

# Constraining Head-Stranding Ellipsis

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## Abstract

Ellipsis of a constituent whose head has moved out of it ("headless ellipsis") is possible in some cases but not in others. Headless ellipsis is licensed only if the stranded head has not crossed a spellout domain. The reason is that the silencing instruction responsible for ellipsis must be PF-visible on the *head* of the elided constituent, and PF-visibility is cut off at spellout domain boundaries. A parallel effect is observed with remnants of head movement that are frozen for movement ("headless movement"). The two effects can possibly be united if ellipsis and copy deletion recruit the same silencing instruction at PF, hosted on the head of the deleted constituent. A third, mirror-image effect is observed with reprise fragments, which must be visibly headed. This time head movement removes the PF instruction that spares these fragments from ellipsis. Overall, these phenomena establish the significance of headedness for the syntax-PF interface.

## 1 Introduction: The road not taken to Lasnik's puzzle

The starting point of this inquiry is a puzzle made famous by Lasnik (1999a,b), concerning the interaction of head movement and ellipsis in sluicing.

- (1) A: Mary has dated someone.  
 B: Who (\*has)?  
 C: Who has Mary dated?  
 D: \*Who Mary has dated?

On the current syntactic understanding, two operations take place in the derivation of (1B). First, a *wh*-phrase is extracted to the interrogative position [Spec,CP]; second, the TP complement of the interrogative C from which the phrase has moved undergoes ellipsis (here and throughout, shading represents ellipsis).

- (2) [CP Who<sub>i</sub> C [Q,wh] [TP Mary<sub>k</sub> [T has<sub>j</sub> [AuxP t<sub>j</sub> [VP t<sub>k</sub> dated-v [VP t<sub>v</sub> t<sub>i</sub> ]]]]]]

Lasnik observed that this derivation fails to exhibit T-to-C head movement (or Aux-inversion) that is otherwise obligatory in the nonelliptical variants. Comparing (1B) and (1D), it appears that the auxiliary in T must raise to C unless TP is elided. Lasnik broke this puzzle into two smaller questions: (i) What *allows* the head to stay in-situ in the elliptical derivation? and (ii) What *prevents* the head from raising in the elliptical derivation? The answer to (i) was summarized as "salvation by deletion". The feature driving head movement was assumed to reside on the moving head itself, T in this case. Unchecked features are ill-formed at PF. Normal checking (via movement) removes them

during the derivation, but PF deletion can achieve the same result: the offending feature is absent from the relevant output representation. Thus, ellipsis of a head with unchecked features is "as good as" raising that head to check the feature, as far as PF is concerned.

Note, though, that this only answers question (i). Why *can't* the head move out of the ellipsis site (note the asterisk in (1B))? Lasnik was careful not to invoke any economy-inspired reason, presumably due to undesirable look-ahead and globality complications. To prevent T-to-C movement in matrix sluicing, Lasnik (1999b:fn. 14) proposed that agreement between C and its specifier, necessary for ellipsis, is disrupted by T-to-C movement. This account is not fully convincing and indeed, subsequent studies have strengthened Lasnik's analysis into a full-blown bleeding account, where ellipsis simply bleeds head movement out of the elided constituent (Boeckx and Stepanović 2001, Hein 2018).

I discuss the problems with the bleeding accounts in section 4. At this stage, it is important to point out that this incompatibility between T-to-C movement and TP-ellipsis has been documented in a variety of similar constructions and languages, suggesting that it is a quirk neither of English nor of sluicing per se (Merchant 2001:62-74, van Craenenbroeck & Lipták 2008).<sup>1</sup>

Right before adopting the "salvation by deletion" account, however, Lasnik (1999b) briefly considered and rejected an alternative idea. This idea is the conceptual ancestor of the analysis to be developed here. It focuses on the obvious correlation between the blocking of movement from an ellipsis site and the *status* of the element whose movement is blocked. (3) is how Lasnik formulated this generalization.

(3) XP ellipsis is prohibited if XP has lost its head.

The core insight behind (3), I maintain, is just right. It is the fact that the attempted movement is by the *head* of the constituent targeted for deletion that causes the problem. This insight is lost in all other approaches to the problem. On the PF-bleeding analysis, for example, head movement is phonological and so ellipsis, a PF operation, bleeds it. Headedness is incidental to the account; what matters is where (in which component of the

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<sup>1</sup> Lasnik (1999b) grouped together with (1B) the ungrammaticality of (ii). This was motivated by his analysis of transitive clauses in terms of overt object shift and overt V-raising past the raised object. In the pseudogapping construction (i), this V-raising is bled by ellipsis of the source VP of the verb, explaining the "trapping" of V inside the ellipsis site parallel to the trapping of T in the ellipsis site of sluicing.

- i. Mary hasn't dated Bill, but she has Harry (\*dated).
- ii. \*She has Harry dated.

This analysis, however, is no longer tenable. There is considerable evidence that the pseudogapping remnant raises to a relatively high, clause-medial focus position (Gengel 2013), above VoiceP (Merchant 2013) and even above the Aux projections (Thoms 2016a). Thus V-raising, even if real, occurs entirely *inside* the domain of pseudogapping ellipsis, and cannot provide evidence for any bleeding relation between the two.

grammar) movement takes place. In contrast, in the analysis to be developed in section 2, the problem arises because the same head simultaneously mediates ellipsis (of its maximal projection) and movement (of itself).

Also implicit in Lasnik's generalization is the claim that bleeding works from head movement to ellipsis and *not* the other way round (as commonly assumed). It is head movement, *in the syntax*, that destroys the context for ellipsis (in the syntax or at PF, that is left open). This too will be a feature of the proposed analysis. Nevertheless, I will argue that (3) cannot be maintained in its present unrestricted form, for there are demonstrable instances of this kind of derivation, depicted in (4).

- (4) *X-stranding XP-ellipsis*  
[<sub>YP</sub> ZP [<sub>Y'</sub> [<sub>Y</sub> X<sub>i</sub>-Y] [<sub>XP</sub> t<sub>i</sub> [<sub>WP</sub> ... ]]]]

Understanding which grammatical contexts give rise to permissible X-stranding XP-ellipsis derivations and which do not, and crucially, why this is so, is the chief theoretical goal of this article.

Another instance of this type of derivation is Verb-stranding VP ellipsis (VSVPE), proposed for many languages.<sup>2</sup> Indeed, the main reason why Lasnik abandoned (3) was the alleged evidence that languages like Hebrew, Portuguese and Irish abundantly employ VSVPE – in stark violation of (3) - to generate object-gap sentences (and in Irish, bare-verb sentences). However, this evidence has now undergone critical reassessment. First, the Irish facts have been understood, for some time now, to involve *TP ellipsis* under a polarity head, a process sufficiently distinct from VSVPE (see discussion and references in section 3.2). For Hebrew, VSVPE is a misanalysis, which should be replaced by Argument Ellipsis (AE), much in the spirit of current work on East Asian languages (Landau 2018). And Portuguese, together with Hindi and Russian, also fails to provide evidence for VSVPE, and in fact provides evidence against it (Landau to appear). Lasnik's reasons for not pursuing (3), then, have dissolved.

I end the discussion in Landau to appear with the following puzzle: Why do languages that employ both V-raising out of VP and VP-ellipsis that strands auxiliaries (e.g., Hebrew, Chinese, Portuguese and Russian) not combine these two operations into a single derivation? What is it that blocks VSVPE? Notice the striking parallelism to Lasnik's puzzle: What is it that blocks stranding of T in C when TP-ellipsis applies to produce matrix sluicing? Under the analysis to be developed below, these two puzzles coalesce into one.

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<sup>2</sup> van Craenenbroeck & Merchant (2013) observed that the popular bleeding account ("ellipsis bleeds head movement") for the absence of T-to-C movement in matrix sluicing would incorrectly rule out VSVPE derivations, which are presumably abundant. They concluded that "a unified account of all these cases is still lacking" (p. 721). If I am correct, the danger of inconsistency does not come from VSVPE (which does not exist); rather, it comes from other instances of X-stranding XP-ellipsis, discussed in section 3.

