

The movement of licensing heads and the timing of ellipsis

This paper investigates the interaction of head movement and ellipsis licensing. I show that the apparent movement of ellipsis-licensing heads does not extend the domain of ellipsis at LF or PF, an issue that has largely gone unobserved and remains to be addressed in current theories of ellipsis licensing. I argue that adopting a non-movement analysis of head movement avoids the problem on the traditional view that ellipsis is essentially an interface phenomenon triggered by licensing heads. With the basic argument outlined, I then discuss what happens if we assume that ellipsis occurs during the narrow-syntactic derivation and whether it can provide a better account of the facts introduced earlier. I argue that effects similar to those discussed before may still arise under this view and that blocking them requires stipulating an order of operations imposed by ellipsis licensing heads.

KEYWORDS: ellipsis, head movement, ellipsis licensing, derivational timing

1 Introduction

The relative timing of head movement and ellipsis has received extensive discussion in the recent theoretical literature (see, among others, Boeckx and Stjepanović 2001, Gribanova 2017, Gribanova and Mikkelsen 2018, Hartman 2011, Holmberg 2001, Landau 2018b, Sailor 2018, Schoorlemmer and Temmerman 2012). The mainstream approach to ellipsis proposes that ellipsis is licensed by heads that trigger ellipsis of their complements in the PF component of the grammar. If head movement is not a (narrow) syntactic operation, as Chomsky (2001) suggests, head movement may itself occur in the PF component as well. A central question, then, is whether each of these phenomena can shed light on the timing of the other.

Much of the discussion on the relation between ellipsis and head movement focuses on the nature of verb-stranding ellipses (Goldberg 2005, Gribanova 2013, 2017, Manetta 2018, McCloskey 2017, Sailor 2018, Schoorlemmer and Temmerman 2012). In these sorts of constructions, verbs appear to be stranded outside of an ellipsis site. The standard view is that the verb undergoes head movement to a position outside of a verb phrase or TP that is targeted for ellipsis. The relative timing of head movement and ellipsis is therefore relevant to the theoretical understanding of phenomena like verb-stranding ellipses: If ellipsis precedes head movement, then ellipsis might bleed verb stranding (in the sense of Kiparsky 1968).

In this paper, I focus on a different issue, namely what happens when the heads that apparently license ellipsis undergo movement. On the mainstream view of ellipsis, functional heads license the ellipsis of their complements. These heads, however, are often subject to head movement. Given that these heads are responsible for imposing ellipsis-specific requirements on their complements at both the LF and PF interfaces (Merchant 2001), the prediction is that head movement should alter both the PF target of ellipsis and the LF scope of the identity requirement if head movement occurs in the narrow syntax. I show in this paper that this prediction is not borne out. The generalization is that ellipsis licensing and identity behave as though the licensing heads never move from their base positions; that is, they cannot license

the ellipsis of their complements in the positions to which they move, and they can only license ellipsis of their complements in the position from which they move. This is easiest to see in standard approaches to ellipsis where heads license the ellipsis of their complements, but I show this extends to derivational approaches to ellipsis (specifically Aelbrecht 2010) where ellipsis is triggered earlier in the derivation, having effects before Spell Out.

The above generalization receives a straightforward explanation if the phenomenon of head movement is not effected by standard narrow-syntactic movement operations (such as Move or Internal Merge). I propose adopting a non-movement approach to head movement phenomena. This allows ellipsis-licensing heads to remain *in situ* at the interfaces while the morpho-phonological features associated with those heads are pronounced in other positions. This explains why head “movement” does not affect the scope of the [E]-feature, regardless of when ellipsis is taken to occur.

This paper follows LaCara (2016) in attempting to identify potential syntactic effects of head movement, and to that end steps back from the question of whether head movement has any semantic effects. However, the data in this paper pose a challenge to proposals that justify narrow-syntactic head movement on the basis of its ability to change (quantifier) scope relations. For instance, it has been argued by Lechner (2007) that moving modals affects quantifier scope. The problem is that this justification predicts that moving other heads that induce interface phenomena (like ellipsis-licensing heads) should extend the domain of these heads as well. I argue this is not borne out. I will not attempt to resolve this conflict in this paper, since my narrow focus here is to explore the interaction between head movement and ellipsis licensing.

1.1 Roadmap

This paper is organized as follows. In Section 2, I review the standard head–complement approach to ellipsis licensing, focusing on the assumptions that I will adopt for the rest of the paper. In Section 3, I show that moving heads that license ellipsis does not effect the size of an ellipsis site, which is predicted by narrow-syntactic approaches to head movement. In Section 4, I show that non-movement approaches capture this data straightforwardly while attempting to reconstruct the licensing head fails under a narrow-syntactic approach. In Section 5, I will discuss how this problem manifests under the derivational account of Aelbrecht (2010). In Section 6, I will offer some concluding remarks.

2 Ellipsis licensing and the [E]-feature

In this section, I outline my assumptions about ellipsis licensing. I describe what amounts to a fairly standard picture of ellipsis licensing: Following Merchant (2001), *et seq.*, I will assume that ellipsis is licensed by a functional head bearing an [E]-feature. In the following section I go on to show how this assumption predicts that narrow-syntactic movement of heads predicts that ellipsis domains should be extensible by head movement.

2.1 Background on the head-licensing theory of ellipsis

The mainstream view of ellipsis is that it is licensed by a functional head that compels the non-pronunciation of its complement at PF (Chao 1987, Johnson 2001, Lobeck 1995, Merchant 2001, 2004, 2013, Zagana 1988; see also Akmajian and Wasow 1975, Sag 1976 for antecedents under older theoretical assumptions). As I'll discuss below, it seems that the complements of auxiliaries, modals, and potentially negation (Potsdam 1997) may all be the targets of vPE. Depending on one's theoretical assumptions, T^0 , Aux^0 , or Asp^0 (the heads traditionally comprised by Infl) as well as Σ^0/Neg^0 , ν^0 , or $Voice^0$ may license the ellipsis of their complements.¹

The head-licensing theory of ellipsis finds support in the observation that the complement of specific heads may be the target of ellipsis regardless of its category. It is these heads that delimit the domain of ellipsis. This can be seen in the phenomenon of predicate ellipsis. The complement of the copular *be* may be elided under identity with some antecedent regardless of the syntactic category of that complement (Sag 1976):

- (1) a. Malcolm is tall, and Sadler also is Δ_{AP} .
- b. Gennaro was not a professor, but Grant is Δ_{DP} .
- c. Timmy should be in this class, and Lex should be Δ_{PP} too.

The ability of predicate APs, DPs, and PPs to undergo ellipsis can be seen as a generalization over the element that takes them as complements. Thus, predicate ellipsis as in (1) might be more accurately described as complement-of-*be* ellipsis.

The head-licensing approach also finds support in the observation that ellipsis are not able to target arbitrary syntactic positions. As Lobeck (1995: 48) observes, verb phrase ellipsis cannot target the complement of a (main) verb:

- (2) a. *Because Mary continued Δ_{VP} , John started speaking French.
- b. *Fire began pouring out of the building, and then smoke began Δ_{VP} .

If vPE could elide verb phrases wherever they might occur, the fact that vPE in (2) is impossible would be left unexplained. This observation can be extended to the examples in (3): APs, DPs, and PPs cannot be targeted for ellipsis when they are not complements to copular *be*; compare (1).

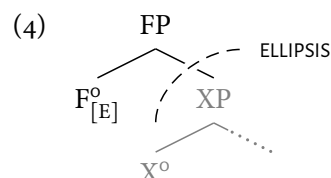
- (3) a. *Malcolm seems tall, and Sadler also seems Δ_{AP} .
- b. *Gennaro did not become a professor, but Grant became Δ_{DP} .
- c. *Timmy put a raptor in the freezer, and Lex put one Δ_{PP} too.

The general conclusion, therefore, has been to assume that certain syntactic heads may license the ellipsis of their complements. This allows the licensing conditions on ellipsis to be stated over positions (in terms of 'complement of head X^0 ') and explain why certain phrases matching the category of other elided constituents cannot be targeted for ellipsis.

¹ Being in the local domain of T^0 seems to play a special role in licensing ellipsis (Aelbrecht 2010, Lobeck 1995). I'll discuss this a bit more in Section 5.1.

2.2 Ellipsis licensing in a Merchant-based theory

The standard approach to ellipsis under Minimalist assumptions, following Merchant (2001, 2004, 2013), is to assume that the licensing conditions are not imposed by the functional head itself but by a feature $[E]$ which is hosted by the licensing head, as sketched in (4). Below I will outline the central properties of this approach that will be critical in the coming discussion and which I will assume up to Section 5.



