *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.*

(37) *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.

(38) *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.*

(39) *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.*

(40) *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.* (Roberts 1998:117)

(41) *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.* (Roberts 1998:117)

(42) *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.* (Akmajian et al. 1979:23)

(43) *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.*

This data illustrates therefore that the auxiliaries *be* and *been* must raise to positions beyond the constituent that is fronted, whilst *being* does not raise out of the preposed constituent.

4.5 Pseudo-clefts

A parallel case to VPF is that of specificational pseudo-clefting, which has been argued to involve fronting by Blom and Daalder (1977), Declerck (1988), Den Dikken (1995), Heggie (1988), Heycock (1994), Higgins (1979), Moro (1997) and Verheugd (1990) (cited in Den Dikken [2006]).

(44) A. *Aladdin should be punished for his actions.*
B. *No, [praised for his actions]$_i$ is what Aladdin should be t_i.*

Sailor (2012) observes that such instances of fronting 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]

(45) *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.*

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**).*

(46) *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.*

(47) *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.*

(48) *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.*

(49) *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.*

(50) *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.*

4.6 Predicate inversion

Hooper and Thompson (1973), Emonds (1976), Heycock and Kroch (1999) and Haegeman (2008) have analysed predicate inversion contexts as involving fronting of the verbal predicate:

(51) *[Speaking at today's lunch]$_i$ will be our local congressman t_i.*
(Emonds 1976:(38))

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:

(52) 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:(19)])
  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.

(53) 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.

(54) 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.

4.7 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 in existential constructions. All occurrences of *be* and *been*, on the other hand, can escape ellipsis phenomena, are obligatorily stranded by fronting phenomena and must precede associates. These properties are summarised in the table below:

(55) **Table 1:** Auxiliary distribution

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

These data are nothing new. As is evident from the references, these facts have been largely observed since the 1970s across various publications, though here they are collected together to highlight the genuine difference in behaviour between *be* and *been* on the one hand, and *being* on the other. Furthermore, these facts appear to have been largely ignored or forgotten by the more recent instantiations of affix lowering, that is, selection theory (Baker 1991; Bruening 2010), the merger under adjacency analysis (Marantz 1988; Halle and Marantz 1993; Bobaljik 1994) and the Reverse Agree approach (Adger 2003; Bjorkman 2011; Wurmbrand to appear). Indeed, 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. Without additional stipulations, the behaviour of each auxiliary would not be expected to depend on the morphological form it takes. Therefore, the facts presented above are problematic for the affix lowering models.

If auxiliaries raise 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: instances of *be*, irrespective of whether it is a progressive, passive or copular auxiliary in origin, would be expected to pattern differently from instances of *been*. Similarly, instances of *been* would pattern differently from instances of *being*. Whilst the data above does not demonstrate any real cases in which *be* patterns differently from *been* (a point which I return to in Section 7.4), the data quite clearly demonstrates that *being* behaves apart from *be* and *been*, irrespective of the type/function of the auxiliaries. This suggests that it is the actual morphological form of the auxiliary that determines its distribution. These facts conform with the predictions of the auxiliary raising models.

The only empirical evidence presented in support of the affix lowering analysis it seems, are two sets of data offered in Bjorkman (2011). The first set involves the distribution of auxiliaries with respect to the sentence-level adverb *fortunately*:

(56) 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.*
(Bjorkman 2011:(62))

(57) 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.*
(Bjorkman 2011:(63))

(56) shows that the adverb *fortunately* cannot follow the passive auxiliary, irrespective of the inflectional form it takes, whereas (57) 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 in (56) and (57). This data suggests therefore that auxiliary distribution is determined by auxiliary type and not by inflectional form, counter to the preceding arguments.

The data are not unproblematic however. First, with respect to Bjorkman's own material, 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.

In addition, a Google search reveals examples in which the passive auxiliary does precede *fortunately*:[18]

(58) a. *The exact words have been fortunately lost in the mist of memory.*
b. *A great deal of this history has been fortunately preserved and catalogued at The Kellor House Museum.*

Therefore the evidence in (56) and (57) cannot be said to be a conclusive argument in favour of the affix lowering approaches.

The second set of data advanced by Bjorkman (2011) in (59) essentially presents the same kind of argument as the data in (56) and (57):

(59) a. *The cakes have (all) been (*all) eaten.*
b. *Then children have (all) been (?all) eating the cake.*

18 The sentences provided in (58) and (58) have been respectively sourced from the following locations:
http://www.telegraph.co.uk/culture/books/bookreviews/9727511/The-Outsider-A-History-of-the-Goalkeeper-by-Jonathan-Wilson-review.html
http://www.keillorhousemuseum.com/geneology.htm

Floating quantifiers can apparently float to the right of the progressive auxiliary, but not the passive auxiliary, despite the fact that both auxiliaries carry the same inflections. This suggests that the passive and progressive auxiliaries occupy different positions. However, this data is once again far from clear cut, since it has also been reported in the literature that floating quantifiers can freely float after any instance of *be* or *been*, and that they are only restricted from floating in positions following *being* (Sportiche 1988; Bošković 2004, 2014; Haegeman 2008; Cirillo 2009):

(60) 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 (60b) and (60c) from Bošković [2014:25])

(61) 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 (61a) and (61b) from Bošković [2004:686])

(62) a. *The students could **be** all failing the exam.*
b. *The students have **been** all running in the marathon.*
(Example (62a) from Bošković [2004:694])

There is admittedly a degree of variation concerning the ability of *all* to float after *be* and *been*, with many speakers only permitting Q-float to the left of such auxiliaries, though this is generalised across all instances of *be/been* and is not specific to one auxiliary type. Irrespective, the data in (59) once again cannot be said to be a conclusive argument in favour of the affix lowering approaches.

I therefore 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 4.6 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.

Despite this, the facts in 4.1–4.6 have been analysed by Akmajian and Wasow (1975), Iwakura (1977) and Akmajian et al. (1979), and more recently by Sailor (2012), under an affix lowering account. In the following section I discuss this analysis and explain the problems with such an approach. I also discuss exactly

how proponents of the auxiliary raising approach have to date analysed the distinction between *be/been* and *being*, and outline the problems with this account also before presenting an alternative analysis.

5 The *be/been* vs. *being* distinction

I first explain how proponents of the affix lowering analyses have tried to account for the distributional distinction between *being* on the one hand and *be/been* on the other, and will outline the theoretical problems with this proposal. I then discuss how the auxiliary raising approach has to date explained the pattern, and once again provide an overview of the theoretical drawbacks with this approach. As will be seen, the unifying factor of the two accounts is that both essentially claim that passive/copula *be* and *been*, through various means, raise out of their base position, whilst *being* does not. In Section 5.3 I show this unifying assumption to be empirically flawed by presenting evidence involving the distribution of *being* with regards to adverbs which suggests that this auxiliary, like all other auxiliaries, raises for inflection. Based on this, I present an alternative analysis for the data.

5.1 Explaining the distinction under affix lowering

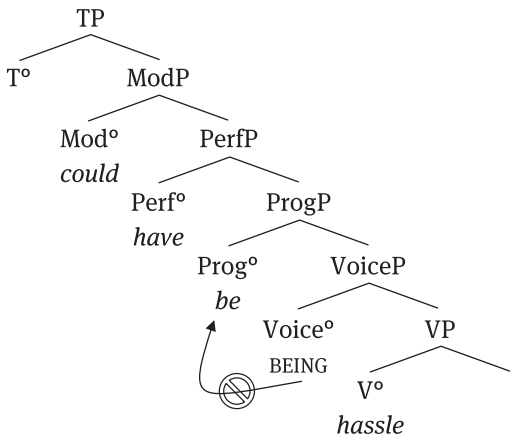
Adopting the affix lowering approach, Akmajian and Wasow (1975), Iwakura (1977), Akmajian et al. (1979) and Sailor (2012) assume auxiliaries receive inflections in their base positions. This implies that passive auxiliaries receive inflections in Voice°, whilst progressive auxiliaries receive inflections in Prog°.[19] These authors also assume that the entire range of aspectual projections consistently project in the underlying derivation, even when not overtly realised. For instance, the head corresponding to the base position of the progressive auxiliary (Prog° in our hierarchy) projects even in the absence of the progressive auxiliary.