The upshot is this: UG indeed does not tolerate certain instances of X-stranding XP-ellipsis (Lasnik was right about this); matrix sluicing is such an example, but pseudogapping is not (Lasnik was right about the former, wrong about the latter). Finally, the absence of VSVPE is another instance of this UG prohibition (Lasnik was wrong about it), but other cases do employ X-stranding XP-ellipsis, suggesting that we need to make the possibility of this derivation sensitive to certain features of the syntactic environment. In fact, an endeavor in this spirit has recently been made in Sailor 2018; I return to discuss it in section 4.<sup>3</sup>

The structure of this article is as follows. Section 2 develops a theoretical account with the goal of distinguishing between admissible and inadmissible X-stranding XP-ellipsis derivations. The account rests on three central ideas. First, the licensing relation for ellipsis is established with the *head* of the elided constituent, rather than with the sister of that constituent. Second, the head bearing the "ellipsis feature" must be PF-visible (a reformulation of Lasnik's insight that the elided constituent should not "lose its head"). Third, PF-visibility is "cut off" at spellout domain boundaries, such that those head movements that cross them are unable to trigger ellipsis, while those that do not cause no trouble.

Section 3 turns to two types of *legitimate* X-stranding XP-ellipsis derivations: Ellipsis of AuxP following Aux-to-T raising in English, and ellipsis of TP following Aux- or V-raising to a polarity head in verb-echo answers, a common response strategy across languages, illustrated here in Finnish, Irish, and Hungarian. Section 4 asks whether existing accounts of the interaction between head movement and ellipsis can generate the pattern of selective availability of X-stranding XP-ellipsis, reaching a negative answer. Section 5 considers the possibility of understanding certain restrictions on fronting of headless constituents in terms of the same underlying PF operation that restricts headless ellipsis; it then extends the logic of head-bound PF-visibility to the analysis of reprise fragments, which similarly cannot be headed by a trace. Section 6 concludes the article.

## **2 The limits of head-stranding ellipsis**

This section offers an explicit answer to the question of which types of X-stranding XP-ellipsis are syntactically admissible and which are not. Subsequently, it develops a theoretical account that explains the peculiar cut between the two types.

X-stranding XP-ellipsis is not available when T raises to C and TP is deleted, as in matrix sluicing.

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<sup>3</sup> Sailor's (2018) work is exceptional in addressing the tension between the two conflicting bodies of evidence on X-stranding XP-ellipsis. On head-stranding ellipsis in general, see Lasnik 1995, 1997, 1999a,b, 2001, Potsdam 1997, Roberts 1998, Merchant 2001, 2015, Goldberg 2005, van Craenenbroeck and Lipták 2008, Schoorlemmer and Temmerman 2012, Lipták and Saab 2014, Thoms 2015, Gribanova 2017, 2018, McCloskey 2017, Hein 2018.

- (5) A: He has found something interesting.  
 B: \*What has [he has found what]? / What [he has found what]?

X-stranding XP-ellipsis is also not available when V raises to Asp or T and VP is deleted; thus, so called VSVPE does not exist, and object gaps like the one in the second sentence of (6a) (from Hebrew) are derived along the lines of (6b) and not along the lines of (6c) (Landau 2018).

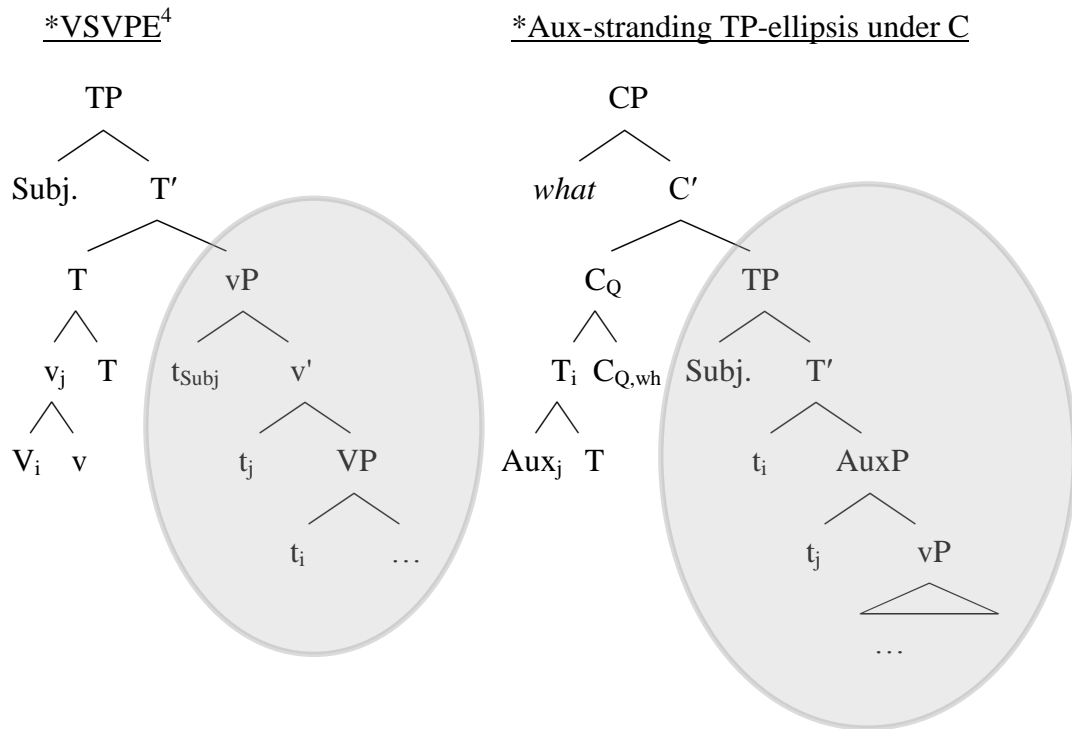
- (6) a. Gil hizmin et axot-o. Yosi gam hizmin \_\_\_\_.  
 Gil invited ACC sister-his. Yosi too invited  
 ‘Gil invited his sister. Yosi did too.’
- b. *AE*  
 [<sub>TP</sub> Yosi<sub>i</sub> [<sub>T</sub> gam [<sub>T</sub> hizmin-v-T [<sub>VP</sub> t<sub>i</sub> [<sub>v</sub> t<sub>v</sub> [<sub>VP</sub> t<sub>v</sub> [<sub>DP</sub> et exoto ] ]]]]]]
- c. \**VSVPE*  
 [<sub>TP</sub> Yosi<sub>i</sub> [<sub>T</sub> gam [<sub>T</sub> hizmin-v-T [<sub>VP</sub> t<sub>i</sub> [<sub>v</sub> t<sub>v</sub> [<sub>VP</sub> t<sub>v</sub> [<sub>DP</sub> et axoto ]]]]] ]]

Nevertheless, X-stranding XP-ellipsis *is* instantiated in two other environments: AuxP-ellipsis under T and TP ellipsis under Pol, discussed in sections 3.1 and 3.2, respectively. An example of the former is given in (7a) (from Hungarian), while the latter – also known as Polarity ellipsis – is exemplified in (7b).

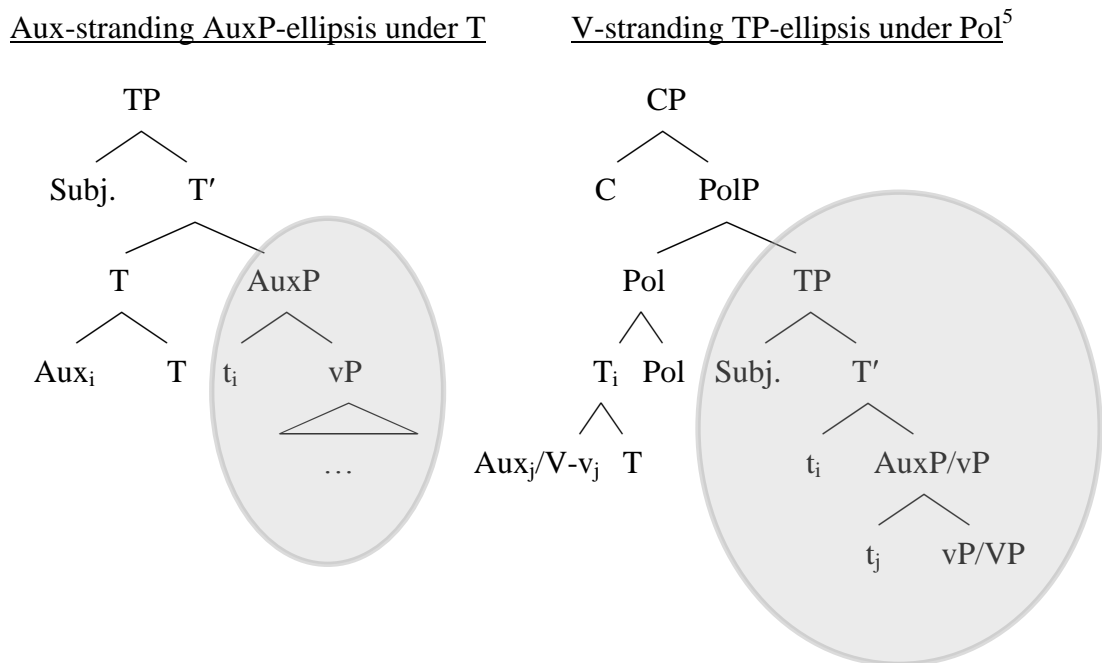
- (7) a. Julie is working hard lately and Suzan is too.
- b. A: Meg hívta János a szomszédokat?  
 VM invited János the neighbors  
 ‘Did János invite the neighbors?’
- B: Meg hívta.  
 VM invited  
 ‘He did.’ (Lipták 2019)

To facilitate the following discussion, I will schematize these four syntactic environments (the shaded areas represent the elided constituents).