The $[E]$ -feature does two things, each at a different interface: (i) It imposes the **IDENTITY REQUIREMENT** over material in its complement at LF and, if the identity requirement is met, (ii) $[E]$ **LICENSES** ellipsis of the material in its complement at PF. The general view of the identity requirement is that the material in the ellipsis site must match some antecedent for ellipsis to be possible. This requirement is generally thought to be either structural, holding over matching LFs, or semantic, holding over equivalent denotations.²

On the PF side, the $[E]$ -feature sends an instruction to PF that the material in its complement must not be pronounced. This has historically been called the PF-deletion approach, but a plausible (and arguably superior) alternative to deletion is that ellipsis blocks lexical insertion in the post-syntactic component of the grammar rather than deleting material that is already there (Harley 2007, Saab 2008). Regardless of the precise implementation, the standard idea is that this process happens after the structure is sent to PF.³

Finally, there is a broad assumption that the distribution of $[E]$ -features is lexically or categorically constrained. As noted above, only certain heads are able to license the ellipsis of their complements, and this is modeled as a selectional or featural restriction on $[E]$ itself. For instance, Merchant (2004) assumes that $[E]$ -feature that licenses sluicing bears the features $[uwh^*, uQ^*]$, ensuring that it will only ever occur on the null C^0 that introduces constituent questions in English. The $[E]$ -features that license **VPE** and **NPE** will, in turn, bear features that ensure that they only occur on the heads that license these phenomena. Since the $[E]$ -feature is a lexical item, this explains why some languages lack certain ellipsis phenomena; languages that lack **VPE** (like French and German) lack the $[E]$ -feature that licenses **VPE**.

The key takeaway is that the $[E]$ -feature is associated with specific syntactic heads and is responsible for imposing the identity condition at LF and deleting material in its complement

- 2 The precise notion of identity in ellipsis will not play an active role in the coming discussion. What will matter is the amount of material over which this relation is construed. Even on semantic approaches to ellipsis identity utilizing the $[E]$ -feature, the identity condition is only construed to hold over the denotation of the material in the complement of the head bearing the $[E]$ -feature.
- 3 As I discuss in Section 5 Aelbrecht's (2010) derivational approach to ellipsis and phase-based approaches like those presented by Bošković (2014) and Rouveret (2012) posit that ellipsis is triggered during the course of the derivation. This means that the elided constituent is sent to the interfaces with an added instruction to PF that the constituent should not be pronounced. This difference in timing does not change the assumption that non-pronunciation is a PF effect (see Aelbrecht 2010: 105 and Bošković 2014: 45).

at PF. This makes a prediction that moving a head bearing the $[E]$ -feature should be able to extend the domain over which the effects of ellipsis apply since the effects of the $[E]$ -feature are fundamentally interface effects. I turn to the question in the following section.

3 Moved heads do not license ellipsis in their landing position

In this section, I present evidence that licensing heads that undergo head movement do not license ellipsis in the position to which they move (the LANDING POSITION). If such heads were able license ellipsis of the complement of their landing positions, more material would be elided than is actually observed. Rather, the generalization is that ellipsis-licensing heads only license the ellipsis of the complement of the position *from which* they move (their BASE POSITION). We can see this by looking for material in the position of α in (5), between the base position (F^0) and the landing position (X^0):

$$(5) \quad [X^0 + \dots + F^0_{[E]} \underbrace{[YP \dots \alpha \dots [FP \ F^0_{[E]} [ZP \dots]]}_{\text{Target}}]$$

Impossible ellipsis target

The evidence in this section comes from three domains:

- i. Subject–auxiliary inversion in English
- ii. Auxiliary movement past negation in English
- iii. Polarity focus in Russian

In all these cases an a head that licenses ellipsis undergoes movement to a higher position. This element licenses ellipsis in the position from which it moves, but fails to do so in the position to which it moves. Furthermore, it can be seen that the $[E]$ -feature must be interpreted in its base position at LF and not in the position to which the head that bears it overtly moves. Thus, there is evidence that ellipsis-licensing heads are interpreted *in situ* at both PF and LF.

3.1 Subject–auxiliary inversion and movement to C^0

In this subsection, I discuss subject–auxiliary inversion, or SAI, in English. SAI occurs when an auxiliary in T^0 moves to C^0 , crossing over the subject in SpecTP. This can be fed by movement of auxiliaries to T^0 (which I discuss in more detail in Section 3.2). Assuming that T^0 (and the elements in it) can bear an $[E]$ feature, moving an auxiliary verb to C^0 should extend the domain of ellipsis to encompass the entire TP. Following the schematic in (5), SAI should therefore allow for the ellipsis of material in SpecTP; as I show below, this is unattested. Instead, ellipsis still targets the verb phrase despite the fact the licensing head has moved away.

$$(6) \quad [_{CP} \text{Aux}^0_{[E]} + T^0 + C^0 \underbrace{[_{TP} \dots \text{SUBJ} \dots [_{\text{AuxP}} \text{Aux}^0_{[E]} [_{vP} \dots]]}_{\text{Target}}]$$

Impossible ellipsis target

Subject–auxiliary inversion is clearly visible in English root questions, where modals, non-modal auxiliaries, and even negation appear before the subject:

- (7) a. [CP Can [TP Sara ____ [vP touch her toes]]]?
 ↑
 b. [CP Is [TP Bill ____ [vP going to buy that puppy]]]?
 ↑
 c. [CP Has [TP Bill ____ [vP done his best]]]?
 ↑
 d. [CP Wouldn't [TP Bill ____ [vP take out the trash]]]?
 ↑

These elements permit the ellipsis of their complements *in situ*:

- (8) a. Can anybody here touch their toes? – Sara can Δ!
 b. I heard somebody is going to buy that puppy. – Yeah, Bill is Δ.
 c. I know I've done my best, and Bill has Δ, too.
 d. Sally took out the trash because Bill wouldn't Δ.

If these heads could license ellipsis of their complements in C°, we would expect it to be possible to elide subjects if the subject of the antecedent matched (either lexically or by having the same referent). This is not possible with any kind of auxiliary, including modals (9), progressive *be* (10), and perfective *have* (11), nor is it possible for negation (12). In the notation here, '...*(X) Δ ...' means that the example is ungrammatical if the element X is included in the ellipsis site.

- (9) A: Sara can touch her toes!
 B: Really? Can *(she) Δ?
 (10) A: Is Bill going to buy that puppy?
 B: I don't know. Is *(he) Δ?
 (11) Whenever Bill says he's done his best, I have to ask myself: Has *(he) Δ?
 (12) A: Mary thought Bill wouldn't take out the trash.
 B: Wouldn't *(he) Δ if we asked him?

The effect can also be seen in a somewhat more natural setting in English tag questions.⁴

- (13) Sara can't touch her toes, can *(she) Δ?
 (14) Bill isn't going to buy that puppy, is *(he) Δ?
 (15) Bill's done his best, hasn't *(he) Δ?

⁴ Thanks to Craig Sailor for suggesting using tag questions.

- (16) Bill would take the trash out if we asked him, wouldn't *(he) Δ ?

Using root polar questions and tag questions avoids a potential confound introduced by MaxElide effects (Hartman 2011, Merchant 2008, Messick and Thoms 2016, Schuyler 2001, Takahashi and Fox 2005).⁵ When there is *wh*-movement out of an ellipsis site, it is often required that clausal ellipsis (*i.e.*, sluicing) be used instead of *vPE*:

- (17) Mary was kissing somebody, but I don't know who (*(she was) Δ .

However, it is well-known that sluicing does not permit any material to be pronounced in C^0 , a point that has been codified as Merchant's (2001) Sluicing-COMP Generalization:

- (18) *Sluicing-COMP Generalization* (Merchant 2001: 62):
No non-operator material may appear in COMP.

Thus, *wh*-movement out of an ellipsis site can induce MaxElide effects, compelling sluicing instead of *vPE*, thereby blocking T^0 -to- C^0 movement. Therefore, we have to be careful about the examples we choose, since certain instances of *wh*-movement out of ellipsis sites will require that T^0 -to- C^0 movement not occur. Pronouncing an auxiliary in C^0 is therefore independently predicted to be ungrammatical in many of the kinds of cases we care about; for instance, we cannot tell whether example (19) is bad because of a Sluicing-COMP violation or because auxiliaries cannot license ellipsis of TP.

- (19) Mary scammed somebody. The question is: Who (*(has) Δ ?

Fortunately, MaxElide effects can be circumvented if the would-be sluicing site contains material that contrasts with material in the antecedent.⁶ This allows us to see that moving an auxiliary to C^0 does not extend the ellipsis domain in *wh*-questions, either. Contrasting auxiliaries, adverbs, or polarity elements located between the *wh*-element and *vP* effectively block sluicing from occurring since they make the antecedent TP distinct from the TP that would be deleted for the purposes of ellipsis identity. This renders *vPE* the only viable option for ellipsis, and the ability to do T^0 -to- C^0 movement is restored. The result is, nonetheless, ungrammatical:⁷

- (20) TRUMP: What has Cohen told you?
MUELLER: What HASN'T *(he) Δ ?

In sum, moving an auxiliary that licenses ellipsis to C^0 does not allow for the ellipsis of TP. Before moving on, though, there is one other property of these examples I wish to call attention to: In every case, despite the fact that the licensing head appears in C^0 on the surface and is no longer adjacent to the verb phrase, *vPE* is still possible, making it appear

⁵ I make no commitment as to whether MaxElide is an independent constraint on the grammar or can be explained by a more general appeal to issues such as parallelism (Messick and Thoms 2016). I use the term 'MaxElide effects' to be neutral here.

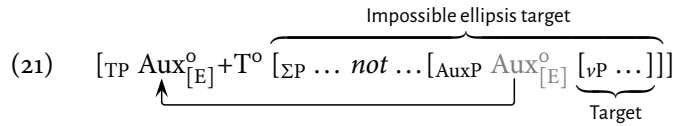
⁶ This is a bit of an oversimplification; see Messick and Thoms 2016 for more details.