In order to capture the distinction between *be*/*been* and *being*, the authors then claim that the passive auxiliary, once inflected, undergoes raising to Prog° if this position is empty. Let us consider exactly what this implies for the distribution of auxiliaries.

19 Akmajian and Wasow (1975), Iwakura (1977), Akmajian et al. (1979) and Sailor (2012) actually differ with regards to the labelling of projections and the exact manner in which affix lowering takes place. These facts aside however, the crucial basis of the analyses remains the same.

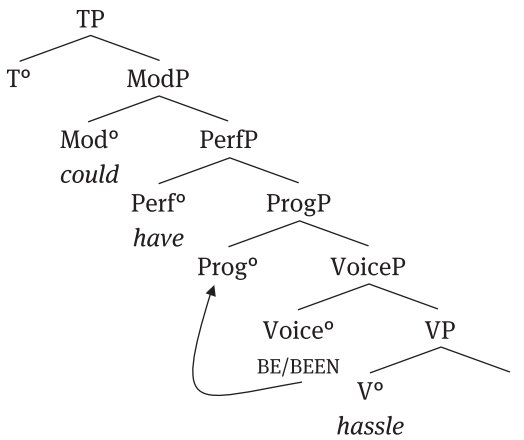
If both progressive and passive auxiliaries are present in the derivation Prog° will obviously be filled by the progressive auxiliary (or a trace of the progressive auxiliary if it is finite). The passive auxiliary, in Voice°, would subsequently be inflected as *being*. In this instance, the passive auxiliary is unable to raise out of Voice° to Prog° because Prog° is already filled, resulting in a GHC violation if *being* was to raise. Therefore *being* remains and surfaces in Voice°:

(63)



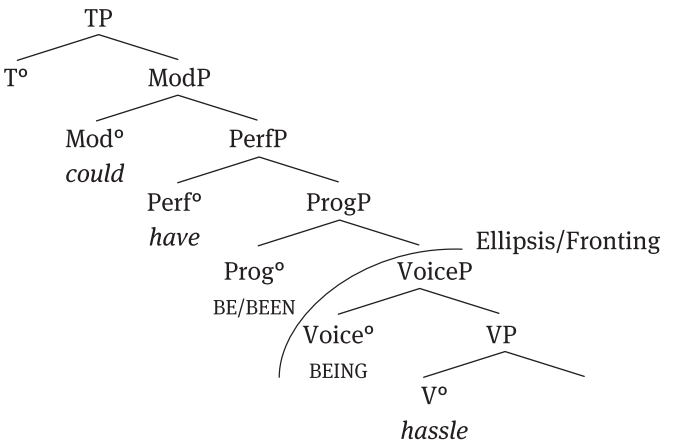
In the absence of the progressive auxiliary, however, the passive auxiliary, if non-finite, would be inflected as *be* or *been* in its base position of Voice°. From here the passive auxiliary would be able to undergo raising to Prog° as this position is empty, where it then surfaces:

(64)



Therefore, it is possible to create a distributional distinction between *be* and *been* on the one hand, and *being* on the other, under an affix lowering approach. In order to then explain why *being* is obligatorily targeted under ellipsis and fronting phenomena, the above-mentioned authors claim that these phenomena uniformly privilege VoiceP.[20] If *being* surfaces in Voice°, whilst *be* and *been* surface in Prog°, this would explain the different patterns of behaviour that these auxiliaries exhibit:

(65)



The distinct advantage to this approach is that it has been argued by Zagona (1982), Johnson (2001, 2004), Merchant (2001), Aelbrecht (2010) and Baltin (2012) that VPE and VPF uniformly privilege the VoiceP/vP projection anyway. Therefore, Akmajian and Wasow (1975), Iwakura (1977), Akmajian et al. (1979) and Sailor (2012) are able to explain why *being* is so noticeably affected by these constructions whilst conforming with prior analyses.

The fundamental problem with this approach however, is that the raising of *be* and *been* is a pure stipulation. At most the authors are able to allow for the raising of *be* and *been* by virtue of Prog° being empty, but they are unable to motivate such movement. The auxiliaries *be* and *been* have already received their inflections in their base position under this approach, so there is no reason for them to move, particularly to Prog°, which appears to bear no relation to the passive instances of *be* and *been*. Moreover, why would the infinitival instance of *be*

20 I stress, once again, that the advocates of this approach differ with regards to how the relevant phrases are labelled. VoiceP in this instance could also be understood as Chomsky's (1995) vP.

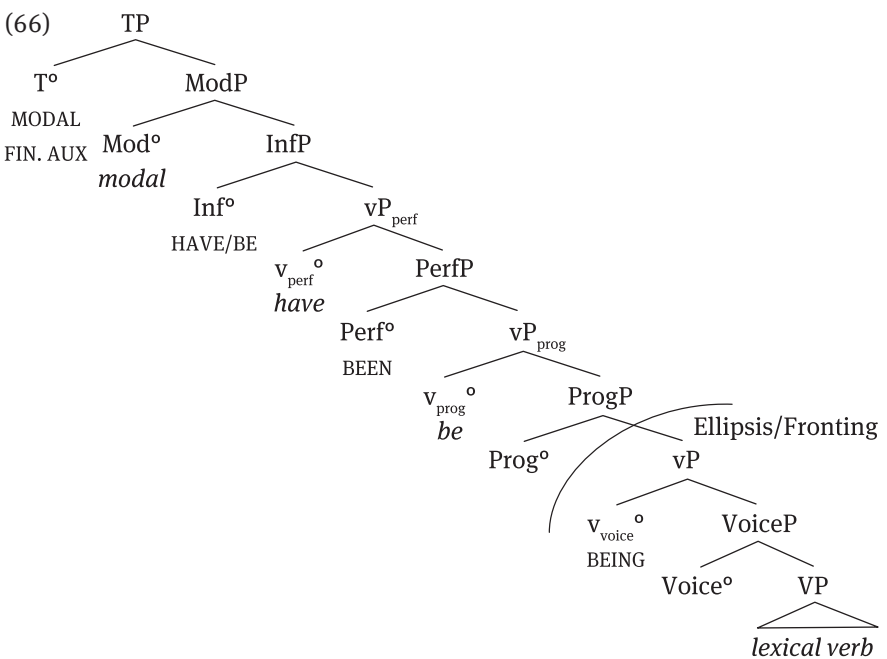
not move to Perf°, which would also be an available position for the auxiliary in the absence of perfect aspect? These issues remain something of a mystery for the affix lowering analyses.

In the following sub-section I discuss how the *be/been* vs. *being* distinction has to date been analysed by the auxiliary raising approaches.

5.2 Explaining the distinction under auxiliary raising

In order to explain the *be/been* vs. *being* distinction, various proponents of the auxiliary raising analysis (in its various guises), namely Lobeck (1987), Bošković (2004, 2014) 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, similar to the affix lowering approach, is that VPE and VPF-type phenomena have been standardly assumed to target the vP/VoiceP layer. Therefore, by having *being* remain in its base position of Voice°/v° allows one to explain why *being* is affected by these phenomena, whilst, once again, remaining consistent with prior analyses.

(66)



The problem with the 'non-raising of *being*' account is that there is no principled reason why *being* should not raise like other auxiliaries. Bošković (2004, 2014) claims it is because there are no intervening projections between Prog°, the locus of progressive inflections, and Voice°, where the passive auxiliary is merged. Therefore, the two elements satisfy the conditions for lowering under structural adjacency (Embick and Noyer 2001), which assumes two items to be structurally adjacent if one heads the other's complement, and permits downward head movement only in such environments.

(67) $[_{XP}\ X^{\circ}\ [_{YP}\ Y^{\circ}]]$

If VoiceP is the complement of ProgP, then the two are structurally adjacent. This implies that the progressive inflection in Prog° can be lowered onto the passive auxiliary in Voice°. As a result, *being* need not raise out of Voice° for inflections.

(68) $[_{ProgP}$ *-ing* $[_{VoiceP}$ *be*$]]$

However, Bošković (2014) explicitly assumes that projections are only present in the underlying derivation if overtly realised. Therefore, in the absence of progressive aspect, but in the presence of perfect aspect, ProgP would be absent and Perf° would be structurally adjacent to Voice°. Therefore, the conditions for lowering are once again met. Hence, perfect inflections would also be predicted to lower onto the passive auxiliary. The result is that *been* would similarly not raise out of Voice°, therefore losing any distributional difference between *been* and *being*.