(8) *Prohibited X-stranding XP-ellipsis*



(9) *Permitted X-stranding XP-ellipsis*



The challenge is to isolate the grammatically relevant demarcation line between (8) and (9). The next section addresses this challenge.

<sup>4</sup> The landing site of V may be Asp rather than T (Gribanova 2013); VSVPE is still unavailable.

<sup>5</sup> Or PolP ellipsis under Foc (Holmberg 2016); V-stranding PolP-ellipsis is still available. The stranded head may be V or Aux, depending on which one has raised to T.

## 2.1 Pronouncing head chains across a spellout domain

That phases, as the fundamental derivational units, are crucially implicated in ellipsis, is a natural and appealing idea. The most straightforward way of implementing this idea is to state, quite simply, that ellipsis only targets phases – either the full phase or its complement, the spellout domain.<sup>6</sup> Appealing as it may be, this positive licensing idea faces considerable difficulties. A growing body of research on the crosslinguistic distribution of ellipsis has revealed that the licensing problem is far more intricate than initially suspected. In fact, it seems that any licensing theory of ellipsis must incorporate some irreducible, idiosyncratic parametric statements, amounting to a list of the functional heads (or even lexemes), in each language, that license ellipsis of their complements (the [E]-bearing heads, in Merchant's (2001) influential framework).

Consider, for instance, the fact that VPE (or TP ellipsis) in French and Dutch occurs only under non-epistemic modals (Aelbrecht 2010); or the fact that VPE in Capeverdean is licensed in polar questions but not in coordination, although in Portuguese it is licensed in both environments (Costa, Martins and Pratas 2012); or the fact that NP-ellipsis is licensed under *each* but not under *every* in English. These and parallel distinctions inevitably motivate a degree of arbitrariness in ellipsis licensing that is not likely to be diminished by adding the "phase condition" on ellipsis targets. Furthermore, an attempt to pick out just the right targets for ellipsis with the already fluid concept of "phase" risks circularity (often there are no independent criteria for establishing phasehood other than deletability).

Phasehood, then, does not seem to contribute to a *positive* licensing condition on ellipsis. However, it may still indirectly interact with a *negative* condition. In particular, it may well be that certain configurations resist ellipsis because of some grammatical condition that is keyed to phase boundaries. This is the intuition I would like to pursue below. This direction looks particularly promising for situations like (8)-(9), where ungrammaticality is not rooted in the *category* of the elided constituent. After all, VP-ellipsis and TP-ellipsis are both possible in principle (hence, satisfy whatever positive licensing conditions may be in place). Rather, it is the interaction of head movement with particular configurations of ellipsis that incurs the violation.

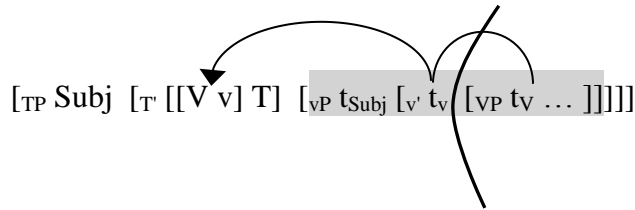
Let us return, then, to the structures in (8)-(9), now adding phasal information. In (10), shading marks the elided constituent and the arcs delineate spellout domains. I adopt the most conventional assumptions regarding phases: The phase heads are *v* and *C* and their complements are spellout domains.

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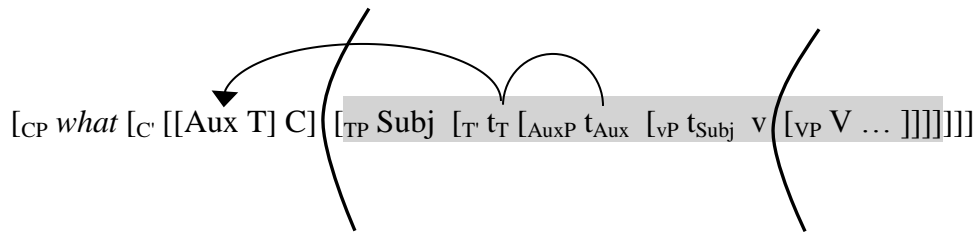
<sup>6</sup> See Holmberg 2001, Gengel 2007, Gallego 2010, van Craenenbroeck 2010, Baltin 2012, Rouveret 2012, Cheng 2013, Harwood 2013, Bošković 2014 and Aelbrecht & Harwood 2015.

(10) *Prohibited X-stranding XP-ellipsis*

a. \*VSVPE

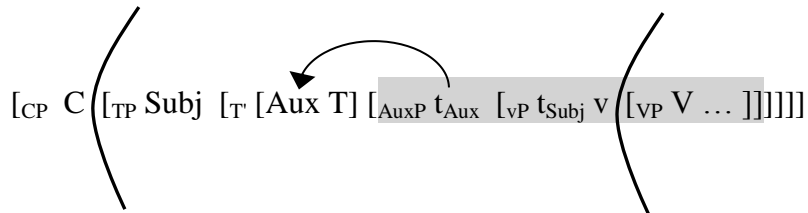


b. \*Aux-stranding TP-ellipsis under C

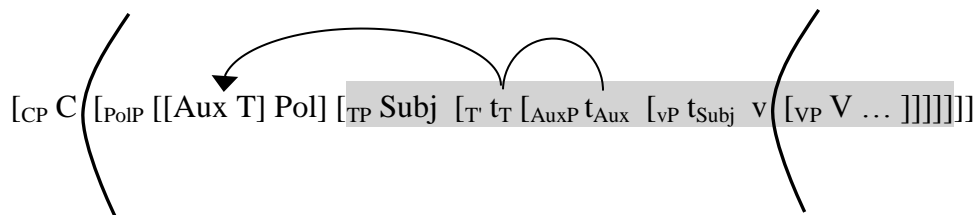


(11) *Permitted X-stranding XP-ellipsis*

a. Aux-stranding AuxP-ellipsis under T



b. Aux-stranding TP-ellipsis under Pol<sup>7</sup>



There is a structural distinction between the possible and the impossible cases of X-stranding XP-ellipsis that immediately stands out: In the ungrammatical cases (10a-b), V-movement crosses a spellout domain, whereas in the grammatical cases (11a-b) it does not. Specifically, in (10a) V crosses the VP spellout domain and in (10b) Aux crosses the

<sup>7</sup> Illustrated here is Aux-stranding; V-to-T movement would result in V-stranding in Pol.



TP spellout domain.<sup>8</sup> In contrast, Aux-movement in (11a-b) begins and ends in the same spellout domain – the complement of C (TP in (11a), PolP in (11b)). Note that in the VSVPE case I take V, rather than v, to be the substantive element to incur the violation (v-movement to T does not cross a spellout domain, because the TP spellout domain extends to the vP edge, including [Spec,vP] and v). The reasons for that decision will become clear in the next subsection.

This clear structural contrast holds the key to the constraint on the interaction between head movement and ellipsis. The constraint can be stated as follows.

- (12) *Constraint on Head-Stranding Ellipsis (CHSE)*  
 If  $X^0$ -movement crosses a spellout domain, XP cannot be the target of ellipsis.