⁷ I am assuming that the Verbal Identity Constraint is not at play here; see Gribanova 2013, Landau 2018b.

as though the licensing elides the verb phrase *at a distance* (see Lobeck 1995: 151–154). Not only does head movement not extend the domain of ellipsis at PF, it has no apparent effect on the ability to delete νP . This is not predicted on the view that a head (or a head bearing the $[E]$ -feature) licenses deletion of its complement at PF. As I discuss below, this is a recurring property of moved licensing heads.

3.2 Auxiliary movement to T^0

The same effect seen in T^0 -to- C^0 movement can be observed in auxiliary movement past negation: An ellipsis-licensing head cannot license the ellipsis of negation when it moves to T^0 .



The typical view, sketched in (22a) is that non-modal auxiliaries like *have* and *be* originate in a position below negation (Chomsky 1957), but that the highest auxiliary moves to T^0 when no other head intervenes, as in (22b). I assume, following, *e.g.*, Pollock (1989), that *not* is not a head in the clausal spine but rather an adverbial introduced by a polarity head (notated here as Σ^0 , following Laka 1990) and that this is why it does not undergo head movement.

- (22) a. $[_{TP} \text{They should } [\Sigma P \text{not } \Sigma^0 [_{AuxP} \text{have } [_{\nu P} \text{kissed that pig}]]]]$.
 b. $[_{TP} \text{They have} + \Sigma^0 + T^0 [_{\Sigma P} \text{not } \underline{\quad} [_{AuxP} \underline{\quad} [_{\nu P} \text{kissed that pig}]]]]$.
-

Critically, these lower auxiliaries appear to be able to license the ellipsis of their complements *in situ*:

- (23) They kissed that pig, but they should not have Δ .

Assuming the $[E]$ -feature sits on the auxiliary *have*, one might therefore expect the auxiliary to carry the $[E]$ -feature with it when it moves. Even when this movement occurs only νP is a valid target for ellipsis, not ΣP . Despite the fact that ΣP is the complement of T^0 as shown in (24) and (25), negation cannot be understood as part of the elided material even when it is included in the antecedent clause.

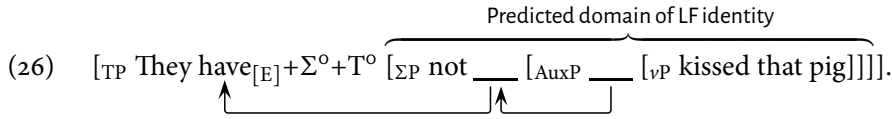
- (24) They said they had $[\Sigma P \text{not } [_{\nu P} \text{kissed that pig}]]$, and they have Δ .

- a. $\Delta = [_{\nu P} \text{kissed that pig}]$
 b. $\Delta \neq [\Sigma P \text{not kissed that pig}]$

- (25) We heard Bill was $[\Sigma P \text{not } [_{\nu P} \text{taking out the garbage}]]$, and he is Δ .

- a. $\Delta = [_{\nu P} \text{taking out the garbage}]$
 b. $\Delta \neq [\Sigma P \text{not taking out the garbage}]$

Notice that the missing interpretations in (24b) and (25b) are precisely those that are predicted to exist if the identity requirement on ellipsis were calculated over the complement of T^0 , the position to which the $[E]$ -feature ought to have moved:



Negation is part of the antecedent clause in both (24) and (25), and so the identity condition on ellipsis should be met in these cases. Yet, the only interpretation we get in the elliptical clause is one where there is no negation only νP has been deleted. Thus, only the νP seems to be a valid antecedent. Although the licensing head appears in T^0 , the missing interpretations in (24b) and (25b) are evidence that the $[E]$ -feature is not interpreted in this position at LF.

This does, however, raise a question about modal auxiliaries, which are often assumed to originate in T^0 rather than move there like other auxiliaries. Modals are commonly taken to bear the $[E]$ -feature, as they apparently elide their complements in the absence of other auxiliaries, as discussed in the previous subsection. However, like other auxiliaries, they do not license ellipsis of negation, either.

(27) They said they would $[_{\Sigma P} \text{ not } [_{\nu P} \text{ speak to the professor}]]$, and I think that they should Δ .

- a. $\Delta = [_{\nu P} \text{ speak to the professor}]$
- b. $\Delta \neq [_{\Sigma P} \text{ not speak to the professor}]$

On the analysis presented here, this is consistent with modals originating in a lower position and moving to T^0 (see, e.g., Harwood 2013: 35–36, Roberts 1998: 115). As far as I can tell, as long as T^0 attracts the nearest c-commanded head (already assumed for non-modal auxiliaries) and modals c-command all other auxiliaries (already assumed under the hypothesis that they merge in T^0), this has no immediate consequences for the rest of our clausal syntax.

3.3 Russian polarity focus

Gribanova (2017) discusses polarity focus constructions in Russian where a verb is used to either confirm or deny a previous utterance. When this happens, the verb appears without the subject following it:

(28) *Russian* (based on Gribanova 2017: 1107):

- a. Maša včera otpravila piš'mo v Moskvu, i telegrammu v Piter?
Masha yesterday send.PST.SG.F letter to Moscow and telegram to Piter
'Did Masha send a letter to Moscow, and a telegram to St. Petersburg yesterday?'

- b. (Da), otpravila (*ona) Δ.
yes send.PST.SG.F she
'Yes, she did.'
- c. (Net), ne otpravila (*ona) Δ.
no NEG send.PST.SG.F she
'No, she didn't.'

On her analysis (simplified here to emphasize the relevant parts), utterances like (28b) and (28c) involve movement of a verb to a Pol(arity)^o head external to TP and subsequent clausal ellipsis. However, in contrast to the English SAI data in (9)–(12), the subjects in (28b) and (28c) are elided:

$$(29) \quad [\text{Pol}^o + \text{V}^o \overbrace{[\text{TP SUBJ} \dots [\text{VP V}^o_{[\text{E}}]]}]^{\text{Ellipsis target}}]$$

The question here is what element licenses the ellipsis. One might reasonably conclude, as Gribanova (2017) does, that Pol^o bears an [E]-feature that licenses ellipsis of its complement. But, as Vera Gribanova (p.c., 5 Jan. 2018) has pointed out to me, since Russian allows verb-stranding ellipsis more generally, it is possible that the [E]-feature used to license vPE elsewhere moves with the verb to Pol^o. On this view, the [E]-feature would instead be part of the verbal complex and would be responsible for clausal ellipsis in (28) when it moves to Pol^o.

I argue, however, that Gribanova's (p.c.) suggestion cannot capture the full range of polarity focus data, as subjects can appear under specific circumstances. Gribanova shows that an adverb adjoined between VP and TP in the ellipsis clause permits the subject to appear. In (30b), this adverb is *medlenno* 'slowly'.

(30) *Russian* (Gribanova 2017: 1114):

- a. Ona pišet pišmo komitetu i otvet na recenziju v žurnal?
she write.PRES.3SG letter committee.DAT and answer to review to journal
'Is she writing the letter to the committee and the response to the review to the journal?'
- b. Pišet ona medlenno Δ (...a drugoj mog by pobystree).
write.PRES.3SG she slowly but another could SUBJ faster
'She's writing (them) slowly (while someone else might have done it faster).'

The adverb in (30b) introduces a contrast between the ellipsis clause and the antecedent clause such that the identity condition that must hold between the two TPs cannot be satisfied. Consequently, clausal ellipsis becomes impossible, but vPE is apparently allowed. Gribanova (2017) proposes that the contrast between (28) and (30) are the result of MaxElide effects.⁸

This is another apparent case of licensing at a distance, as discussed at the end of Section 3.1. In (30b), a main verb moves to Pol^o. Assuming the Head Movement Constraint requires

⁸ Gribanova (2017) assumes, following Hartman (2011), that head movement can induce MaxElide effects, and for Hartman this requires head movement to leave traces. On the account of head movement I argue for here, head movement does not leave traces, so if my argument is right the fact that TPs must normally be elided under polarity ellipsis (as opposed to vPs) requires a different explanation.

the verb to move through every head position on its way to Pol^0 (Travis 1984), the verb must move through the head bearing the $[\text{E}]$ -feature; Gribanova (2013) argues this is Asp^0 . The licensing head thereby moves to Pol^0 , but νP remains the target of ellipsis despite not being adjacent to the licensing head at PF. Furthermore, the identity condition is necessarily construed over νP and not over TP, since we know that the two TPs do not match for the purposes of identity. This means that in (30b), the $[\text{E}]$ -feature cannot be interpreted in Pol^0 at LF. In sum, despite the fact the licensing head has apparently moved to Pol^0 , ellipsis behaves like it is in its base position.

3.4 Summary

The key generalization from the discussion in this section is that an ellipsis-licensing head can only license the ellipsis of its complement in the position from which it moves; it cannot license the ellipsis of the position to which it moves. I have shown this holds both for T^0 -to- C^0 movement and Aux^0 -to- T^0 movement in English; additionally, I have shown that it is necessary for the νP -ellipsis-licensing head in Russian to be interpreted in its base position in Russian polarity focus constructions. Despite the observation that on the surface licensing heads appear to have moved, ellipsis behaves as though licensing heads have not moved.

The question we turn to now is how to account for this generalization. The facts above are compatible with the hypothesis that ellipsis must derivationally precede head movement; that is, given that an ellipsis-licensing head licenses the ellipsis of its complement and only does so in its base position, ellipsis must occur before that licensing head moves away from its base position. I will pursue such an analysis in the following section.