(69) $[_{PerfP}$ *-en* $[_{VoiceP}$ *be*$]]$

In fact, all inflections are actually implied to be structurally adjacent to the auxiliaries to which they attach, predicting uniform lowering of affixes rather than raising of auxiliaries. This actually leaves Bošković's account without any means of accounting for the distributional distinction between *be* and *been* on the one hand, and *being* on the other.

Since there is no principled reason why *being* does not raise like other auxiliaries, the 'non-raising of *being*' account amounts to a stipulation. This therefore calls into question whether such an account is the correct representation for the English auxiliary inflectional system.

Essentially the two accounts discussed so far are unified in claiming that *being*, unlike *be* and *been*, is unable to raise out of its base position for one reason or another. In the following sub-section I turn to the empirical domain where I discuss whether there is reasonable evidence to claim that *being* remains in its base position or not. Ultimately I dispel the previous two analyses by showing, using the distribution of *being* with respect to adverbs, that *being* also raises for inflectional purposes.

5.3 Does *being* remain in situ?

Bošković (2004, 2014), Thoms (2011) and Sailor (2012) cite evidence from English existential constructions and FQs in defence of the notion that *being* does not raise out of its base position. If correct, this evidence would constitute an argument in favour of either of the two approaches outlined in Sections 5.1 and 5.2.

As already illustrated in (24), (25), (60) and (61) (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 (Zagona 1982; Kitagawa 1986; Speas 1986; Contreras 1987; Kuroda 1988; Koopman and Sportiche 1991), and *being* remains in v°/Voice° as Bošković (2004, 2014), 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):

(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°.

There is however, suggestive evidence that *being* actually uniformly raises to Prog° for inflectional purposes. In order to illustrate this, I turn to the distribution of *being* with regards to adverbs. Demonstrating the distribution of verbs and other functional items in relation to adverbs is often rather tricky. Whilst Cinque's (1999, 2004) functional and adverb hierarchies generally exhibit a fairly rigid ordering independently, the two hierarchies exhibit considerable flexibility when considered alongside one another, as has been noted by both Bobaljik (1999) and Cinque (1999, 2004). The situation is not helped by the fact that, according to Cinque, several types of adverbs have multiple positions of merger, and can also appear in various other positions with subtly different interpretations.

Despite this, there are certain adverbs which appear to have a very narrow distribution and which can be used to illustrate the surface position of *being*. In particular there are several classes of adverbs which Cinque (1999, 2004) has claimed are exclusively merged somewhere between the locus of progressive inflections, Prog°, and the base position of the passive/copula auxiliary, v°/Voice°. The adverbs in question are the generic adverbs, such as *characteristically*,[21]

21 In Cinque (1999), generic adverbs are actually merged in the specifier of ProgP. Since then however, Cinque (p.c.) has claimed that such adverbs should be separate from progressive aspect and should be merged somewhere below ProgP.

singular completive adverbs such as *completely*, manner adverbs such as *loudly*,[22] and Voice adverbs such as *well* (which Cinque claims to be merged in Spec-vP/VoiceP, above v°/Voice°).[23] Interestingly, all instances of *being* must obligatorily precede these adverbs:[24]

(75) a. *Jim Carey was (*characteristically) **being** (characteristically) annoying last night.*
b. *The Yankees were (*completely) **being** (completely) annihilated by the Red Sox.*
c. *John is (*completely) **being** (completely) disrespectful today.*
d. *The Yankees were (*loudly) **being** (loudly) booed by Red Sox fans.*
e. *The children were (*well) **being** (well) looked after.*

This contrasts quite nicely with those adverbs which Cinque (1999, 2004) claims to be merged directly above ProgP, namely proximative adverbs such as *soon*, retrospective adverbs such as *just* and continuative adverbs such as *still*, all of which *being* must obligatorily follow:

(76) a. *Bill was (soon) **being** (*soon) tried for his crimes.*
b. *Bill was (soon) **being** (*soon) rude to his guests.*
c. *The defendant was (just) **being** (*just) sentenced by the judge when the surprise witness showed up.*
d. *Jim Carey was (just) **being** (*just) annoying again when his ex-wife turned up and gave him a reason to calm down.*
e. *Despite the WWF's best efforts, rhinos are (still) **being** (*still) hunted for their tusks.*
f. *Dennis is (still) **being** (*still) rude to everyone he meets.*

This is suggestive evidence that *being* does indeed uniformly raise to Prog° for reasons of inflection and does not remain in its base position of v°/Voice°, con-

22 Many manner adverbs can occur elsewhere in the clausal hierarchy with a non-manner reading. Ernst (2001) however, has identified certain adverbs, such as *loudly*, which are exclusively manner adverbs and so can only occur in a very low position in the clause.

23 I do not necessarily intend to claim that each of these sets of adverbs are merged as specifiers within their own unique projections, as per Cinque (1999), merely that they are arranged between Prog° and the base position of the passive auxiliary. If one does not wish to follow the cartographic tradition, an alternative is to simply claim that the aforementioned adverbs are merged as multiple specifiers of vP.

24 Quite often these adverbs are only compatible with either a passive or copula construction, but not both.

trary to the analyses discussed in Sections 5.1 and 5.2. This therefore provides further support for an auxiliary raising approach in which all auxiliaries in English uniformly raise for reasons of inflection.[25]

Of course, if this is the case, one must ask the question of why *being* should be consistently targeted by ellipsis and fronting phenomena, and why it is the only auxiliary to follow the associate in an existential construction. In order to explain this I follow Wurmbrand (2012a), Aelbrecht and Harwood (2013), Harwood (2013, to appear) and Ramchand and Svenonius (2013) in claiming that the progressive aspectual layer, and all projections below it, constitutes a discreet unit of syntactic structure that is separate from tense, modals and higher aspectual forms such as perfect aspect. This unit of structure is uniquely privileged by ellipsis and fronting phenomena, and to the edge of which the associate raises in existential constructions:[26]

25 An anonymous reviewer offers an alternative view of the adverbs in (75) in which they are directly adjoined to the AP or VP predicate itself rather than to vP or projections beyond that. This would imply that such adverbs are automatically merged below the base position of *being*, and therefore that they demonstrate nothing about the distribution of this auxiliary.

The reviewer's argument is potentially supported by the fact that the adverbs in (75) can directly modify an AP inside an NP, always being positioned directly between the determiner or possessor, and the adjectival modifier:

(i) *He was being his characteristically annoying self*.
(ii) *A completely annihilated team*.
(iii) *A completely disrespectful comment*.
(iv) *The team's loudly booed players*.
(v) *A well-looked-after child*.

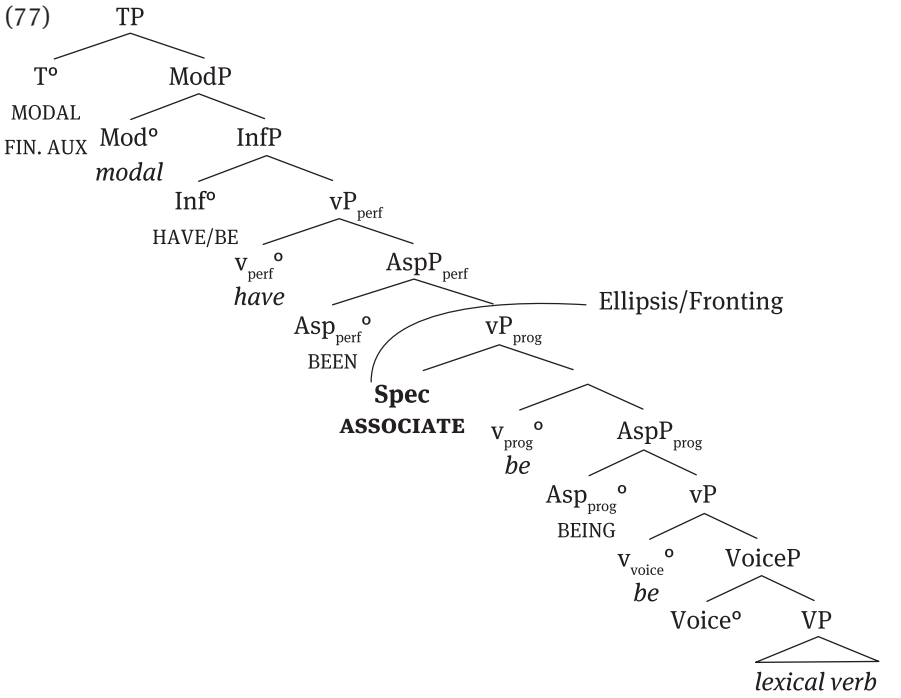
Of course, one could argue here that there is more structure present than meets the eye, and therefore that the adverbs are not necessarily directly adjoined to the AP itself. An important contrast that the reviewer notes, however, is that the adverbs which must appear to the left of *being*, i.e. the adverbs in (76), cannot occur between the determiner/possessor and the adjectival modifier:

(vi) **His soon tried compatriots*.
(vii) **A just annoying child*.
(viii) **A still rude child*.