It is important to see that the CHSE as such does not prevent  $X^0$  from crossing a spellout domain whenever XP is deleted. It is only when XP is the *target* of ellipsis that such a combination is ruled out. Thus, a stranded [V-v-T-Pol] complex in polarity ellipsis has started its "derivational life" in a different spellout domain (VP) from the one it ends up in (PolP). This is fine because VP is not the target of ellipsis – TP is. In contrast, in VSVPE the target of ellipsis, vP, is headed by [V-v], which crossed the VP spellout domain en route to T. This violates the CHSE. In other words, there is an intimate link between being the head of an ellipsis target and being in the same spellout domain as that target. Breaking that link is what causes trouble; the question is why.

Before we proceed to the explanation, let us note one further empirical consequence. The excluded derivation in (10a) has a simpler variant that should be just as impossible: V-to-v raising followed by VPE. This derivation should have been available for languages in which the lexical verb never leaves vP, such as English (Funakoshi 2012).

- (13) a. \* John solved the problem, and Mary solved too.  
 b. \* [<sub>TP</sub> Mary<sub>i</sub> T [<sub>vP</sub> [<sub>vP</sub> t<sub>i</sub> [<sub>v'</sub> solved<sub>j-v</sub> [<sub>vP</sub> t<sub>j</sub> the problem]]]]] too].

One can rule out this derivation by brute force: for example, by stipulating that only vP but not VP can be the target of VPE in English. This, however, seems particularly arbitrary in light of the different projections VPE may target in auxiliary constructions (Aelbrecht & Harwood 2015). In fact, I propose below that VP *is* the target of VPE in English, hence excluding (13) is not that trivial. Even if vP is the target of ellipsis, it may be embedded under VoiceP (Aelbrecht 2010, Merchant 2013), in which case the question reemerges – why can the complex head [V-v-Voice] not be stranded after vP ellipsis?<sup>9</sup>

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<sup>8</sup> I assume that the edge (= C and [Spec,CP]) of the matrix clause is no different from the edge of any embedded clause in belonging to a different spellout domain than its complement. Indeed, this should be the null hypothesis.

<sup>9</sup> Discussing parallel Danish constructions, Gribanova and Mikkelsen (2018) rule out this derivation on morphological grounds. [V-v-Voice] amalgamation, they propose, occurs at PF by raising V to v and lowering Voice to v. vP ellipsis thus eliminates all phonetic exponents of the verb. This account is less

With the CHSE at hand, however, the impossibility of (13a) falls together with all the other instances of impossible VSVPE discussed above (V-to-v movement crosses the VP spellout domain). Therefore, his account contributes an important piece – often overlooked – to solving the puzzle of why English prohibits null objects.

Echoing Lasnik's original suggestion (3), the CHSE maintains that it is head movement that bleeds ellipsis (in the relevant ungrammatical cases) and not the other way around. In fact, the opposite direction, that ellipsis bleeds head-movement, has had more currency in the past. The issue turns on whether head movement applies in the syntax or at PF; I return to it in section 4. Importantly, on the present account, the bleeding effect is not absolute but locally confined: Only when crossing a spellout domain does head movement block ellipsis. To understand why this should be so, we must be explicit about the mechanisms underlying ellipsis.<sup>10</sup>

## 2.2 PF-visibility of [E]

As a general framework, I adopt the licensing theory of ellipsis pioneered in Merchant 2001, 2004 and later developed in Aelbrecht 2010. The operative component in that theory is the feature bundle [E], which instructs PF not to pronounce the elided constituent, introduces the presupposition that the semantic value of that constituent is e-GIVEN, and determines, by choice of a host functional head, which syntactic environments will allow ellipsis.

With Aelbrecht, I assume that the licensing head need not be a sister of the elided constituent; instead, the relation between the two is mediated by Agree (see Lasnik 1999a for an early version of nonlocal ellipsis). However, I depart from both Merchant and Aelbrecht in assuming that the licensing relation is established with the *head* of the elided constituent itself. The formal differences among the three implementations are displayed below; H is the licensing head and ZP the elided constituent, a complement of X.

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principled in that nothing guarantees this particular combination of morphological operations. Thus, if some language that employs vP ellipsis were to amalgamate v with Voice by raising, either syntactically or at PF, that language should evidence VSVPE (more specifically, Voice-stranding vP-ellipsis). On the present account, such languages do not exist as a matter of principle.

<sup>10</sup> Note that the CHSE covers only half of Merchant's (2001) Sluicing-Comp Generalization (SCG), which excludes *any* non-operator material from the sluicing remnant (complementizers, particles etc.), not just raised auxiliaries. Interestingly, Merchant himself kept the two subcases of the SCG apart, offering a bleeding account for the No-Aux-raising-to-C part, and leaving the No-External-Merge part unexplained. Recent evidence undermines the second part, thus supporting the distinction: Sluicing remnants in Slovene may contain discourse particles along with the *wh*-phrase (Marušič et al. 2016).

(14) *Licensing ellipsis: three implementations*

	<b>Merchant 2001</b>	<b>Aelbrecht 2010</b>	<b>Present proposal</b>
<b>Syntactic configuration</b>	[ <sub>XP</sub> X <sub>[E]</sub> [ <sub>ZP</sub> ... Z ...]]	H <sub>[F]</sub> ... X <sub>[E,uF]</sub> [ <sub>ZP</sub> ... Z ...]	H <sub>[F]</sub> ... X [ <sub>ZP</sub> ... Z <sub>[E,uF]</sub> ...]
<b>Licensing relation</b>	X-ZP	H-X-ZP	H-Z

A number of technical as well as conceptual considerations motivate the changes in the present proposal.

As noted above, Aelbrecht's work (as well as subsequent studies) has established that the general licensing relation for ellipsis cannot be limited to sisterhood, as originally conceived by Merchant. Given this result, it is no longer clear that the head X plays any substantive role in syntax of ellipsis. Preserving it, Aelbrecht's analysis is effectively committed to the claim that ellipsis is a *ternary* relation between H (the licensing head), X (the "middleman") and ZP (the elided constituent). Eliminating the middleman, we can simply take the licensing relation to hold directly between the licensing head H and Z, the head of the elided constituent.

This simplification also solves a technical problem in Aelbrecht's system. To handle the trivial case where H=X, Aelbrecht is forced to allow Agree to operate reflexively, between two features hosted on the same head. This unnatural extension of Agree (unattested otherwise) is avoided on the present proposal; the trivial case boils down to Agree (X,Z).<sup>11</sup>

As far as the lexical entry of [E] is concerned, a slight modification is all we need: [E] instructs PF not to spell out (or not to insert phonological features under) its *maximal projection*, rather than its sister. The e-GIVENNESS presupposition is introduced as before and projects from Z to ZP. I also keep to the derivational logic of Aelbrecht's analysis: As soon as H is introduced in the structure and Agree (H,Z) is established, [E] is activated and triggers ellipsis.

Locating the [E] feature on Z, the head of the elided constituent, instead of on its sister, leads one to expect a tight dependency between [E] and properties of Z. One area where such dependencies are expected is the selectivity in types of ZP that are eligible for

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<sup>11</sup> In fact, Merchant (2001:60) proposes that the [E] feature responsible for sluicing originates on T and then moves to C to check the appropriate features ([Q,wh]), establishing "a head-head" relation. Thus, the "endocentric" approach to ellipsis, advocated here, is already implicit in Merchant's theory. Given that Agree does not require movement, [E] may stay *in-situ*. Given that the licenser need not be the closest c-commanding head, the present proposal follows in full.

ellipsis. Restrictions that encode this selectivity (e.g., ProgP must be elided but PerfP must not, finite TP can be elided but nonfinite TP cannot, etc.) could be, and have been, attributed to selectional requirements of the sister head X; but they can equally, if not more naturally, be expressed as properties of the *head* of the elided constituent, which is also the host of [E] under the present proposal.<sup>12</sup>

Another respect in which the properties of Z are crucial is PF-visibility, a notion of broader significance in the grammar, as we will see in the following discussion. PF-visibility is required of processes that apply at PF – such as ellipsis. A feature that is not PF-visible cannot effect a PF process. Note that the very same regime regulates the LF interface: Only LF-visible (i.e., semantically contentful) elements can participate in LF operations. Applying this logic to [E], we obtain the following condition.

(15) *PF-visibility of [E]*

The host of [E] must be PF-visible in its spellout domain.