4 Licensing heads do not move

In this section I present an analysis of the facts discussed above: (i) Head movement does not increase the amount of material that is elided at PF; (ii) ellipsis may occur at a distance from an apparently moved licensing head, and (iii) head movement does not change the scope of the identity requirement at LF. I propose that the reason for this is that heads do not actually undergo syntactic movement. Consequently, ellipsis-licensing heads remain *in situ* at both PF and LF, explaining why apparent movement of these elements has no PF or LF effects.

To my knowledge, points (i) and (iii) have not been previously observed in the literature, but point (ii) has. The observation dates back to at least Akmajian and Wasow 1975 and Sag 1976: 34–35, though under very different theoretical assumptions. As mentioned in Section 3.1, Lobeck (1995: 151–154) is aware of (ii) and claims, given her argument that ellipsis sites must be properly head-governed, that the licensing head may govern the ellipsis site through its trace via Baker's (1988) Government Transparency Corollary. This allows νP ellipsis to occur when an auxiliary has moved to C^0 .

Modern approaches to ellipsis do not, to my knowledge, explicitly account for (i)–(iii). Merchant (2001), under Minimalist assumptions, explicitly rejects Government and, therefore, the Government Transparency Corollary. He proposes the $[\text{E}]$ -feature (discussed in Section 2.2) as an update to Lobeck's Government-based approach. However, Merchant does not

address the possibility that heads bearing the [E]-feature may undergo movement.⁹ Despite the fact that the head bearing the [E]-feature ostensibly moves, VPE remains available.

On approaches following Merchant's analysis, the observation that ellipsis behaves as though the licensing head does not move is puzzling if we assume that licensing heads undergo movement in the narrow syntax. On the standard view that a head licenses the ellipsis of its complement, ellipsis happens at PF, and identity is calculated at LF/Semantics. Since narrow syntactic movement would feed both of these interfaces, we should expect to find cases where movement of licensing heads changes the amount of material targeted by ellipsis, and the domain over which ellipsis identity is calculated. I argued in the previous section that neither prediction holds; that is, head movement has no PF effect on ellipsis domains,¹⁰ and it does not affect the scope of the identity requirement. If we make the assumption that head movement is not derived by narrow syntactic movement, these facts fall out straightforwardly.

4.1 Head movement as Conflation

There have been many recent proposals head movement is not derived by the same theoretical mechanisms that derive phrasal movement, and as a result many authors have proposed novel mechanisms that derive the effects of head movement by other means. Harley (2004, 2013), following Hale and Keyser (2002), proposes that adjacent heads are subject to the syntactic operation Conflation, which passes morphophonological features from the head of a phrase to the next immediately c-commanding head. Svenonius (2012) proposes that Spell-Out recognizes spans of adjacent heads and that a single morphological exponent may spell out a span. Platzack (2013) instead posits that features may be shared between adjacent heads via Agree. Harizanov and Gribanova (2018) propose that categories are specified for morphological features that cause them to undergo either post-syntactic raising or lowering in the morphological component as part of word formation.¹¹ What unites these approaches is the idea that morpho(-phono)logical features originating on individual heads come to be associated with other heads without resorting to the mechanisms that derive narrow syntactic movement (effected variously by operations such as Copy, Move, or Internal Merge). On the strongest possible formulation, head-to-head *movement*, *per se*, does not exist.

In my analysis below, I adopt CONFLATION as developed by Harley (2004, 2013). I do so largely for concreteness;¹² other non-movement approaches to head movement should work equally well since the only critical assumption for my argument is the proposal that heads themselves remain *in situ* at all points of the syntactic derivation.¹³

⁹ There are a few probable reasons for this, foremost of which is that Merchant's (2001, 2004) main preoccupation is with clausal ellipsis where these issues do not actually arise.

¹⁰ This is not to say that head movement cannot satisfy other independent requirements on ellipsis. For instance, if ellipsis requires licensing heads to be overt phonologically (Conner 2015), head movement may provide a way of fulfilling that requirement in some contexts.

¹¹ Harizanov and Gribanova (2018) also allow for a distinct form of narrow-syntactic head movement; I won't address their arguments for this here.

¹² This is the approach I adopt in LaCara 2016 as well. In that paper, I argue for a non-movement approach to verb movement on completely independent grounds, unrelated to ellipsis.

¹³ That is not to say that these proposals are interchangeable for all phenomena. For instance, Harizanov and

Under Conflation, morphologically complex elements are not formed by Move or its successors. The syntax underlying a structure containing an element that appears to be derived by the adjunction of multiple syntactic heads does not actually involve movement of those heads. For instance, a complex head with a PF surface form $Z+Y+X$ must have an underlying syntax $[_{XP} \dots X^{\circ} [_{YP} \dots Y^{\circ} [_{ZP} \dots Z^{\circ} \dots]]]$. Apparent complexity is the result of sharing morpho-phonological features up the tree as syntactic structure is built. Heads can come with a set of (morpho-)phonological features that can be shared with other heads.

The main assumptions underlying Conflation are laid out in (31). I use the notation π_X to refer to the phonological features originating on a head X° .¹⁴

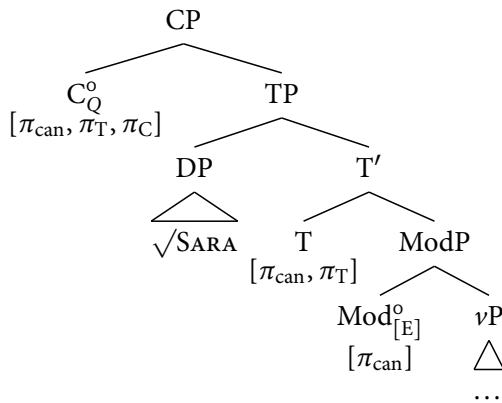
(31) *Key assumptions for Hale and Keyser's (2002) Conflation (Based on Harley 2004):*

- a. The label of any constituent has ALL the features of the head, including some representation of a phonological matrix π .
- b. Conflation occurs when a constituent α is merged with a sister head β whose set of features is 'defective'. The features π_{α} are merged into π_{β} .
- c. For Economy reasons, the conflated set of features is only pronounced once, in its uppermost position.

As the tree is built via Merge, the features π are passed up the tree, on the assumption that the label of a phrase shares all of the features of the head. SAI occurs when the phonological features on C° are defective and the phonological features of T° are conflated with those on C° . Recall from the discussion at the end of Section 3.2 that I assume modals do not originate in T° but move there from some lower position. In this case, then, Mod° (short for Modal°) bears the [E]-feature:

(32) Can Sara touch her toes?

Output of narrow syntax



Gribanova's (2018) proposal is that (morphological) head movement occurs post-syntactically, whereas Harley's (2004) and Platzack's (2013) proposals piggyback on syntactic operations, and therefore entail that head movement has a narrow syntactic component.

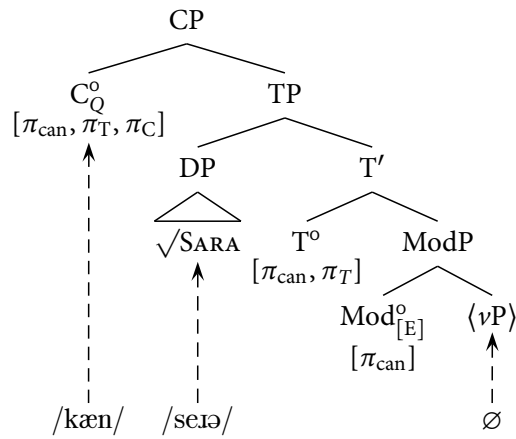
¹⁴ Harley refers to such features as the *p-sig* of a head. I find this label a bit too cumbersome, and so I adopt Platzack's (2013) convention instead; see also LaCara 2016.

Notice in (32) that Mod° , the head bearing the $[\text{E}]$ -feature following discussion at the end of Section 3.2, remains *in situ*. Although the π -features associated with Mod° and T° (π_{can} , π_T) have been conflated with those on C° , the heads T° and Mod° itself remain in their base positions. This means that when Mod° bears the $[\text{E}]$ -feature, as it does here, the $[\text{E}]$ -feature does not move to C° .

Because the $[\text{E}]$ -feature has not moved to C° , it is not possible for SAI to extend the domain of ellipsis to include TP. Furthermore, this allows us to explain why auxiliaries license vPE in their base positions – the licensing head remains *in situ* at all points of the syntactic derivation. At PF, the $[\text{E}]$ -feature will still be adjacent to vP , as shown in (33), and thus it will still give the command to PF not to pronounce any of the material in its complement even though the phonological features of its host are pronounced elsewhere in C° . Although the material associated with T° (π_{can} above) is pronounced in C° , the $[\text{E}]$ -feature does not move since the $[\text{E}]$ -feature is not part of the phonological matrix of T° . Thus, clausal ellipsis is impossible.

(33) Can Sara ~~touch her toes~~?