If the reviewer is correct, then the data in (75) and (76) could not be used to argue in favour of an approach in which *being* uniformly raises for inflection. At the same time, however, the data would not argue against such an approach either. Therefore we would be left once again without a means of determining whether *being* raises or not. I leave this as an open issue for further debate.

26 This contradicts Merchant (2008, 2013), who claims that VoiceP escapes VPE in order to account for the permissibility of voice mismatches under VPE:

(77)



An in depth analysis of this divide is beyond the scope of this paper, which is mainly concerned with establishing that non-finite auxiliaries raise in English for reasons of inflection. I instead refer the interested reader to the relevant references above.

Obviously, claiming that existential constructions, ellipsis and fronting phenomena uniquely privilege the progressive aspectual layer is as much of a stipulation as claiming that *being* does not raise out of its base position. However, the above mentioned authors support their claim using evidence independent of the behaviour of *being*, namely data from idiomatic constructions (Harwood to appear), selectional restrictions (Aelbrecht and Harwood 2013), British English

(i) *The janitor must remove the trash whenever it is apparent that it should be [~~removed~~].*
(ii) *The system can be used by anyone who wants to [~~use it~~].*

However, as Merchant (2008, 2013) himself notes, examples such as those above are the exception rather than the norm. That is, voice mismatches under English VPE are generally unacceptable and are only permitted under exceptional circumstances. It seems therefore that VoiceP should generally be included in the ellipsis site in English, and only under exceptional circumstances is it recoverable or can escape ellipsis.

do (Ramchand and Svenonius 2013), additional insights into VPE (Aelbrecht and Harwood 2013, Harwood 2013) and temporal modification (Ramchand and Svenonius 2013) to show that the progressive aspectual layer and those projections below it constitute a discreet unit of structure. These data together show that the unique behaviour of *being* is not in fact attributable to a special property of *being* itself, but a special property of progressive aspect in general. The authors also try to justify this claim by proposing that progressive aspect, together with all projections below this position, constitutes the predicational/event description layer of the clause, whilst higher aspectual forms do not, and that this is the reason for such a divide.

This therefore justifies the need for an approach to auxiliary inflection in which all auxiliary verbs in English, whether finite or non-finite, uniformly raise for inflectional purposes. However, if the auxiliary raising analysis is to be adopted, a few refinements must be made to the system. 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.

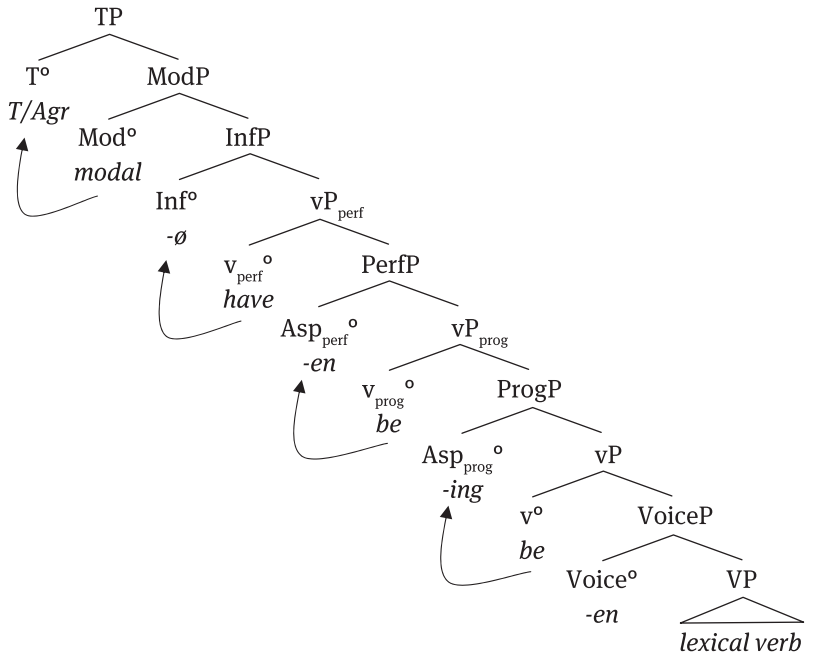
6 Auxiliary raising revisited

In this section I discuss the auxiliary raising approach in further detail. In Section 6.1 I discuss the outstanding problems with the auxiliary raising approach, whilst in Section 6.2 I offer a means of solving such issues.

6.1 Problems

As outlined in Section 3.2, under the auxiliary raising account auxiliaries are assumed to raise out of their base positions to higher functional heads in order to combine with the relevant inflectional affix:

(78)

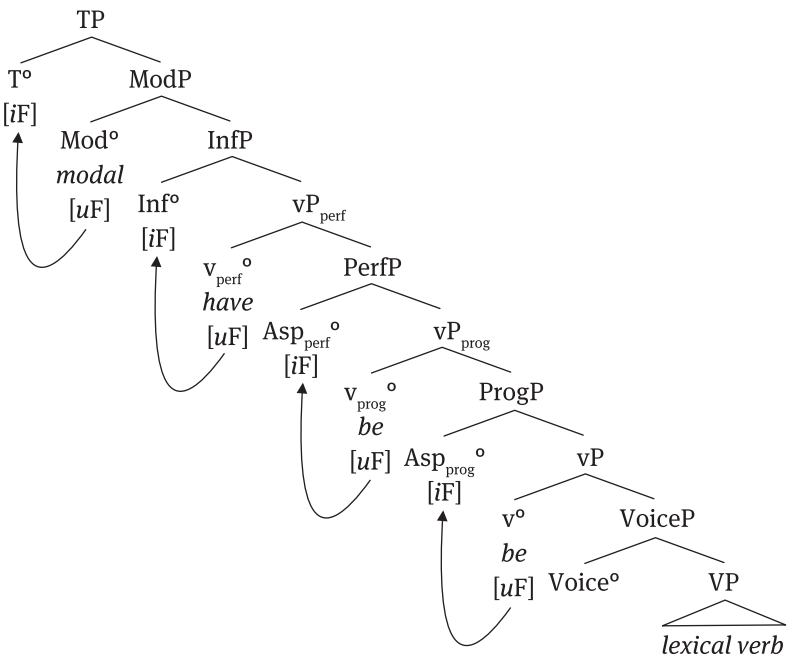


The first conceptual problem that this approach faces, however, is that Lechner (2006), Matushansky (2006), Iatridou and Zeijlstra (2012), Roberts (2010) and Hartman (2011) have all noted that verbal head movement can have a semantic impact. This has in fact already been potentially illustrated with the sentences in (11) in which head movement of the modals *could* and *may* from Mod° to T° allows these modals to take scope over negation.[27] This would imply therefore that head movement, and verb movement in particular, can have an effect at LF as well as PF and must therefore take place within the narrow syntax itself. If this is correct then the head movement depicted in (78) sits at odds with current minimalist assumptions. That is, movement in the narrow syntax is generally motivated by abstract 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 (78) takes place within the narrow syntax, as the above-mentioned authors claim, then it remains a mystery why such movement should not be featurally rather than morphologically motivated.

27 See Lechner (2006), Matushansky (2006), Iatridou and Zeijlstra (2012), Roberts (2010) and Hartman (2011) for in depth empirical discussion on the existence of LF effects in head movement.