I will return momentarily to the proviso "in its spellout domain". The immediate consequence of (15) is that the host of [E] must be an overt head, whether a word or a morpheme.<sup>13</sup> I suggest that for this reason, VPE in English is triggered by an [E] feature on V, not on v. American English does not lexicalize the v head, so it cannot *directly* effect ellipsis of vP. Nonetheless, there is good evidence that vP is indeed the category elided by English VPE (Merchant 2013). Why? Quite simply, because the [E]-bearing head, V, raises to v. Once the licensing head, a finite T, is merged and the external argument is extracted, ellipsis applies to the constituent headed by the derived head V-v, namely vP.

With this in mind, we can return to (10a) and justify the claim that it falls under the CHSE. The [E]-bearing head is V, which indeed crosses a spellout domain (VP) en route to T. The category targeted for ellipsis is the maximal projection of V, but given its derived position as a sister of v, this maximal projection is vP.

We are finally in a position to understand the rationale behind the CHSE. The crucial link between the PF-visibility condition for [E] (15) and the CHSE (12) is provided by the proviso "in its spellout domain", included in the former. This proviso reflects the cyclicity of spellout. In particular, a domain shipped to PF spellout is no longer accessible to further operations. Current literature varies greatly on the degree of inaccessibility assumed. Can semantic interpretation access spelled-out domains? Can syntactic operations do it?

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<sup>12</sup> For example, the restriction of AE to definite DPs in Persian (Rasekhi 2016) cannot be easily stated as a property of the governing verb, given that definiteness is not a selectional feature.

<sup>13</sup> As usual, statements about PF must identify the proper level of abstraction from actual phonetic expression that is relevant. In the case at hand, it seems that as long as the morphological paradigm to which Z's features belong is not entirely null, Z counts as PF-visible. What I have in mind are sluiced TPs whose head does not contain any overt morpheme, but still contains features registered at PF, like [PRESENT,3PL] (e.g., *I know they live around here, but I forget where*).

Aelbrecht (2010), for example, argues that spellout in general, and ellipsis in particular, makes a domain inaccessible to syntactic operations. I will not take a stand on this matter, because for present purposes it is sufficient to make the minimal, hence least controversial assumption: A domain shipped to spellout is no longer PF-visible. That is, if cyclic PF spellout means anything, it should mean that the material inside the domain is not available for the next cyclic PF spellout.

Consider what this implies for head movement that crosses a spellout domain. Suppose that ZP is a spellout domain of the phase head X and its head Z moves out of it, stopping either at X or at some head above it. Once X is merged, ZP is shipped to spellout. This makes the trace of Z inaccessible to further PF operations; let us call it "PF-invisible". In normal circumstances no problem ensues. The PF-visible position of the head-chain created by Z will be one of the positions outside ZP – usually the topmost one.<sup>14</sup>

Suppose, however, that Z carries the [E] feature. By (15), this feature must be PF-visible to trigger ellipsis. Given the above considerations, it can only be PF-visible on the head of the chain, namely, *outside* ZP. Thus, it cannot effect ellipsis of ZP, because ZP is no longer its maximal projection. Moreover, even if it carries a copy of [E] (assuming that traces are full copies), the trace of Z in the base position is no longer PF-visible.

The explanation of the CHSE, then, boils down to a "communication breakdown" between the head and foot of the chain created by the [E]-bearing head. At the point in the derivation when the maximal projection of this head is ZP, the licenser of ellipsis ( $H_{[E]}$  in (14)) is not yet in the structure. At the point in the derivation when the licenser is introduced, the foot of Z's chain is no longer PF-visible to effect ellipsis. We thus exclude, on principled grounds, cases (10a-b) – VSVPE and Aux-stranding TP-ellipsis under C. In particular, this account predicts VSVPE to be unavailable in principle: The reason it is not attested in Chinese, Hebrew, Russian, Hindi and Portuguese (Landau, to appear) is not parochial to any of these languages but instead is rooted in deep design features of syntactic derivations and the syntax-PF interface.

Turning to the legitimate derivations (11a,b), Aux-stranding AuxP-ellipsis under T and Aux-stranding TP-ellipsis under Pol, we can see that the head that escapes ellipsis does not cross any spellout domain on its way. This means that at the point when the licenser is merged (T for (11a) and Pol for (11b)), the foot trace of the Aux-chain is still PF-visible to effect ellipsis of its maximal projection.

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<sup>14</sup> See Bošković 2001 and the Corver and Nunes 2007 for discussion of interesting "abnormal" scenarios that force PF to privilege a non-topmost copy in a chain. Normally, PF-visibility exhibits "coherence" across chain links, so that a *single* copy is targeted for all PF operations, for economy reasons. Exceptions, like doubling or "scattered deletion", arise by virtue of specific spellout requirements that override economy (e.g., prosodic support). In a parallel fashion, coherence effects are observed at the LF interface (Fox 1999, Lebeaux 2009), with exceptions arising from specific scopal requirements (e.g., NPI/PPI licensing).

This concludes the explanation of how the grammar negotiates derivations that manifest X-stranding XP-ellipsis, and on what basis it decides which ones are legitimate and which ones are not. Naturally, one would like to see empirical effects of the key notion of PF-visibility (15) elsewhere, with other phenomena located at the syntax-PF interface. Such further effects will be presented in section 5.

Before we turn to the empirical discussion, let me stress that the analysis makes no absolute claims or predictions about the interaction of head movement and ellipsis. The two may happily cooccur as long as the CHSE is respected. One case that comes to mind is v-stranding VPE, a construction identified in Persian (Toosarvandani 2009), British English (Aelbrecht 2010, Baltin 2012), Welsh (Rouveret 2012) and Hindi (Manetta to appear). Consider an example from Welsh.

- (16) Prynodd Siôn y llyfr hwn a gwnaeth Mair \_\_ hefyd.  
 bought Siôn the book this and did Mair too  
 ‘Siôn bought this book and Mair did too.’

The VP consists of the verbal noun and its object, *prynodd y llyfr hwn* 'bought this book'. It is the complement of *gwnaeth* 'did', which, according to Rouveret (2012), lexicalizes an eventive v head. This v licenses ellipsis of its VP complement and subsequently raises to the canonical clause-initial position of finite verbs in Welsh. Since the raised head never was part of the elided constituent, the CHSE is not applicable. Parallel remarks hold for this construction in the other languages. Note that on the present proposal, all of these languages, *including* American English, locate the [E] feature on the lexical V. The difference lies in the identity of the licenser head – T for American English, v for the v-stranding languages.

### 3 Genuine V-stranding ellipsis

In this section I describe two varieties of V/Aux-stranding constructions that do involve head movement out of an ellipsis site. Establishing that such cases are real is vital in order to define the explanatory challenge we face: Rather than explaining why headless ellipsis is always excluded, we should explain why it is sometimes excluded and sometimes not.

Section 3.1 discusses the configuration in (11a), Aux-stranding VP-ellipsis in English. Section 3.2 turns to the configuration in (11b), Aux/V-stranding TP-ellipsis in polarity contexts, exemplified in Irish, Finnish, and Hungarian. The CHSE (12) correctly allows both types.

#### 3.1 AuxP ellipsis under T: English

The interaction of VPE and the auxiliary system of English produces an intricate set of data that has received much attention (Warner 1993, Lasnik 1995, 1997, Potsdam 1997,

Roberts 1998). A recent and comprehensive treatment of the facts is laid out in Thoms 2015, whose discussion I follow below.

Consider the following representative cases, which illustrate the range of permissible and impermissible mismatches between the verbal heads of the antecedent VP and the elided one.

- (17) a. John has [**fixed** the car] but now Mary has to [**fix** the car].  
 b. I didn't [**steal** the cake], although I could have [**stolen** the cake].  
 c. John may **be** lying to us but Mary might not [**be** lying to us].  
 d. He might [**be** rude to the guests], I know he has [**been** rude to the guests] in the past.  
 e. John is [**being** examined], and Jack really should [**be** examined] also.  
 f. Bill was<sub>i</sub> [**was**<sub>i</sub> [winning medals]] much before you were<sub>i</sub> [<sub>α</sub> **were**<sub>i</sub> [<sub>β</sub> winning medals]].  
 g. He has<sub>i</sub> [**has**<sub>i</sub> [left school]] after she had<sub>i</sub> [<sub>α</sub> **had**<sub>i</sub> [<sub>β</sub> left school]].  
 h. Mary might [**be** [home now]] as John surely is<sub>i</sub> [<sub>α</sub> **is**<sub>i</sub> [<sub>β</sub> home now]].  
 i. John could [**have** [been more helpful]]; I know his sister has<sub>i</sub> [<sub>α</sub> **has**<sub>i</sub> [<sub>β</sub> been more helpful]].  
 j. \* John was<sub>i</sub> [**was**<sub>i</sub> fired], and Mary will [**be** fired] too.  
 k. \* Chris has<sub>i</sub> [**has**<sub>i</sub> been to Rome], and his wife might [**have** been to Rome] as well.