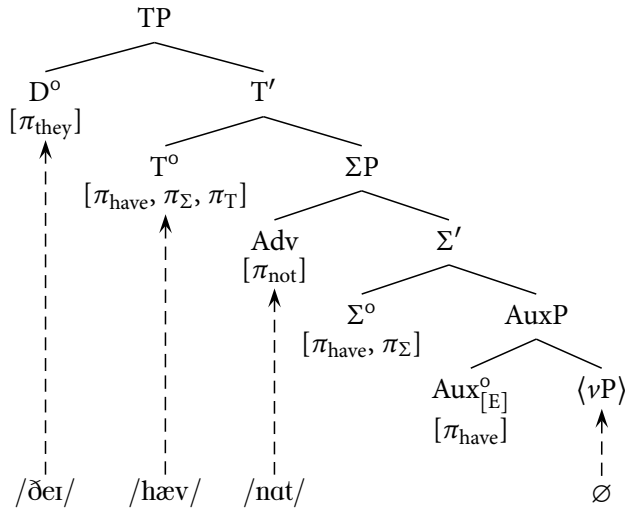
At PF, after lexical insertion



This logic extends straightforwardly to the other two cases discussed in Section 3. For example, the case of auxiliary movement to T° past negation, the features of the auxiliary will conflate with T° , but the $[\text{E}]$ -feature on Aux° will remain *in situ* because the auxiliary does not move. This explains why it is impossible to interpret negation as being in the ellipsis site: Negation is never in the scope of the $[\text{E}]$ -feature.

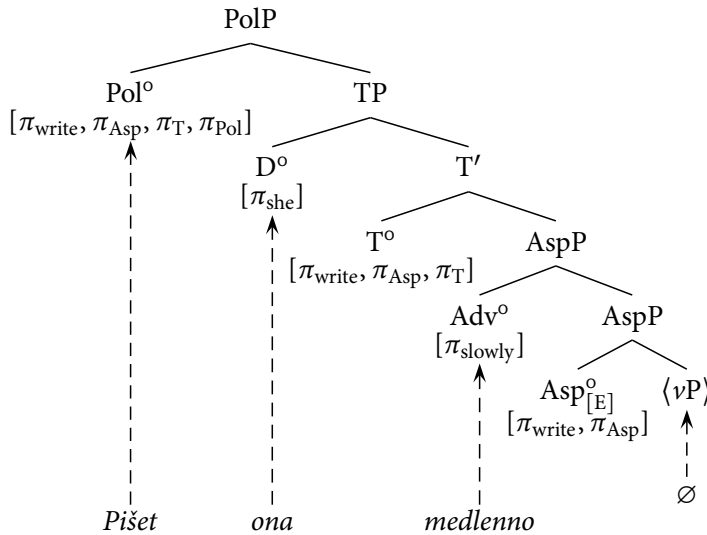
- (34) They have *(not)
- ~~kissed~~
- a pig

At PF, after lexical insertion



Assuming that the [E]-feature that deletes v Ps in Russian sits on Asp° , this analysis accounts for the Russian polarity facts as well. Although the features associated with the verb will conflate with Asp° and the features on Asp° will conflate with T° , and so forth, Asp° itself remains *in situ*, licensing the ellipsis of v P. Since the adverb adjoins to AspP , outside the scope of the [E]-feature, we do not expect it to be included in the calculation of the identity requirement:

- (35) Pišet ona medlenno pišmo komitetu i otvet na recenziju v
 write.PRES.3SG she slowly letter committee.DAT and answer to review to
 žurnal.
 journal
 ‘She’s writing (them) slowly.’

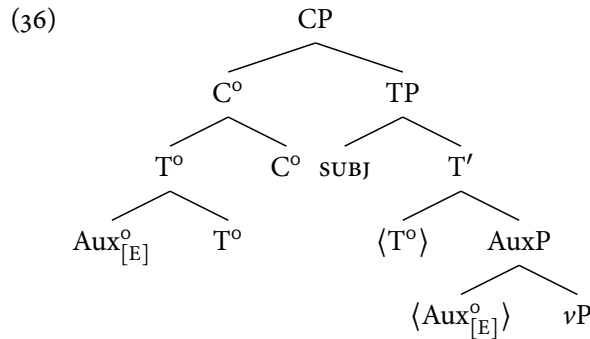


4.2 Reconstruction and LF–PF mismatches

Assuming a Conflation approach to head movement allows us to explain without further stipulation why at PF and LF the $[\text{E}]$ -feature behaves as though it has not moved from base position. However, it is worth considering the possibility that there are independent reasons for ellipsis licensing to behave in such a way. Under the Copy Theory of Movement, lower copies of a moved element can be interpreted to satisfy independent interface conditions (Fox 1999, Nunes 2004). One might therefore try to take such an alternative tack in addressing the data above.

Narrow syntactic head movement would generate a copy of a head bearing the $[\text{E}]$ -feature in a higher position. One possibility is that the resulting structures are not compositional and so cause a crash at LF/Semantics. One might assume, for instance, that the $[\text{E}]$ -feature associated with νPE cannot compose with TPs (presumably, as part of imposing the identity requirement) and as a consequence cannot licence ellipsis of a TP.¹⁵

Alternatively, one might imagine that the semantics of $[\text{E}]$ cannot compose with the other material in a complex head. Let us take Aux^0 -to- C^0 movement as an example. If we assume standard constraints on head movement, including the Head Movement Constraint (Travis 1984) and head-to-head adjunction (Baker 1988), the auxiliary bearing the $[\text{E}]$ -feature will not be immediately adjacent to TP, as shown in (36). If the $[\text{E}]$ -feature must compose semantically with its complement in order to impose the identity condition on that complement, it may not be able to do so in this position.



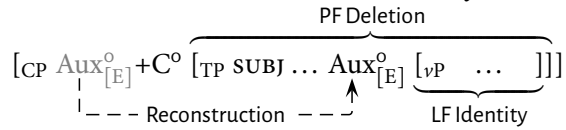
As a consequence, a lower copy of the head bearing the $[\text{E}]$ -feature would have to be interpreted at LF so that $[\text{E}]$ can compose with a νP and avoid a type mismatch (*i.e.*, the head bearing the $[\text{E}]$ -feature would have to syntactically reconstruct).

This reconstruction would only solve half the problem, however. It could only explain why auxiliaries do not license clausal ellipsis, but it does not immediately allow us to understand the cases where auxiliaries move to T^0 discussed in Section 3.2. Even in the case of clausal ellipsis, though, problems arise because syntactic reconstruction can only compel the

¹⁵ This objection is not actually formulable under every approach to ellipsis identity. For instance, Merchant (2001, 2004) assumes his *e-GIVENNESS*-based semantic identity approach to ellipsis identity. On this view, the $[\text{E}]$ -feature that licenses sluicing has the semantics $\lambda p : e\text{-GIVEN}(p).[p]$. However, the *e-GIVENNESS* approach assumes that variables in the ellipsis target will be existentially bound, shifting the elided element to an element of type $\langle t \rangle$. This process must happen for νPE , just as it does for sluicing, meaning that for the purposes of calculating identity elided VPs are also shifted to type $\langle t \rangle$. Thus, there can be no type mismatch under this approach.

[E]-feature to be interpreted in a lower position at LF. Regardless of whether such reconstruction occurs, the fact is that the head bearing the [E]-feature is still in its landing position at PF. This would seem to lead to a situation where the identity requirement would hold only over νP , but the entire TP could be elided at PF:

(37) *LF–PF mismatch under reconstruction of [E]:*



This predicts ungrammatical subject ellipsis as seen in (9)–(12), and further predicts that it should be possible for the elided subject to be distinct from the subject of the antecedent clause.

This issue here is that, in addition to reconstruction at LF, it must be possible to force the [E]-feature to be parsed adjacent to the ellipsis site at PF, too, but without pronouncing the head that bears the feature in this position. In other words, we would have to pronounce none of the features on the lower copy of a head except the [E]-feature. It is hard to see how to make this happen given current theoretical assumptions; it would seem to suggest a form of scattered-deletion of copies that targets only features.

The Conflation approach I advocate above encounters no such difficulties and does not need to appeal to mechanisms like reconstruction or an unattested pattern of scattered deletion to account for the data in Section 3. Rather, the generalization described there – that ellipsis licensing heads cannot license ellipsis in the positions to which they move – follows straightforwardly from a theory of head movement where heads never truly move at all. A reconstruction approach might be able to explain why the identity requirement holds only over νP , as shown in (36), but there is no obvious way to get the [E]-feature into the proper position at PF as well.

4.3 Summary

In this section, I argued that the Conflation approach to head movement correctly explains the distribution of ellipsis when licensing heads appear to move. Conflation assumes that heads remain *in situ* for the duration of a syntactic derivation. This explains why head movement does not affect the domain of ellipsis: Although morpho(-phono)logical features associated with ellipsis-licensing heads will be conflated with higher heads in the clausal spine, the heads themselves will remain in their base positions for the entirety of the derivation. Since they remain in their base positions, the amount of material targeted for ellipsis at PF will not be affected, and the scope of the identity requirement will not be extended. Attempting to save the narrow-syntactic view of head movement by forcing a lower copy of a licensing head to be interpreted cannot easily explain how to have the [E]-feature interpreted in the right position at PF.

5 Derivational approaches to ellipsis

Having established my core argument in the previous two sections, I now turn my attention to derivational approaches to ellipsis that change the derivational timing of the phenomenon so that it occurs during the narrow syntactic derivation.¹⁶ Despite this change in timing, I show here that the problem outlined in Section 3 persists, and I argue that these approaches do not, under our current theoretical understanding, allow us to maintain the view that head movement is derived by narrow-syntactic movement without introducing further stipulations into the system. My goal here is not so much to argue against these approaches as it is to show what would need to be true in order for them to be viable alternatives to my proposal in the previous section.