One particular instantiation of the auxiliary raising account inadvertently solves this issue. Chomsky (1993) and Lasnik (1995b) 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 its own uninterpretable feature checked. This is illustrated in the diagram in (79). For the time being I abstract away from the precise specifications of these features, since this is a detail that neither Chomsky (1993) nor Lasnik (1995b) enter into.

(79)



Chomsky's and Lasnik's approach to the auxiliary inflectional system, however, was made redundant with the introduction of Agree (Chomsky 2000, 2001), which can be formalised as follows:

(80) *Agree*[28]
Agree is a relationship between two features such that an uninterpretable feature [*u*F] is checked by a feature [*i*F] of the same type iff:
a. A head α containing [*u*F] c-commands a head β containing [*i*F].
b. There is no head γ containing a matching feature [*i*F], such that γ c-commands β and α c-commands γ.

Essentially, Chomsky's (2000, 2001) version of Agree requires the c-commanding element (the Probe) to bear an unchecked feature which is licensed by a fully specified feature (the Goal) within its c-command domain:

(81) Agree (Chomsky 2000, 2001):
PROBE > GOAL
[*u*F] [*i*F]

Checking by Agree does not in itself trigger movement, however. Instead Chomsky (2000, 2001) assumes that when Agree is accompanied by movement, it is triggered by a specific feature on the Probe which is parasitic on the Agree operation. This feature must be checked locally by the Goal, therefore motivating the goal to move. This feature triggering the movement of the Goal is often referred to as a generalised EPP feature.

(82) Feature configuration for Movement:
PROBE > GOAL
[*u*F] [*i*F]
[EPP]

The Probe-Goal relationship of Agree, however, is featurally the opposite of what Chomsky (1993) and Lasnik (1995b) 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:

28 The original version of Agree was actually stated in terms of valued and unvalued features, though it can be equally stated in terms of interpretable and uninterpretable features. I appeal here to (un)interpretable features rather than (un)valued features so as to maintain coherency between Agree, which introduced feature valuation, and Chomsky's (1993) and Lasnik's (1995b) proposals, which were made prior to feature valuation. Furthermore, I follow the likes of Pesetsky and 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.

(83) Chomsky (1993), Lasnik (1995b):

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

This is at odds with the current understanding of movement in narrow syntax. In the following sub-section I offer a means of solving this issue.

6.2 Foot-driven movement

In what follows I elaborate an auxiliary raising approach to the English auxiliary inflectional system which maintains the feature checking approach proposed by Chomsky (1993) and Lasnik (1995b), but which is also compatible with the most standard assumptions on Agree.

I assume the featural configuration posited in (83) to be essentially correct, with the tense and aspectual heads fully featurally specified, whilst all auxiliaries are featurally deficient (i.e. uninterpretable). I also assume the standard model of Agree as proposed by Chomsky (2000, 2001). The question therefore is, how are auxiliaries able to raise to have their inflectional features checked or valued under these apparent paradoxical assumptions? To answer this question I adopt a version of Bošković's (2007) theory of foot-driven movement.[29]

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; see also Platzack [1996], van Craenenbroeck [2006] and Preminger [2008]). 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. There is

29 The term 'foot-driven movement' in this article refers to a movement operation which is driven by a featural deficiency of an item at the foot of an agreement chain rather than at the head of the chain. It bears no relation to the prosodic meaning of 'foot'.

therefore but one option available to X to prevent the derivation from crashing: Move. That is, upon construction of the following phrase, 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 spelled out in this position.

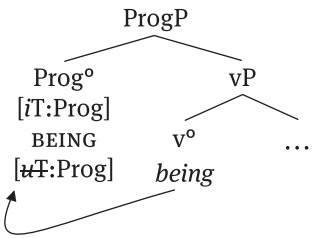
In this sense, movement is not dependent upon the moving element being probed by a higher item. That is, movement is always driven by the moving element's need to check its own feature. This approach to movement provides us with three advantages: first, successive cyclic movement comes for free as the 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).

Originally Bošković's (2007) theory was proposed for A and A′ movement. Here however, I will show how it can be applied to head movement in 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. Also, to be more precise about the specifications of the auxiliaries' inflectional features posited in Chomsky (1993) and Lasnik (1995b), I assume each auxiliary enters the derivation bearing an uninterpretable inflectional feature that is already valued for a certain tense or aspect and which must be checked against a matching interpretable inflectional feature on a higher tense or aspectual head. In accordance with 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 Agree have been established. Without any further motivation to move,

the auxiliary is then spelled out in this position in accordance with its feature specifications.[30]

I illustrate this mechanism with concrete examples. Consider the passive auxiliary *being*, merged in v°. By virtue of its morphology, *being* enters the derivation bearing an uninterpretable inflectional feature valued for progressive aspect: [*u*T:Prog], which must ultimately be licensed by an interpretable inflectional feature with a matching value: [*i*T: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, 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*T: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 Agree.[31] ProgP's [*i*T:Prog] is therefore able to check the auxiliary's uninterpretable [*u*T: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 spelled 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 spelled out.

(84)



30 An anonymous reviewer asks exactly how phrasal movement could be motivated under this system instead of head movement. I assume that in the case of phrasal movement, the unchecked feature is located on the highest head of a projection line, from which it is unable to move out of. The unchecked feature is subsequently inherited by the projected phrase and raises from here to check its feature, pied-piping the rest of the phrase along with it. For instance, I assume the unchecked Case feature of a nominal to be situated on D°, the highest head of the nominal projection. In this instance the unchecked Case feature is inherited by the DP itself. Now able to probe outside of its own DP, the unchecked Case feature is able to raise to get successfully checked, and pied-pipes the entire DP along with it, giving rise to phrasal movement.

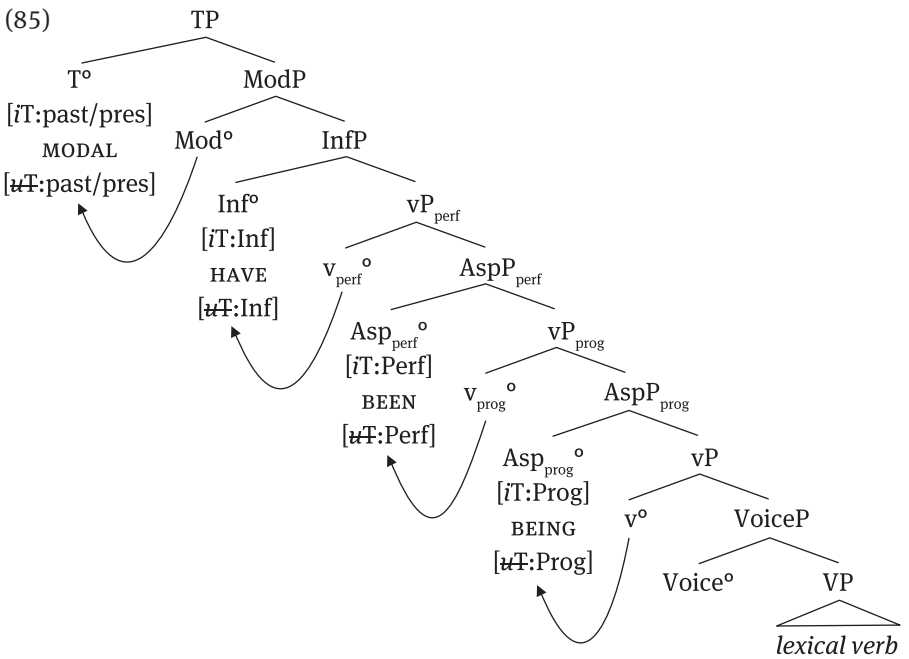
31 I assume that if the relevant matching interpretable feature occupies the same head as the auxiliary, then this is also within the auxiliary's c-command domain, and so is able to check the auxiliary's feature in this position.

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*T:Perf] feature, which must ultimately be checked against [*i*T: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. In all cases, 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 Agree and causing it to be spelled out in this position as *been*.

The case of non-finite *be* is similar, except that it is merged bearing an uninterpretable infinitival [*u*T:Inf] feature which must raise and check against the matching [*i*T: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*T:past/pres] feature which must be checked in T° against T's own [*i*T:past/pres] feature.