Let us call the verbal heads of the antecedent and the elided VPs  $V_A$  and  $V_E$ , respectively. (17a-b) show that although stem identity is required for lexical verbs, inflectional morphology (expressing tense, aspect and agreement) may differ between  $V_A$  and  $V_E$ . (17c) shows that ellipsis may target an AuxP (specifically ProgP; whether PerfP can be elided is debatable, see Aelbrecht and Harwood 2015 for discussion). Similarly to lexical verbs, an auxiliary  $V_A$  and an auxiliary  $V_E$  may differ inflectionally when both are *unmoved*, as in (17d-e), or when both are *moved*, as in (17f-g). Similarly, an *unmoved* auxiliary  $V_A$  can successfully antecede a trace that is bound by an inflectionally distinct auxiliary (17h-i).

The one outstanding exception to the general tolerance for inflectional mismatch appears with a *moved*, inflected auxiliary  $V_A$  that antecedes an *unmoved*, uninflected auxiliary  $V_E$ ; this mismatch is not possible (17j-k).

Quite reasonably, Thoms (2015) argues that no simple identity condition on  $V_A$  and  $V_E$  can derive this complex array of facts, and specifically the asymmetric nature of the tolerable mismatches with auxiliary verbs. More striking mismatches that Thoms cites from VPE in Scottish Gaelic (where  $V_A$  is an auxiliary trace and  $V_E$  is a lexical trace) cast further doubt on this direction. Instead, Thoms proposes a general constraint on ellipsis to the effect that a variable (like the trace of verb movement) cannot provide an antecedent

for a non-variable (like an unmoved verb). This constraint, in turn, is derived from the idea that accommodated antecedents may not be more complex than the actual syntactic antecedent (with variables being the least complex entities).<sup>15</sup>

The significance of these data to the present discussion is twofold. First, they indicate that the Verb Identity Requirement is deeply problematic even before we turn to falsifying data involving lexical verbs (see fn. 23), that is, even when we carefully examine just the English Aux-stranding VPE data. Second, they suggest that the X-stranding XP-ellipsis configuration in (11a) is a real grammatical possibility, which cannot be excluded in principle.

To see why, consider (17f-i) again. In these cases, ellipsis targets the category labelled  $\alpha$ , which is an AuxP – either PerfP or ProgP. Crucially, the head of that AuxP has escaped ellipsis by prior raising to T. Note that the same category undergoes ellipsis *with* its auxiliary head in (17c), so there is no reason to assume a different derivation for (17f-i) (indeed, Thoms (2015) assumes AuxP ellipsis throughout). However, one might suggest that what is elided in (17f-i) is a smaller projection, the one labeled  $\beta$ , which excludes the base position of Aux; for cases like (17h), this would involve bare predicate ellipsis (as suggested in Merchant 2015). On this analysis, the English data would not instantiate (11a).

However, Aux-excluding ellipsis cannot provide a fully general account for English, even when restricted to target clauses in which Aux-to-T movement has applied. The argument rests on the observation that whenever present, a progressive form *being* must be elided (Akmajan and Wasow 1975, Sag 1976). Aelbrecht & Harwood (2015) take this fact to indicate that VPE in English minimally targets the AuxP associated with the progressive vP (when present), reflecting its status as a phase.

- (18) a. Ted was being noisy, and Robin was (\*being) too.  
b. Ted was being arrested at that time, and Barney was (\*being) too.

Given this minimal bound on VPE, any stranded progressive auxiliary must have escaped the elided vP<sub>prog</sub> – otherwise, it would have been captured and deleted with it as it is in (18). The target clauses in (19), then, must be derived as in (20).<sup>16</sup>

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<sup>15</sup> It is questionable whether the generalization holds for A-movement and  $\bar{A}$ -movement out of ellipsis sites, though. Merchant (2018) cites VPE under voice mismatch, where an A-trace antecedes a full DP, and sluicing examples, where a trace antecedes an unbound pronoun.

<sup>16</sup> For reasons that need not concern us here, Aelbrecht & Harwood (2015) adopt a paired-layering analysis of aspectual projections: a low layer where the aspectual interpretation resides (Prog or Perf) and a high one where the appropriate auxiliary (*be* or *have*) is merged. I follow this configuration in (20); importantly, even on a single layering approach (e.g., Bjorkman 2011), the combination of (18) and (19) forces the conclusion that *be*<sub>prog</sub> undergoes Aux-stranding AuxP-ellipsis. See Thoms 2010 for the claim that *all* ellipsis targets are remnants (since it is extraction out of them that licenses the ellipsis).



- (19) a. Julie is working hard lately and Suzan is too.  
 b. Julie must be working hard lately and Suzan must be too.  
 c. Julie has been working hard lately and Suzan has been too.
- (20) a. [TP Suzan [T<sup>r</sup> is<sub>j</sub>-T [vP(prog) t<sub>j</sub> [ProgP Prog [vP VP ]]] ]  
 b. [TP Suzan [T<sup>r</sup> must<sub>i</sub>-T [ModP t<sub>i</sub> [InfP be<sub>j</sub>-Inf [vP(prog) t<sub>j</sub> [ProgP Prog [vP VP ]]] ]]] ]  
 c. [TP Suzan [T<sup>r</sup> has<sub>i</sub>-T [vP(perf) t<sub>i</sub> [PerfP been<sub>j</sub>-Perf [vP(prog) t<sub>j</sub> [ProgP Prog [vP VP ]]] ]]] ]

A similar argument cannot be made for the perfect auxiliary *have*, which, according to Aelbrecht & Harwood, always originates outside the VPE site. However, the auxiliary *be* is involved in another context of Aux-stranding AuxP-ellipsis, namely, expletive constructions.

- (21) a. One moment there were squirrels outside my window,  
 and the next moment there weren't \_\_\_\_.  
 b. ... [TP there [T<sup>r</sup> were<sub>i</sub>-T [NegP not [AuxP t<sub>i</sub> [SC squirrels outside my window] ]]] ]  
 c. A: Yesterday, I saw squirrels outside my window.  
 B: \* I saw [SC squirrels outside my window] too.

Examples like (21a) are frequently cited to illustrate the syntactic activity of elided material, that is, its ability to trigger agreement on the stranded auxiliary. But they are also revealing in another sense. English has no productive process of AE or small clause ellipsis, as seen in the ungrammatical (21c). Therefore, the elided category in (21b) must be the AuxP projection from which the verb *be* has raised to T. This would make it a normal case of VPE in English.<sup>17</sup>

The bottom line is that genuine Aux-stranding AuxP ellipsis exists – hence, X-stranding XP-ellipsis is possible. Unlike VSVPE, which does not seem to be a true option in the grammar, nothing in principle bans Aux-stranding AuxP ellipsis. This contrast is explained by the present analysis (see (10a) vs. (11a)).

### 3.2 TP-ellipsis under Pol: Irish, Finnish and Hungarian

On the basis of extensive typological work, Holmberg (2016:69) estimates that roughly half of the world's languages use "verb-echo answers", that is, bare verbs optionally accompanied by a polarity particle, in response to polar questions. However, the structure of such verbal answers has been closely studied in only a handful of languages. The

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<sup>17</sup> A less obvious case of AuxP ellipsis under T may involve possessive *have* in British English (*I haven't a dependable friend. Have you?*). Assuming Kayne's (1993) influential analysis, possessive *have* is constructed from an underlying P incorporated into a copular BE. It is the latter's projection, then, that is elided following *have*-raising to T. Indeed, this compositional analysis must be favored over the lexical analysis of *have*, which implies a VSVPE derivation, against (8). I thank an anonymous reviewer for pointing out this implication.

following is a representative sample of some languages where ellipsis has been a key ingredient in the analysis.<sup>18</sup>

In Finnish, answers to polarity questions can consist of the finite verb only. In case the finite verb is an auxiliary, a modal, or a restructuring verb, it may be followed by the same sequence of nonfinite verbs that appears in the question (Holmberg 2001, 2016).

- (22) A: Osaako Liisa puhua ranskaa?  
can-Q Liisa speak French  
Can Liisa speak French?  
B: Osa (puhua).  
can speak  
'Yes, she can.'