The argument and discussion above rely on the standard idea that ellipsis has no direct effect on the syntactic derivation. The [E]-feature is drawn from the lexicon and merged with a functional head in the numeration, but its effects are not imposed until the interfaces where the identity condition must be met at LF/Semantics and where the complement of [E] is rendered unpronounced at PF. The [E]-feature is essentially inactive in the narrow syntax.

Recent work on movement out of ellipsis sites has revisited this assumption, positing that ellipsis has detectable syntactic effects. Ellipsis, on this view, is triggered during the syntactic derivation. Rather than being an interface phenomenon, ellipsis is a syntactic operation that transfers the ellipsis site to the interfaces. The complement of the licensing head is sent to LF for immediate evaluation and to PF where it will be left unpronounced. Because the elided material is transferred to the interfaces, the elided material becomes inaccessible for further syntactic operations (it is said to be FROZEN).

Broadly speaking, there are two different versions of this approach, which are distinguished by how transfer to the interfaces is effected. The first possibility, dating back to at least Holmberg 1999 and 2001, identifies ellipsis as a form of phasal Spell Out. Under this view, either the complement of the phase head (Bošković 2014, Rouveret 2012) or a whole phase (Bošković 2014) is spelled-out as null. Aelbrecht (2010, 2016), on the other hand, argues that ellipsis cannot just be the a reflex of phasal Spell Out. She argues instead that ellipsis sites are transferred to the interfaces when a head bearing the [E]-feature enters into an Agree relation with a (potentially distinct) licensing head. Aelbrecht-style derivational approaches allow for more variation in the size of the ellipsis site and allow ellipsis to be triggered by heads other than phase heads (see also Baltin 2012).

Below, I look at the effects of head movement under these derivational approaches to ellipsis. Specifically, I concentrate on Aelbrecht's (2010) approach. I argue that it is necessary to stipulate that A-movement triggered by T° must precede head movement in order to get the facts straight. Even if we accept an extrinsic ordering of the operations triggered by a head, such an ordering predicts that verb-stranding verb phrase ellipsis should not exist. Space considerations prevent me from providing a full discussion of phase-based approaches to ellipsis, but I do offer some remarks about this in the summary of this section.

¹⁶ This section is, to a great extent, a response to a question raised to me by Craig Sailor, and I thank him for spurring me to think about the problem more carefully.

5.1 Non-phasal derivational approaches (Aelbrecht 2010)

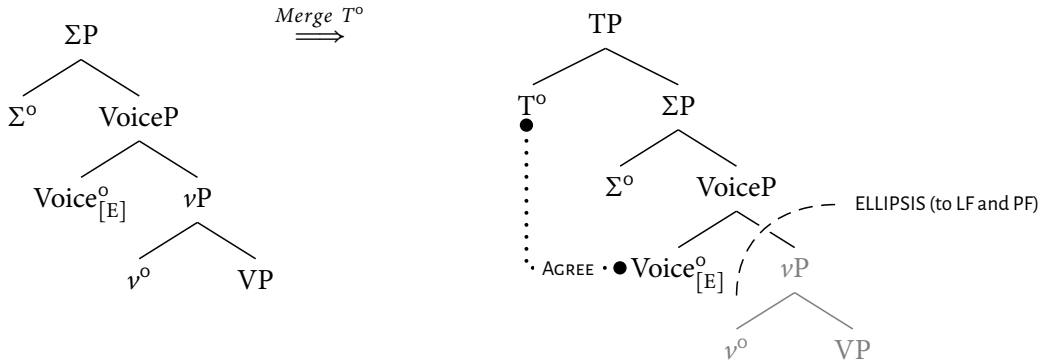
The data discussed in Section 3 are consistent with ellipsis occurring before head movement. Aelbrecht's approach, assumes ellipsis has syntactic effects and thus raises the possibility that ellipsis can directly interact with syntactic movement. This approach has proven useful in explaining why head movement out of ellipsis sites is apparently impossible in the North Germanic languages due to its ability to apparently block head movement under certain derivational circumstances (Gribanova and Mikkelsen 2018, Sailor 2018), so it is worth considering what predictions it makes for the data discussed in this paper. I show that while it may be a promising alternative to the proposal in the previous section, it requires making some specific assumptions about the ordering of operations triggered by a single head.

Aelbrecht's approach dissociates ellipsis licensing from the head that elides its complement. Under her system the $[E]$ -feature elides its complement and imposes the identity requirement. Unlike in standard Merchant-like theories, ellipsis is not delayed until after Spell Out. Instead, the complement of $[E]$ is sent to the interfaces as soon as a (potentially distinct) licensing head is merged, making ellipsis, by hypothesis, more akin to Spell Out.

For ν PE, Aelbrecht assumes that Voice^o bears the $[E]$ -feature, following Merchant (2013), and that the licensing head is T^o , following Lobeck (1995). When T^o merges, it enters an Agree relation with Voice^o which triggers ellipsis of ν P, as shown in (38). ν P is thereby transferred to the interfaces. It is evaluated for identity at LF and rendered phonologically null at PF.

(38) *Ellipsis licensing via Agree:*

(Aelbrecht 2010)



Because Aelbrecht's approach still relies on placing $[E]$ -features on heads, the prediction is that $[E]$ -feature should be movable if head movement is narrow-syntactic movement. This is the same as above, only now we expect the domain of ellipsis to correlate with the position of the $[E]$ -feature when T^o merges and not necessarily with its surface position. Since the position of the $[E]$ -feature could reasonably be lower at this point of the derivation than it appears at PF, we would expect ellipsis sites to target positions that are smaller than the those delimited by the surface position of the licensing head. This characterizes most of the data in Section 3, so the question we should ask is whether the revised timing of ellipsis under Aelbrecht's approach explains those cases.

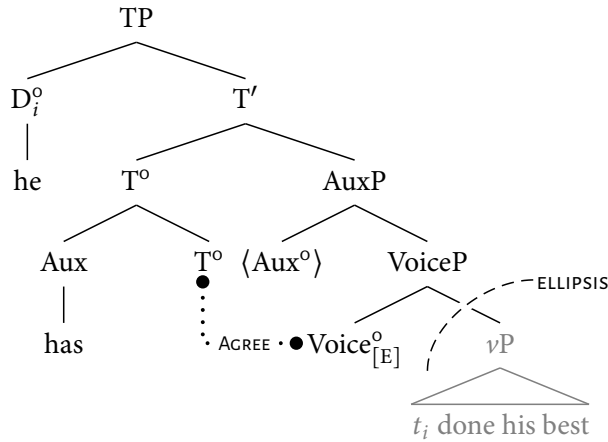
5.2 Subject–auxiliary inversion

Aelbrecht's (2010) derivational approach to ellipsis provides an account of why an auxiliary moved from T^0 to C^0 does not permit the ellipsis of TP. Recall from Section 3.1 that when an auxiliary that licenses the deletion of its complement moves to C^0 , the subject of the clause must nonetheless survive ellipsis:

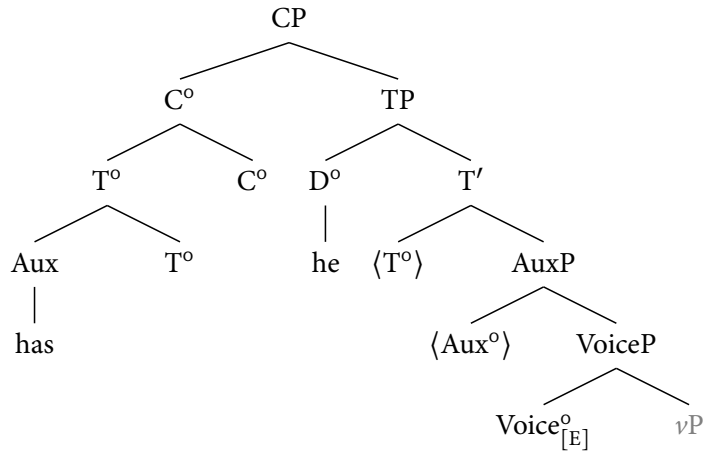
- (39) Whenever Bill says he's done his best, I have to ask myself: Has *(he) Δ ?

This falls out straightforwardly on an unmodified version of Aelbrecht's account as shown in (38). Assuming, as she does, that auxiliaries are merged between T^0 and Voice^0 , *have* does not even bear the $[\text{E}]$ -feature. When T^0 merges, it will attract *have* and trigger ellipsis of νP . After this, *have* will move to C^0 . In the following trees, unpronounced copies are in angle brackets:

- (40) Merging T^0 triggers ellipsis, auxiliary movement:



- (41) Merging C^0 triggers SAI:



I argue that we do need to modify her assumptions slightly, however (and this will become important below). It must be possible for the complement of auxiliaries to undergo

ellipsis, not just Voice^o. In particular, we see cases where both the passive and aspectual *be* must be in the target of ellipsis when aspectual *have* is in the derivation. Aspectual *be* also licenses the ellipsis of passive *be*:

- (42) a. Lex hasn't been reading the book, and but Timmy has (been) Δ.
 b. Timmy hasn't been being watched, but I know his sister has (been) Δ.
 c. This car has been washed, but this truck hasn't (been) Δ.
 d. The students are being tested, and the professors are Δ, too.