(85)



As the diagram above 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 discrete 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 and discussed in Sections 4 and 5. 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 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.[32]

In the following section I discuss five potential further issues. I first discuss the reliance of the system I have proposed on uninterpretable rather than valued features. I then explore an alternative to the raising approach, namely the direct insertion approach of Schütze (2003) and Cowper (2010). In Section 7.3 I discuss how the lexical verb might behave under the system I have proposed, and in Section 7.4 I discuss why there is no apparent distributional distinction between *be* and *been*. Finally, in Section 7.5 I discuss the cross-linguistic implications of the paper.

7 Further issues

7.1 Uninterpretable rather than unvalued

An issue which requires discussion for the approach just advocated is the reliance on uninterpretable features as opposed to purely 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 purely unvalued features under Bošković's approach: the auxiliary would be able to probe within its c-command domain 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 already valued but uninterpretable

32 If one wishes to claim, as per Dechaine (1995), Schütze (2003), Cowper (2010) and Bjorkman (2011) that auxiliaries are inserted post-syntactically for morphological reasons, then it is possible to argue, as per Roberts (1998), that the auxiliary raising detailed in this section may in fact be movement of pure abstract features, and that the auxiliaries themselves are only then inserted afterwards at PF.

features, they can only be checked by a matching inflectional feature situated higher, rather than lower, in the clausal hierarchy. For instance, suppose that a progressive auxiliary enters the derivation with its uninterpretable inflectional feature already valued for perfect morphology: [*u*T:Perf]. The only fully specified feature the auxiliary can be checked against in this instance is the [*i*T:Perf] feature located above it in the head of PerfP. This correctly predicts that the auxiliary will only be able to receive its inflection from a higher aspectual head rather than a lower one. However, if the same auxiliary were to enter the derivation unvalued: [*i*T:_], it would then be possible for such an auxiliary to be valued by the progressive [*i*T:Prog] or passive [*i*T:Pass] features below it, contrary to fact. This makes clear the need for already valued but uninterpretable features in this system.

The employment of uninterpretable features 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 (such as the Reverse Agree instantiation of affix lowering) 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.

In favour of feature checking, however, Lasnik (1995b) 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 already 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.[33] Yet Quirk et al. (1972), Sag (1976), Warner (1986), Lasnik (1995b) and Rouveret (2012) have all noted that inflectional mismatches are permitted between the antecedent of an ellipsis clause and the ellipsis clause itself, when the lexical verb is concerned: for instance in (86a) the tensed *ate* antecedes the ellipsis of infinitival *eat*, and in (86c), the infinitival form *eat* antecedes ellipsis of the participle *eaten*.

33 There is, however, much debate as to how strict the identity condition is, since sloppy identity readings of the type below, for instance, are possible in English VPE:

(i) *My sister saw herself in the mirror, and my brother did too.* = My brother saw her/himself.

It seems therefore that strict identity is not necessarily always so strict.

(86) 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 inflectional mismatches are permitted. The elided auxiliary must be identical to the antecedent:

(87) 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 (1995b) argues that this contrast between (86) and (87) supports his approach that auxiliaries enter the derivation already 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 (86) 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 (86b):

(88) First Ted T_{ense} **eat** a bunny burger, and now Robin has *-en* [~~**eat** . . .~~]

For auxiliaries, which enter the derivation already 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 (87c):

(89) *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 already inflected, enter the derivation bearing already 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 (87c):

(90) *Ted **be**[*u*T:**past**] eaten by a gorilla and Robin has ~~[**be**[*u*T:**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 (86b):

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

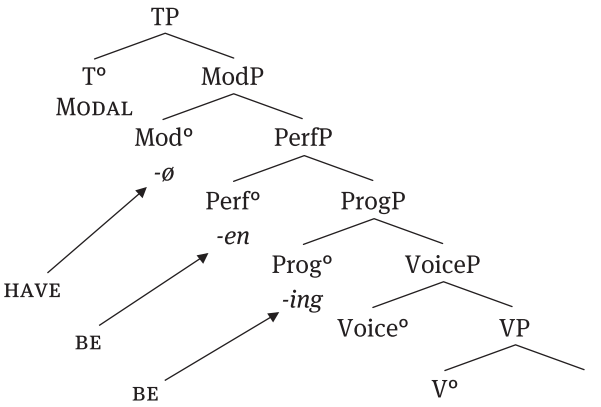
This suggests, as claimed earlier, that auxiliaries do indeed enter the derivation bearing already valued, but uninterpretable inflectional features rather than purely unvalued features. This seems to give some justification to the foot-driven movement account argued for in this paper which is dependent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

In the next sub-section I discuss an alternative to both auxiliary raising and affix lowering: auxiliary insertion. In particular I will highlight the shortcomings of this approach.

7.2 Alternative analysis: auxiliary insertion

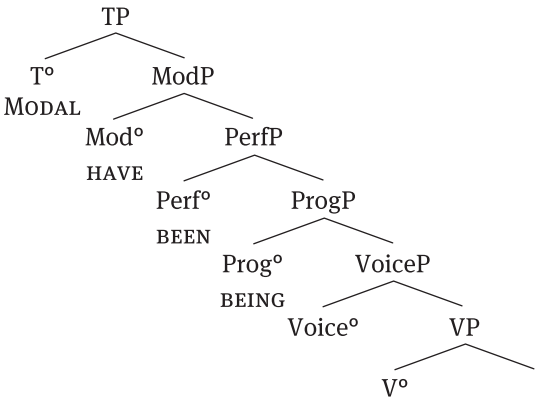
An alternative to both affix lowering and auxiliary raising has been proposed by Schütze (2003) and Cowper (2010), in which auxiliaries are inserted at PF directly into T° or Aspect° as a default means of hosting those inflectional affixes which could not attach to the lexical verb. Here I discuss Cowper's (2010) system since it is the most comprehensive. The diagram below illustrates the basic process of auxiliary insertion, though I maintain the labelling conventions established in this article rather than those offered in Cowper (2010) for ease of exposition.

(92)



The advantage to this system is that it allows for auxiliary distribution to be correctly determined by morphological form but without recourse to vP shells, one of the fundamental drawbacks of the auxiliary raising approach.

(93)



Despite these apparent advantages, the auxiliary insertion approach has a number of drawbacks of its own. The most obvious problem is the fact that under this approach there are three default auxiliaries at PF in English: *be*, *have* and *do*. In order to determine which auxiliary is selected, Cowper (2010) is forced into stipulating that auxiliary selection is determined by the complement of the stranded inflectional element that the auxiliary has been inserted to support. That is, *be* is inserted to support an inflectional element that has either a VoiceP or ProgP complement (or a DP, AdjP or PP complement in the case of copular constructions), whilst *have* is inserted to support an inflectional element

with a PerfP complement.[34] The problem here is that there is no relation between the stranded inflectional element and its complement, so it is unclear how the complement of the inflectional element can determine which auxiliary form should be inserted. This amounts to quite a stipulation.

With regards to *do*-support, the situation is more complex. Cowper (2010) claims that NegP is situated above TP and that in negated or SAI sentences T° raises to Neg° and C° respectively.[35] If a finite auxiliary is present, this would raise along with T°. However, if no auxiliaries are present, and there is only a lexical verb which remains in situ in V°/v°, then T° raises to Neg° or C° as an empty head. Cowper (2010) proposes that T° must be phonetically realised if it is not dominated by the TP it heads, therefore *do* is inserted whenever T° raises as an unfilled head.[36] Whilst this might correctly identify the environments in which *do*-support applies, the proposal is dependent upon the unprincipled requirement that T° must be phonetically realised whenever it is not dominated by the TP it heads. This is somewhat of a problem for the auxiliary insertion approach.

Thirdly, recall the distinction that was drawn in Section 7.1 between auxiliary verbs and lexical verbs. That is, auxiliary verbs can only be elided if they have an identical antecedent, whereas lexical verbs are not subject to such restrictions. This was argued to be on account of auxiliary verbs entering the derivation already inflected/valued, whilst lexical verbs enter the derivation bare/unvalued. The direct insertion approach, however, has no means of explaining this distinction since auxiliaries, similar to lexical verbs, are argued to enter the derivation bare.

Perhaps the most fundamental problem for the auxiliary insertion approach is the following auxiliary doubling data cited in Thoms and Walkden (2013):

(94) a. *[Willingly **been** examined by the committee]$_i$ he certainly has **been** t_i.*
b. *[Stupidly **be** punished for someone else's mistake]$_i$ he probably will **be** t_i.*
(Thoms and Walkden 2013:(37))

34 Once again, I stress that Cowper's (2010) hierarchy differs from that posited here in terms of labelling, and that I have translated Cowper's system to the hierarchy posited in this article for ease of exposition.