Concentrating on the bare Aux answer first, Holmberg (2016) proposes that these replies are full sentential structures, in which V raises through T to Pol and finally to a Foc head above PolP. Ellipsis applies to the entire PolP, whose specifier hosts the subject. In simpler implementations, V raises through T to Pol and the TP complement of Pol is then elided (Martins 2016, Gribanova 2017). Since on both variants the elided category is at least as big as TP, I will refer to both with the cover term V-stranding TP-ellipsis. The differences between these two versions will turn out not to matter for our purposes.

For Aux-V replies, Holmberg assumes that Aux raises to Foc as before, and V undergoes short head movement to an Asp head above vP. vP ellipsis ensues, crucially capturing the in-situ vP-internal subject, leaving only the two verbal heads as remnants. Exactly why a lexical subject escapes the vP in the polar question but cannot escape the vP in the verbal response (yielding an ungrammatical \**Aux-Subj-V* utterance) is a puzzle Holmberg leaves unsolved. Since the analysis of these variants is less clear, I focus on the bare V constructions, which lend themselves to a V-Stranding TP-ellipsis treatment. Finally, although Holmberg (2016:58) claims that verb-echo answers in Finnish observe the Verb Identity Requirement, Gribanova 2018:fn.2) cites a grammatical question-answer pair with different verbs (antonyms) in the antecedent and the target clause.

One of the first declared cases of V-stranding ellipsis came from Irish (McCloskey 1991). In the context of arguing for VSO order as resulting from V-to-T movement past the VP-internal subject, McCloskey discussed examples of the following sort, in which all arguments and VP-internal material must be missing in the response (later dubbed "responsive ellipsis").

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<sup>18</sup> For studies of other languages, see Yaisomanang 2012 (Thai), Martins 2016 (Portuguese), Villa-García 2016 (Spanish) and Gribanova 2017 (Russian).

- (23) A: Ar                   chuir        tú    isteach ar an   phost?  
 INTERR.PAST put.PAST you in        on the job  
 'Did you apply for the job?'  
 B: Chuir.  
 put.PAST  
 'Yes.'

McCloskey initially analyzed these bare verbal responses as VSVPE. However, subsequent work on subject positions in Irish (McCloskey 1996) has made it clear that the subject in such cases does raise outside VP; hence, ellipsis must target a larger phrase (McCloskey 2005, 2011). The analysis developed in McCloskey 2012, 2017 converges on V-stranding TP-ellipsis. McCloskey also points out that the Verb Identity Requirement is observed in Irish without exceptions.

Finally, V-stranding TP-ellipsis is attested in Hungarian too (Lipták 2012, 2013, 2019). When a verbal modifier (VM) occurs in the antecedent, the verbal response may consist of VM alone or VM and the verb (24a). As in Finnish, the finite verb can be stranded along with a series of infinitival verbs (a "verbal complex"), corresponding to the heads in the complementation structure of the antecedent (24b)

- (24) a. A: Meg hívta János a szomszédokat?  
 VM invited János the neighbors  
 'Did János invite the neighbors?'  
 B: Meg (hívta).  
 VM invited  
 'He did.'
- b. A: Bea nem fogja akarni fel hívni a szüleit.  
 Bea not FUT.3SG want.INF PV invite.INF the parent.POSS.3SG.PL.ACC  
 'Bea will not want to call her parents.'  
 B: De, fel fogja (akarni (hívni)).  
 DE PV FUT.3SG want.INF invite.INF  
 'That's not right, she will.'

Lipták (2012) analyzed V-stranding ellipsis as TP-ellipsis, following V-to-T-to-Pol raising. However, on the basis of cases like (24b), Lipták (2013, 2019) proposes instead a VSVPE analysis, where VPE freely applies to VPs of different sizes, licensed at a distance from a peripheral Pol head (for a similar proposal, see Martins 2016). (24a) is analyzed as ellipsis of the entire PolP phrase (from which VM has been evacuated); this accounts for the fact that a VM-stranding response cannot reverse the polarity of the question (given that Pol and its value are included in the parallelism domain).

A problem with the VSVPE analysis is the obligatory absence of the subject – at least for the majority of Hungarian speakers.<sup>19</sup> This can only be guaranteed by preventing the subject from evacuating VP prior to VPE (thus undergoing elision with the rest of the VP). However, given that such subject raising is commonplace in VPE constructions crosslinguistically – indeed, even within Hungarian it is found in Aux-stranding VPE – it is a mystery why it may not occur under VSVPE. An alternative account, along the lines of Finnish and Irish, is to take the correlated absence of the subject and all other VP material (except the verb) as straightforward evidence for TP-ellipsis. The possibility of stranding a verbal sequence can be accommodated by remnant VP movement to a TopP projection above TP, as Holmberg (2001) originally proposed for Finnish.

As to verb identity, it is defeasible as in all other languages (except Irish, and possibly Scottish Gaelic; Thoms 2016b). Lipták (2019) shows that even synonymous but distinct verbs are allowed when a polarity particle (*yes* or *no*) is included in the response.<sup>20</sup>

#### 4 Limitations of existing approaches

In this section I discuss currently popular approaches to the interaction of head movement and ellipsis and demonstrate that they all fall short of accounting for the observed distribution of head-stranding ellipsis as summarized in (8)-(9).

One can discern two strands of theorizing on the interaction of head movement and ellipsis. The first strand, call it *the trace-asymmetry strand*, focuses on cases where the

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<sup>19</sup> A minority of roughly 20% of Hungarian speakers, according to Lipták (2013), allow the subject to be present in neutral (nonpolar) object gap sentences.

- i. % János meg evett egy banánt. Mary is meg evett \_\_\_\_.  
 János VM ate a banana Mary also VM ate  
 'János ate a banana. Mary also did.'

Lipták takes this to be a case of VSVPE as originally proposed for Portuguese, licensed by T (and not Pol). While the licensing part may be correct, these sentences may well involve AE rather than VSVPE. Short of careful testing that can tease apart these two options (see Landau to appear), the VSVPE analysis is not favored (Lipták rules out the *pro*-analysis but not the AE one). Alternatively, (i) could involve a V-stranding TP-ellipsis derivation in which the subject has moved to [Spec,PolP] (as VM does when stranded, according to Lipták) or above it, an option to be micro-parameterized.

<sup>20</sup> Hebrew also employs ellipsis of a clausal constituent from which the verb has raised, not only in polarity contexts but also in "triggered inversion" contexts, that is, XP-V-S-O sequences. As observed by Doron (1999), verb identity is not required. Note that the antecedent clause may but need not involve inversion – a fact of interest to discussions on the status of variables in parallelism considerations.

- i. be-yemey šabat ha-hanhala mašbita / mašbita ha-hanhala et tnu'at ha-rakavot,  
 in-days Saturday the-management shuts.down / shuts.down the-management ACC traffic the-trains  
 u-vi-yemey rišon mexadešet \_\_\_\_.  
 and-in-days Sunday renews  
 'On Saturdays the management shuts down the operation of trains and on Sundays they reopen it .'

Given that Hebrew bans subject *pro*-drop in present tense, the second conjunct must involve ellipsis.

elided category is headed by a lexical head but its antecedent is headed by a verbal trace; this configuration yields ungrammaticality under certain circumstances. The second strand, call it *the PF bleeding strand*, focuses on cases where an otherwise expected head movement fails to occur because the base position of the head is contained in an ellipsis site; the result is grammatical without head movement and ungrammatical with it.

The trace-asymmetry strand is primarily concerned with capturing the pattern of AuxP ellipsis under T in English (see section 3.1) in ways that capitalize on the asymmetry between the head positions of the elided category and its antecedent (Warner 1993, Lasnik 1995, 1997, Potsdam 1997, Roberts 1998, Merchant 2015, Thoms 2015). On this approach, (24) is ungrammatical because a verbal trace cannot be the antecedent of an elided verb (Potsdam, Roberts) (unless the latter is an identical verbal trace, for Potsdam); or because auxiliary verbs are inserted fully inflected and ellipsis requires strict inflectional identity (Lasnik); or because a variable (like a verbal trace) cannot provide an antecedent for a non-variable (Thoms).

(24) \* John was<sub>i</sub> [~~was<sub>i</sub>~~ here], and Mary will [~~be here~~] too.