I take this to indicate that it must be possible for the [E]-feature to merge on heads higher than Voice^o. The fact that aspectual *be* can be deleted in (42a) and (42b) suggests that *have* must be able to bear to the [E]-feature. The fact that passive *be* is deleted in (42b)–(42d) suggests that the head bearing the passive auxiliary must be able to be in the ellipsis site. Aelbrecht (2010: 175), in fact, assumes that passive *be* is merged in Voice^o, so if it can be inside the target of ellipsis then the [E]-feature must be merged higher than Voice^o. Let us assume, then, that the auxiliaries can bear the [E]-feature.¹⁷

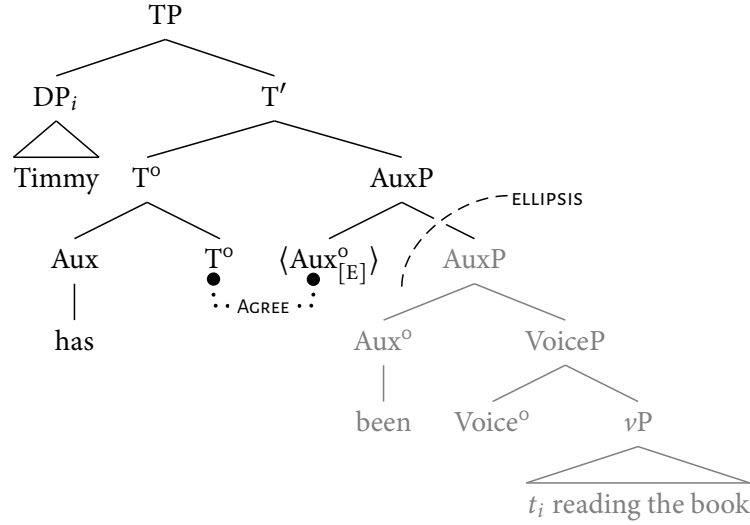
If we make this assumption, Aelbrecht's approach still predicts that moving an auxiliary bearing the [E]-feature to C^o will not trigger ellipsis of TP because vPE will happen before C^o even merges. When T^o merges, it will agree with the [E]-feature on an auxiliary, licensing ellipsis of its complement. Only then will T^o move to C^o:

¹⁷ Admittedly, this is incompatible with Aelbrecht's (2010) approach to limited extraction out of ellipsis sites. She assumes that Voice^o is a phase head and that *wh*-extraction out of vP will therefore proceed through SpecVoiceP. Eliding VoiceP should block *wh*-movement out of vPE sites, since any material in SpecVoiceP will be sent to the interfaces. This predicts that ellipsis of auxiliaries should also block *wh*-extraction from an associated vPE site. This prediction is not borne out:

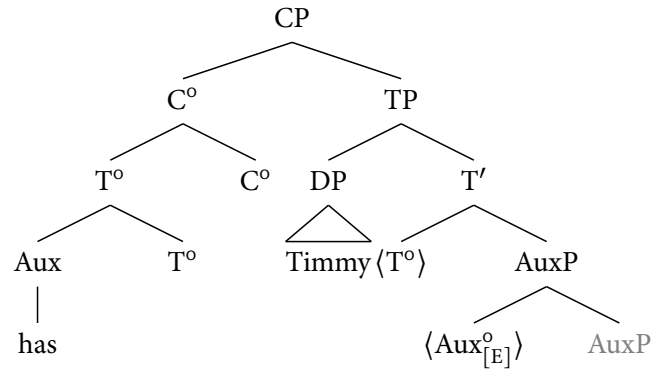
(i) I know which book John has been reading but not [which one]_k Sheila has ~~been reading~~ _k.

This is a problem for Aelbrecht's analysis, regardless of the argument about head movement in this paper. Placement of the [E]-feature on Voice^o does not permit the full range of auxiliary stranding facts, but moving the [E]-feature to other positions will not permit the full range of extraction. I will not attempt to resolve the conflict here.

(43) *Step 1: Merging T^0 triggers ellipsis and auxiliary movement*



(44) *Merging C^0 triggers SAI:*



This works because VPE will always be triggered before T^0 -to- C^0 movement under Aelbrecht's assumptions. This is exactly the ordering suggested in Section 3.4: Ellipsis must derivationally precede head movement. But we are not totally out of the woods yet. The careful reader may have noticed that the tree in (43) does not specify whether ellipsis occurred before or after the auxiliary *have* moved to T^0 . For the derivation represented in (43) and (44), this ordering does not actually matter. If ellipsis occurs after head movement, the result will be the same, only the higher AuxP will be deleted.

But notice that this returns us to a renewed version of the problem outlined in Section 3. The position of the head bearing the $[E]$ -feature can still be affected by head movement, only now we have to be concerned with where that head is when T^0 triggers ellipsis. In order to understand auxiliary movement to T^0 and Russian polarity focus, we are forced to adopt a very specific timing of the operations triggered by T^0 .

5.3 Auxiliary movement, Russian polarity focus, and the order of operations

In order for Aelbrecht's (2010) derivational approach to ellipsis to account for the facts discussed in Sections 3.2 and 3.3, it is necessary to specify that the operations triggered by a head must proceed in a specific order: A-movement < ellipsis < head movement. I know of no independent motivation for this ordering, and there are reasons to believe that such an order might be ruled out.

Let us begin with auxiliary movement to T^0 past negation. T^0 will need to do three things: attract the subject to SpecTP, attract the auxiliary to T^0 , and trigger ellipsis. The order in which these operations occurs is critical, since, as Aelbrecht (2010) argues, movement out of vP will be blocked after ellipsis has occurred. Therefore, subject movement to SpecTP must precede vPE ; otherwise, the subject will be in Spec vP when ellipsis occurs and should be targeted by ellipsis.

Aelbrecht (2010: 109n., 206n.) actually assumes that all operations triggered by a head happen simultaneously – that is, the operations are not ordered. She discusses this specifically in the context of A-movement, stating that ‘strictly speaking [a] subject does not move out of [an] ellipsis site prior to ellipsis, but rather simultaneously with ellipsis’ (Aelbrecht 2010: 206n.). This assumption allows her to sidestep the *ad hoc* nature of extrinsically ordered operations. But we cannot maintain this assumption here. If a head must both license ellipsis and trigger the movement of the head whose complement will be deleted, the meaning of ‘simultaneous’ becomes much murkier: If ellipsis happens simultaneously with head movement, it is not obvious what the target of ellipsis should be.

The question, then, is what the relative timing of head movement and ellipsis must be under these assumptions. This is where movement of auxiliaries past negation becomes relevant again. As discussed above, I assume that *have* can bear the $[E]$ -feature. If *have* moves to T^0 after ellipsis is triggered, then we correctly predict that negation will not be included in the ellipsis site:

(45) The students have not been reading *Moby-Dick*, and the professors have \ast (not) Δ .

a. ΣP before T^0 merges:

$[\Sigma P \text{ not } \Sigma^0 [\text{AuxP have}_{[E]} [\text{AuxP been the professors reading } Moby-Dick]]]$

b. T^0 merges, triggers subject movement:

$[\text{TP the professors}_i T^0 [\Sigma P \text{ not } \Sigma^0 [\text{AuxP have}_{[E]} [\text{AuxP been } t_i \text{ reading } Moby-Dick]]]]$

c. T^0 agrees with $[E]$, triggers ellipsis:

$[\text{TP the professors}_i T^0 [\Sigma P \text{ not } \Sigma^0 [\text{AuxP have}_{[E]} [\text{AuxP been } t_i \text{ reading } Moby-Dick]]]]$

d. T^0 triggers head movement:

$[\text{TP the professors}_i \text{ have}_k + T^0 [\Sigma P \text{ not } \Sigma^0 [\text{AuxP } t_k \text{ AuxP}]]]$

However, if we reverse the order of head movement and ellipsis, the prediction is that it should be possible for *not* to be interpreted in the ellipsis site, contrary to fact:

- (46) a. ΣP before T^0 merges:
 $[\Sigma P \text{ not } \Sigma^0 [\text{AuxP have}_{[E]} [\text{AuxP been the professors reading } Moby-Dick]]]$
- b. T^0 merges, triggers subject movement:
 $[\text{TP the professors}_i T^0 [\Sigma P \text{ not } \Sigma^0 [\text{AuxP have}_{[E]} [\text{AuxP been } t_i \text{ reading } Moby-Dick]]]]$
- c. T^0 triggers head movement:
 $[\text{TP the professors}_i \text{ have}_{[E]}^k + T^0 [\Sigma P \text{ not } \Sigma^0 [\text{AuxP } t_k [\text{AuxP been } t_i \text{ reading } Moby-Dick]]]]$
- d. T^0 agrees with $[E]$, triggers ellipsis:
 $*[\text{TP the professors}_i \text{ have}_{[E]}^k + T^0 [\Sigma P \text{ not } \Sigma^0 [\text{AuxP } t_k [\text{AuxP been } t_i \text{ reading } Moby-Dick]]]]$

This entails the order A-movement < Ellipsis < Head movement.

The same ordering is apparently necessary for explaining Russian polarity focus, particularly the data in (30), repeated here as (47). Recall that an adverb intervening between T^0 and vP permits VPE to occur under polarity focus:

- (47) *Russian* (Gribanova 2017: 1114):
- a. Ona pišet pišmo komitetu i otvet na recenziju v žurnal?
 she write.PRES.3SG letter committee.DAT and answer to review to journal
 ‘Is she writing the letter to the committee and the response to the review to the journal?’
- b. Pišet ona medlenno Δ (...a drugoj mog by pobystree).
 write.PRES.3SG she slowly but another could SUBJ faster
 ‘She’s writing (them) slowly (while someone else might have done it faster).’