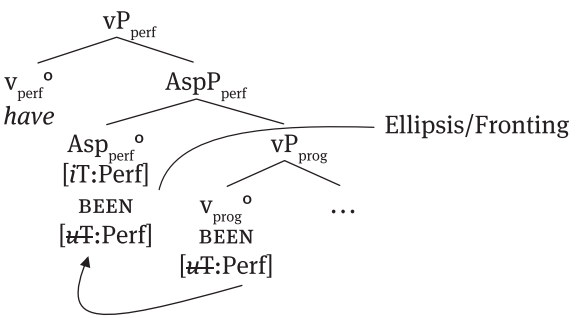
35 In order to have the subject preceding negation, Cowper (2010) claims that NegP inherits the EPP from TP.

36 In order to ensure that the lexical verb remains bare when *do*-support applies, Cowper (2010) claims that usually the finite lexical verb is valued in situ by T°, but that this relation is severed when T° raises to Neg° or C°. However, Cowper (2010) remains somewhat vague on exactly how this occurs, and the proposal amounts once again to a stipulation.

These data involve VPF, similar to the data discussed in Section 4.4. However, unlike the data in Section 4.4, in which the auxiliaries *be* and *been* were obligatorily stranded by the fronted constituent, the same auxiliaries in (94) have actually been included within the fronted constituent. Most interesting of all, however, is the fact that these auxiliaries are reduplicated in the non-preposed constituent. That is, when the auxiliaries *be* and *been* are fronted, a second copy of these auxiliaries is left stranded.

I analyse the fronting of *be* and *been* as being possible due to the presence of the stranded duplicate auxiliary. That is, I claim (as in Section 5.3) that the auxiliaries *be* and *been* are generated within the fronted constituent and raise out of it to check their inflectional features in Inf° and Perf° respectively. In accordance with the copy theory of movement, once the auxiliary has satisfied its inflectional feature in Inf° or Perf°, all lower copies within the movement chain will then be featurally satisfied as a result. This implies that a lower copy of the auxiliary would essentially be licensed.

(95)



Standardly it is the highest copy of a movement chain that is realised, but VPF appears to offer a context in which both higher and lower copies can be spelled out. The result is that the higher copy appears in the stranded position that is typical of *be* and *been*, whilst the lower copy is preposed with the rest of the fronted constituent, yielding the derivations in (94). Of course, why auxiliary doubling should only be permitted in these contexts in Standard English is a matter for further research, and is something which probably warrants an entire article of its own. The important point here, however, is the fact that the auxiliary *be*/*been* appears to occupy two discrete positions in the clause. In other words, the evidence suggests that the position in which *be/been* is merged is separate from the position in which it surfaces. This is a distinct problem for Schütze's (2003) and Cowper's (2010) auxiliary insertion approach, in which auxiliaries are

inserted directly into the positions in which they surface and are claimed not to undergo any movement.[37]

For these reasons I reject the direct insertion approach, despite its initially appealing advantages, and maintain that the auxiliary raising approach is still best suited for explaining the auxiliary pattern of English.

I next discuss how the lexical verb behaves under the approach I have advocated.

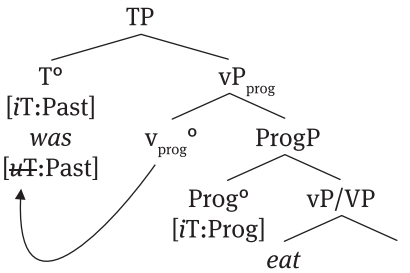
7.3 The lexical verb

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 does not raise beyond v°/V° in English (Pollock 1989), despite the fact that it can be fully inflected. Therefore, 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 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. In order to then explain the behaviour of the lexical verb, I propose to follow Lasnik's (1995b) and Baker's (2003) hybrid approach. Under this approach, the lexical verb in English, unlike auxiliary verbs, enters the derivation bare and without any kind of inflectional feature. Therefore it does not undergo raising. This means that an inflectional head in the clausal hierarchy, whether T° or an Aspect°, will never be filled and so is subsequently spelled out as a pure inflectional affix. The lexical verb and inflectional affix are then merged together via PF linear adjacency. I illustrate this in the examples below with progressive aspect and the lexical verb *eat*, as in 'X was eating':

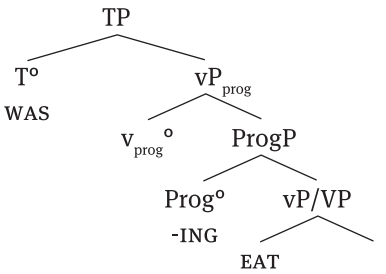
37 The data are problematic for the affix lowering analyses also (with the exception of Akmajian and Wasow [1975], Iwakura [1977], Akmajian et al. [1979] and Sailor [2012]) since these approaches typically assume that auxiliaries do not move and surface in the positions in which they are inserted/merged.

(96)



In this derivation, the finite auxiliary *was* raises from v_{prog}° to T° to check its inflectional feature. The lexical verb in v°/V° however, does not raise to Prog° for feature checking since the verb has no inflectional features to check. The inflectional head Prog°, being unfilled by any verbal element, is subsequently spelled out in accordance with the pure specifications of its own interpretable feature. In this case, the unfilled head of Prog° is spelled out as *-ing*:

(97)



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

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

the derivation is in danger of crashing. That is, 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 (1995b) and Baker (2003):

(99) Pinocchio was -ING + EAT = Pinocchio was eating.

This I claim to be the manner in which lexical verbs are inflected in English.[38,39]

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 the formalisation mentioned in this section 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.

The next issue to be explored is why no distributional distinction between *be* and *been* is apparent in the data.

7.4 *Be* vs. *been*

Admittedly, a problem for the auxiliary raising account is the fact that no distributional distinction can be observed between *be* and *been*. If auxiliary distribution was determined by morphological form, as the auxiliary raising account predicts, then one might expect a three-way distinction to be observed. That is, rather than there just being a distributional distinction between *be*/*been*

38 An anonymous reviewer asks why the stranded inflection could not alternatively attach to the preceding auxiliary. I standardly assume that auxiliaries in English are prosodically light in that they cannot host more than one affix. Since the preceding auxiliary is already inflected, the stranded inflection has no choice but to attach to the following verb.

39 There are two alternative approaches to the one just advocated. One is to claim, as per Chomsky (1993), that lexical verbs raise covertly in order to check their inflectional features rather than overtly. However, under this approach it is difficult to see how the distinction made between auxiliaries and lexical verbs in Section 7.1 could be maintained. See also Baker (2003) for arguments against such an approach.

The second option 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 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. However, it would be unclear why, under such an approach, the lexical verb in English should operate under Reverse Agree whilst auxiliaries operate under Standard Agree.

on the one hand, and *being* on the other, there should also be a distinction between *be* and *been*. The fact that this is not observed is potentially problematic. In all of the data reviewed in Section 4, there are no real instances in which *be* and *been* behave apart. Indeed, to my knowledge there are no phenomena yet observed in Standard English in which *be* behaves conclusively apart from *been*.

Does this therefore prove the auxiliary raising approach wrong? I answer that this lack of a distinction between *be* and *been* does not necessarily mean auxiliary raising is incorrect. Recall that in Section 5 I followed a number of authors in attributing the special behaviour of *being* to ellipsis, fronting and existential constructions uniquely privileging the landing site of *being*, i.e. the progressive aspectual layer. Going a step further, it was claimed that there is a division between progressive aspect and perfect aspect, with progressive aspect and all those projections below it constituting one discreet unit of structure, whilst perfect aspect, modals and tense constitute another. The difference between *be/been* on the one hand, and *being* on the other, was therefore explained on account of *be* and *been* sitting on one side of this divide, whilst *being* sits on the other.

Whilst further research is required, it seems to be the case that many linguistic phenomena which must privilege a constituent inside the main clausal spine in English will privilege the progressive aspectual layer and those projections below it, as this constitutes a discreet unit of structure. Since the modal and perfect aspectual layers, which *be* and *been* surface in respectively, both seem to occupy a single higher domain of structure, there is not likely to be any linguistic phenomena which will target one of these layers at the exclusion of the other. Therefore it is perhaps to be expected that there are no observed phenomena which can tease apart *be* and *been*.