It is commonly assumed that surface position of verbs in Russian (Bailyn 1995) is below T^0 . Gribanova (2013, 2017) argues this position to be Asp^0 . If we assume that TP dominates AspP , as Gribanova does, and if we assume that T^0 licenses ellipsis, which is standard for Aelbrecht (2010), then the verb will have been extracted out of the ellipsis site by the time ellipsis is licensed by the merger of T^0 .

The question then becomes what the position of the adverb is. In the surface of the polarity cases we have seen, the verb precedes the adverb. However, Bailyn (1995) shows that in canonical Russian sentences, the verb follows VP-adverbs. I will assume, then, that the adverb is adjoined to AspP .

In order to ensure that the adverb and subject are preserved by ellipsis, it is necessary for A-movement to precede ellipsis and for ellipsis to precede head movement:

- (48) a. AspP before T^0 merges:
 $[\text{AspP ADV } [\text{AspP } V^0 + v^0 + \text{Asp}_{[E]}^0] [\text{vP SUBJ } t_v [\text{VP } t_V \text{ OBJ } \dots]]]$
- b. T^0 merges, triggers A-movement:
 $[\text{TP SUBJ } T^0 [\text{AspP ADV } [\text{AspP } V^0 + v^0 + \text{Asp}_{[E]}^0] [\text{vP } t_{\text{subj}} t_v [\text{VP } t_V \text{ OBJ } \dots]]]]$
- c. T^0 agrees with $[E]$, triggers ellipsis:
 $[\text{TP SUBJ } T^0 [\text{AspP ADV } [\text{AspP } V^0 + v^0 + \text{Asp}_{[E]}^0] [\text{vP } t_{\text{subj}} t_v [\text{VP } t_V \text{ OBJ } \dots]]]]$

d. T^0 triggers head movement:

$$[_{TP} \text{ SUBJ } V^0 + \nu^0 + \text{Asp}_{[E]}^0 + T^0 [_{AspP} \text{ ADV } [_{AspP} t_{Asp} \text{ } \cancel{P}]]]$$

e. Pol^0 merges, triggers head movement:

$$[_{PolP} V^0 + \nu^0 + \text{Asp}_{[E]}^0 + T^0 + Pol^0 [_{TP} \text{ SUBJ } t_T [_{AspP} \text{ ADV } [_{AspP} t_{Asp} \text{ } \cancel{P}]]]$$

In sum, both English and Russian require the same order of operations under Aelbrecht's (2010) proposal. Nonetheless, I take it that stipulating an *ad hoc* extrinsic ordering of operations for a given head is undesirable (Sailor 2018). We should want the order of operations to fall out either due to logical necessity or else due to some more general principles. The idea that head movement is a post-syntactic or non-movement operation finds support in other domains (see, especially, Harizanov and Gribanova 2018), whereas stating that heads trigger head movement after ellipsis captures the facts presented in this paper by merely hard-coding the observation from Section 3.4 into the licensing heads themselves. The question, then, is whether there is any inherent reason head movement should follow ellipsis or, for that matter, A-movement.

The answer will depend, at least partially, on what the motivation for head movement is under a syntactic approach. If head movement is driven by some sort of strong feature or EPP diacritic, as is sometimes assumed, it is hard to see how to distinguish between head movement and phrasal movement, which is typically motivated by the same sort of mechanisms. Furthermore, it is sometimes hypothesized that head movement must derivationally precede phrasal movement. Matushansky (2006: 82–83) follows Pesetsky and Torrego (2001) in assuming that Travis's (1984) Head Movement Constraint can be cashed out as a reflex of antilocality. Essentially, head movement occurs when some head X^0 bears a strong feature that attracts the complement YP. Since YP cannot move from the complement of X^0 to the specifier of XP, Y^0 instead moves to X^0 . Matushansky's insight here is that when X^0 merges with YP, C-selection must necessarily occur in order to ensure that the proper element projects. Assuming C-selection is just Agree, this means that head movement should be triggered before any other operations associated with a head. If this logic is correct, the relative ordering of A-movement before head movement necessary for Aelbrecht's (2010) analysis is untenable.

There are also empirical reasons to question the ordering of head movement after ellipsis. The standard analysis of verb-stranding verb phrase ellipsis posits that a verb moves out of an ellipsis site to a position that bears the $[E]$ -feature. On Aelbrecht approach, this may be a case where the licensing head itself bears the $[E]$ -feature (see Sailor 2018 for some discussion).

$$(49) \quad [_{IP} V_i^0 + I_{[E]}^0 [_{VP} \text{ } \cancel{t_i} \dots]]$$

If this is indeed what happens, then head movement would necessarily have to precede ellipsis in order for verb stranding to occur:

(50) a. νP before ellipsis-licensing head merges:

$$[_{\nu P} V^0 + \nu^0 [_{VP} t_V \dots]]$$

b. Licensing head triggers verb movement:

$$[_{FP} V^0 + \nu^0 + F_{[E]} [_{\nu P} t_V [_{VP} t_V \dots]]]$$

c. *Licensing head triggers ellipsis:*

$$[_{FP} V^0 + \nu^0 + F_{[E]} [_{VP} t_V [_{VP} t_V \dots]]]$$

If the order were reversed, the verb that escapes the ellipsis site would end up frozen inside of it; the prediction would then be that there should be no verb-stranding VPE. But this reverse order – ellipsis before head movement – is precisely the one needed to explain English auxiliary movement (Section 3.2) and Russian polarity focus (Section 3.3). The result, then, is an ordering paradox.

Despite this paradox, I am not prepared to categorically rule out an Aelbrecht-style approach, especially given recent shifts in our empirical understanding of verb-stranding phenomena. In a recent manuscript, Idan Landau (2018a) argues that verb-stranding VPE of the sort sketched above does not actually exist, proposing instead that many apparent instances are in fact the result of argument ellipsis processes. If he is right and this form of verb-stranding does not exist, then the sort of derivation sketched in (50) does not exist, either, and the ordering paradox does not arise.¹⁸

5.4 Summary

In this section, I showed that the problem described for the interaction of head movement and ellipsis licensing described in Section 3 persists under Aelbrecht's (2010) derivational approaches, since she still relies on the technical assumption that heads bear an $[E]$ -feature, and these heads can be moved. I show it is possible to account for the data in Section 3 by stipulating an order of operations triggered by an ellipsis-licensing head, but doing so is not trivial as it carries possibly contradictory implications for the theory of head movement and verb-stranding VPE.

I set aside here the possibility that ellipsis is linked to phasal Spell Out, which similarly makes ellipsis a narrow-syntactic operation rather than an interface phenomenon. Depending on the assumptions one makes about the movement of phase heads and the timing of Spell Out, the same issues that arise under Aelbrecht's (2010) approach can also arise under phase-based approaches to ellipsis. For instance, if one assumes that ellipsis is the null Spell Out of a phase but that Spell Out is delayed until a higher phase head merges (see, e.g., Bošković 2014 and Harwood 2013), the prediction is that movement of the lower, ellipsis-licensing phase head should extend the ellipsis domain. Conversely, if we assume something like den Dikken's (2007) Phase Extension approach to ellipsis, whereby movement of a phase head increases the size of a phase, it seems to be that V^0 -to- Pol^0 movement of the sort seen in Russian should require ellipsis of TPs, contrary to what I show in Section 3.3.

Part of the issue here is that approaches to ellipsis and phases are fairly diverse, and the way phases interact with head movement has yet to be fully hammered out, so providing an adequate discussion of these intricacies in the space provided would take us very far afield. I leave these questions to future research.

¹⁸ Landau's (2018a) proposed analysis looks quite similar to the one I argue against here. His assumptions about ellipsis largely follow Aelbrecht (2010), though with some differences, and he proposes that head movement *does* expand the domain of ellipsis licensing heads. However, this is constrained, in part, by phase boundaries and the need for the head of an elided phrase to be PF-visible. There are a number of technical assumptions that support this analysis, and I cannot do them justice in the space provided.

6 Conclusion

In this paper I argued that evidence from ellipsis licensing shows that heads do not undergo syntactic movement. I provided evidence from the interaction of head movement and ellipsis licensing consistent with the view that ellipsis must precede head movement and that this follow naturally from a theory of head movement where heads do not actually undergo syntactic movement, and I argued that this is straightforwardly cashed out under the assumption that head movement effects are derived in a manner distinct from phrasal movement. I then turned to Aelbrecht's (2010) derivational theory of ellipsis in which ellipsis is triggered in the syntax. I showed that the timing of operations necessary for this to work requires an extrinsic ordering of operations but that this ordering may conflict with other theoretical and empirical requirements.

As mentioned in the introduction, I set aside arguments that head movement must have some semantic effect, including arguments that head movement can effect the LF scope of modals (Lechner 2007), and arguments from Hartman (2011) and Messick and Thoms (2016) that head movement leaves traces. Neither of these possibilities are obviously compatible with the conclusions I make above. As promised, I leave this conflict for future research. However, if head movement really does have a detectable LF/Semantic effect, as these authors suggest, then the prediction is that moving other heads that are active at the interfaces, such as ellipsis-licensing heads, should have detectable effects as well. I have argued in this paper that prediction is not borne out.

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