Moreover, the distribution of the modal layer may be somewhat more complex than presented here. According to Cinque's (1999, 2004) functional hierarchy, modals, depending on the type, can be merged in a variety of positions. Modals of ability, obligation and permission, for instance, are argued to be merged below perfect aspect, whilst root and alethic modals are merged between perfect aspect and T°, and epistemic modals are merged either in T° itself, or above this position. This obviously may have repercussions for the location of InfP, the locus of infinitival inflections, and therefore, by extension, the distribution of *be*. If these claims are correct, then *be* may have a much wider distribution than argued for here, which would undoubtedly muddy the waters when trying to observe a distributional difference between *be* and *been*. I leave this as a matter for future research.

In the final sub-section, I discuss the cross-linguistic implications of this paper.

7.5 Cross-linguistic implications

This paper has aimed to establish that non-finite auxiliaries raise in English for inflectional purposes, akin to their finite forms. This begs the question however, of whether such non-finite verb raising is applicable cross-linguistically to languages which exhibit overt raising of the lexical verb. That is, there are many languages in which finite lexical verbs, similar to auxiliaries, overtly raise to T°. Do lexical verbs in such languages therefore undergo similar raising for the purposes of non-finite inflections as well? Since this paper claims that all verb raising is attributable to a general property of the verb seeking to satisfy its inflectional needs, we would predict that non-finite lexical verbs also undergo a similar form of raising in those languages which permit movement of the finite form. Though a thorough cross-linguistic study is beyond the scope of this paper, I illustrate here that this prediction is largely borne out in European Portuguese (EP).

EP has been argued to exhibit overt movement of the finite lexical verb out of vP for inflectional purposes (Raposo 1986; Ambar 1987, 1989; Galves 1994, 2001; Costa 1998, 2004; Modesto 2000; Brito 2001; Matos and Cyrino 2001; Costa and Galves 2002; Cyrino and Matos 2002; Ambar et al. 2004; Goldberg 2005; Cyrino 2013; Tescari 2013). This is evidenced by the fact that finite lexical verbs in EP undergo T to C Movement in *wh*-questions:

(100) *Quem* ***viu*** *o* *João?*
who saw the João?
'Who did João see?'
(Costa 2004:25)

Furthermore, the finite lexical verb must also precede low adverbs such as *completamente* 'completely', which I take to mark the left edge of vP:[40]

(101) a. **O* *João* *completamente* ***acabou*** *o* *seu* *trabalho.*
the João completely finished the his work.
'João completely finished his work.'
b. *O* *João* ***acabou*** *completamente* *o* *seu* *trabalho.*
the João finished completely the his work.
(Galves 2001:109)

40 Or at the very least, VP.

It transpires that this overt movement is not just restricted to the finite lexical verb. As the following data indicates, progressive participles must also raise beyond low adverbs:

(102) a. *O João completamente tinha estado **a ler** o livro.
the João completely had been reading the book
'João had been completely reading the book.'
b. *O João tinha completamente estado **a ler** o livro.
the João had completely been reading the book
c. *O João tinha estado completamente **a ler** o livro.
the João had been completely reading the book
d. O João tinha estado **a ler** completamente o livro.
the João had been reading completely the book
(Costa 2004:(69))

This suggests therefore that lexical verbs in EP, whether finite or non-finite, raise for inflections. This supports the hypothesis that if a verb raises for finite inflections, it will raise for non-finite inflections as well.

Furthermore, it can also be illustrated that non-finite lexical verbs in EP raise to different positions depending upon their inflection, parallel to the *be/been* vs. *being* contrast in English.

Similar to English (and unlike other romance languages), EP exhibits VPE (Raposo 1986; Matos and Cyrino 2001; Cyrino and Matos 2002, 2005; Goldberg 2005; Tescari 2013). Unlike English, however, the finite lexical verb survives VPE in EP by raising out of the ellipsis site. This leaves only the internal arguments to be elided:

(103) *Ela não leva o computador para as aulas, pois os amigos também não* ***levam*** *~~[o computador para as aulas]~~.*
she not brings the computer to the classes, because the friends too not **bring** the computer to the classes.
'Ana does not bring her computer to classes because her friends don't, either.'
(Cyrino and Matos 2005:(20))

Other than generally providing further support for the claim that finite lexical verbs in EP indeed raise for inflection, this brand of verb-stranding VPE can also be used to show that non-finite lexical verbs raise to different positions

depending upon their inflection. Cyrino and Matos (2002, 2005) note that lexical verbs inflected for progressive or passive morphology cannot escape VPE in EP:[41]

(104) *Ela está a ler livros às crianças mas ele não está*
she is to read books to the children but he not is
*(*__**a ler**__) [~~livros às crianças~~].*
to read books to the children.
'She is reading books to the children but he is not.'
(Cyrino and Matos 2005:(53))

(105) *O carro foi atribuído à Maria, mas os outros*
the car was given to the Maria, but the other
*prémios não foram (*__**atribuídos**__) [~~à Maria~~].*
prizes not were **given** to Maria.
'The car was given to Maria, but the other prizes were not.'
(Cyrino and Matos 2002:(29))

Interestingly however, lexical verbs inflected for perfect aspect can be stranded by ellipsis in EP:

(106) *Ela tem lido livros às crianças, mas ele também tem*
she has read books to the children, but he too has
*__**lido**__ [~~livros às crianças~~].*
read books to the children.
'She has read some books to the children, but he also has.'
(Cyrino and Matos 2005:(54))

This is parallel to the English data in which auxiliaries inflected for progressive aspect, i.e. *being*, are obligatorily elided under VPE, whilst auxiliaries inflected for perfect aspect, i.e. *been* can escape ellipsis.[42] This suggests therefore that non-finite lexical verbs do indeed raise to different positions in the clausal hierarchy dependent upon their inflection. That is, lexical verbs in EP which are in-

41 The sentences are permissible under an object drop interpretation. For instance, in (104) the second conjunct can mean *He is not reading anything*. This however, is a very different derivation from those involving ellipsis.

42 Parallel to *been*, the lexical verb in EP can also be optionally elided when inflected for perfect aspect. Once again, this optional ellipsis of such a verb can be accounted for by extending one of the various analyses that have been proposed to account for the optional ellipsis of *be* and *been* in English. See Akmajian et al. (1979), Thoms (2011, 2012), Sailor (2012), Aelbrecht and Harwood (2013), Harwood (2013, to appear) and Bošković (to appear).

flected for passive or progressive morphology do not raise high enough to escape ellipsis (which I assume for now targets the progressive aspectual layer in EP, parallel to English), whilst lexical verbs inflected for perfect morphology do raise high enough to escape ellipsis.

Of course, one could potentially maintain that verbs inflected for progressive aspect do not raise at all (parallel to the claim often made for *being* in English). But as the data in (102) from Costa (2004) showed, such a claim is untenable given that progressive participles in EP raise beyond low adverbs for inflectional purposes, parallel to their finite forms.

Note finally that lexical verbs in EP behave similar to English auxiliaries and dissimilar from English lexical verbs in that they require an identical antecedent in order to be elided:

(107) **O João* ***estudou*** *e a Maria também estava [****~~a estudar~~****].*
the João **studied** and the Maria also was **to study**.
'João studied and Mary was, too.'
(Cyrino and Matos 2005:(34))

This provides further support that verbs which undergo raising enter the derivation already inflected/valued, and must raise in order to satisfy their unchecked inflectional feature, as I argued to be the case with auxiliary verbs in English.

To summarise, this sub-section offers further evidence in favour of the claim that verbs, whether finite or non-finite, can raise for inflectional purposes, and that this can apply equally to both lexical verbs and auxiliary verbs.

This concludes discussion of the further issues. In the final section, I summarise and conclude this paper.

8 Summary and conclusion

This paper has addressed the issue of whether English non-finite auxiliaries raise to receive their inflections, or have such 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 entirely by auxiliary type, whereas the auxiliary raising accounts predict that auxiliary distribution should be influenced by morphological form.

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 (1995b) 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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Note: The judgments expressed in this paper are based on the intuitions of a number of native speakers of British English, including those of the author, unless otherwise indicated.