While these different proposals offer genuine insights into the restrictions on AuxP ellipsis under T, they cannot provide an answer to our central problem: What rules out VSVPE? The problem is fundamental. If the conclusions of Landau to appear are correct, VSVPE is not a possible derivation, *regardless* of matching considerations. Even when both the antecedent and the elided heads are traces of identical verbs (both are variables), VSVPE fails. It fails *before* parallelism constraints are consulted. In that respect, the challenge of explaining the failure of VSVPE is quite unlike the challenge of explaining what deviations from strict identity are permitted and what deviations are not in AuxP ellipsis under T.

Consider next the PF bleeding strand. On this approach, the incompatibility of head movement (or certain kinds of it) and ellipsis reflects a bleeding relation: Ellipsis is said to remove the feature that normally triggers certain types of head movement. While this was originally conceived as a syntax-PF interaction (Lasnik 1999a,b, 2001, Merchant 2001, van Craenenbroeck and Lipták 2008), the growing consensus on the PF-deletion account of ellipsis implied that the entire interaction is internal to PF. Specifically, it has been proposed that head movement applies at PF after ellipsis does, so that the latter destroys the structural context needed for the former: Having been deleted with its maximal projection XP, the head X can no longer move (Boeckx and Stepanović 2001, Hein 2018). A related proposal (Messick and Thoms 2016) assumes that ellipsis bleeds any movement that is "motivated by PF-conditions". A centerpiece argument in favor of the PF-view of head movement out of ellipsis sites is the alleged Verb Identity Requirement: Unlike

syntactic movement, which generated traces accessible to rebinding by a new antecedent in the ellipsis clause, PF movement does not yield any syntactic variable. As far as LF is concerned, then, it is as if PF-movement never applied, and the extracted verb is expected to fully reconstruct, ruling out any mismatch with the antecedent verb.

This line of thought, however, fails to provide a coherent account for the empirical pattern in (8)-(9). If ellipsis bleeds head movement in matrix sluicing (by removing a PF-offending feature), why does it permit head movement in AuxP or polarity ellipsis?

A different but no less fundamental issue concerns the nature of head movement. In fact, head movement has demonstrable scope effects (Lechner 2006, 2017, Iatridou and Zeijlstra 2013, Keine and Bhatt 2016, Sato and Maeda 2017), which require it to occur at least early enough to feed LF – hence, not at PF. It is also well-known that T-to-C movement alters the licensing environment for positive and negative polarity items.

- (25) a. Someone isn't listening to me.  
b. \* Isn't someone listening to me?

- (26) a. \* Why did anyone not help her?  
b. Why didn't anyone help her?

Similarly, a modal preceding a frequency adverb can take scope below it, indicating reconstruction to a lower position (Lechner 2006); However, once it has undergone T-to-C movement, it must take wider scope (explaining the oddity of (27b)).

- (27) a. He can always be wrong.  
[*always* >>  $\diamond$ ]  
b. Can he always be wrong?  
[ $\diamond$  >> *always*]

Such facts are particularly challenging for the claim that ellipsis bleeds T-to-C movement. For this to be possible, it is not enough for T-to-C movement to be "motivated by a PF condition"; it must *occur* at PF. If T-to-C movement is syntactic, a PF operation like ellipsis simply cannot bleed it, applying, as it were, too late. On the other hand, if T-to-C movement does apply at PF, it should leave no mark on interpretation or LF-licensing, contrary to the evidence in (25)-(27) and in the cited works.<sup>21</sup>

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<sup>21</sup> In fact, it is not clear that Messik & Thoms' (2016) proposal for the PF-interaction of T-to-C movement and sluicing is consistent with their (well-supported) claim, following Hartman 2011, that T-to-C movement creates operator-variable chains that affect the LF parallelism condition on ellipsis. Recent skepticism towards the scope effects of head movement (Hall 2015, McCloskey 2016) does not cover the entire range of evidence, and has been addressed by Lechner (2017), who offers still more arguments that head movement is semantically active. In section 5.1, I discuss how V-raising can sometimes create a "headless" VP, which is subsequently fronted. This feeding relation requires head movement to be syntactic too.

The second pillar on which the PF-view of head movement rests – the Verb Identity Requirement – is by now seriously undermined. Despite initial claims to the contrary, verb-stranding ellipsis constructions allow mismatch between the antecedent and the target verbs if they form a natural contrast; this is true for both clausal (polarity) ellipsis and for subclausal ellipsis (allegedly targeting VP, but in fact an instance of argument ellipsis).<sup>22</sup> In fact, Irish is the only languages left in which the Verb Identity Requirement *unquestionably* holds without exception. While further investigation is needed to uncover the roots of this language-particular constraint, no far-reaching conclusions about the nature of head movement are warranted.<sup>23</sup>

A syntactic version of the bleeding account has been defended by Sailor (2018). Following Aelbrecht's (2010) derivational account of ellipsis licensing, Sailor assumes that once ellipsis is triggered, the material inside the elided constituent becomes syntactically inaccessible. Thus, if the trigger for V-raising is merged *after* the licenser of ellipsis, the verb will be "trapped" inside the elided constituent, giving rise to the bleeding scenario. Indeed, this situation arises in mainland Scandinavian languages, as Sailor shows. In these languages, as in English, T licenses VP ellipsis and V-to-C movement applies in V2 clauses, but there is no independent V-to-T movement. Thus, the trigger for V-raising (matrix C) is merged after the trigger for ellipsis (T). Predictably, VSVPE is not attested. Sailor uses this argument to counter Lipták and Saab (2014), who explicitly claim that  $X^0$ -raising and XP ellipsis are jointly sufficient for X-stranding XP-ellipsis in any given language.

While I share Sailor's (2018) view that head movement is syntactic, and his modification may well be necessary, it cannot explain the facts under discussion. The reason is that in case the ellipsis-licenser and the head-attractor happen to be one and the same head, Sailor's analysis predicts that head-stranding ellipsis will be grammatical (presumably, operations triggered by the same head are not ordered). In languages like Hebrew, Portuguese and Russian, this rules in VSVPE, the relevant head being T or Asp. However, if such a construction does not in fact exist in these languages (Landau to appear), Sailor's system overgenerates. There is still a missing constraint: Even when XP-ellipsis exists,  $X^0$ -raising exists, and the attractor of  $X^0$  is not merged after the licenser of XP-ellipsis is, X-stranding XP-ellipsis may still be impossible.

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<sup>22</sup> Verbal mismatch is documented in many languages, among them Serbo-Croatian (Lasnik 1997), Swahili (Ngonyani 1998), Hebrew (Doron 1999, Landau 2018), Portuguese (Santos 2009), Malayalam, Bangla and Hindi (Simpson, Choudhury and Menon 2013), Scottish Gaelic (Thoms 2015), Russian (Gribanova 2017), Greek (Merchant 2018), Finnish (Gribanova 2018) and Hungarian (Lipták 2019).

<sup>23</sup> Expanding on Harizanov and Gribanova 2019, Gribanova (2017) develops a dual theory: *Syntactic* head movement is nonlocal, leaves a variable, has interpretive effects and licenses verbal mismatch in ellipsis; *phonological* head movement is local, leaves no variable, has no interpretive effects, and forces verbal matching in ellipsis. As the two can be combined in the same derivation (e.g., in Russian), intricate conditions must guarantee that all the different pieces of the head (root, Asp, T, Pol) are pronounced as a unit. It is not entirely clear to me what the crosslinguistic predictions of this dual analysis are, so I will not try to compare it with the present proposal.

It is fair to say that the split between admissible and inadmissible configurations of head-stranding ellipsis in the grammar goes beyond the explanatory reach of existing proposals. The lacuna is filled by the CHSE, proposed in section 2.

(28) *Constraint on Head-Stranding Ellipsis (CHSE)*

If  $X^0$ -movement crosses a spellout domain, XP cannot be the target of ellipsis.

Together with the cyclic notion of PF-visibility (29) and a head-based theory of ellipsis licensing (dispensing with the sisterhood relation), this constraint correctly predicts where head-stranding ellipsis will be possible and where it will not.

(29) *PF-visibility of [E]*

The host of [E] must be PF-visible in its spellout domain.

Obviously, the credibility of (29) will increase in proportion to the range of other facts it can successfully explain. In the next section I explore two other empirical domains in which head-based PF-visibility is critically important.

## 5 Headless ellipsis meets headless copies and fragments

It is tempting to relate the "No headless ellipsis" (partial) generalization to two other generalizations: "No headless movement" (first formulated in Takano 2000),<sup>24</sup> and "no headless reprise fragments" (Griffiths, Güncş and Lipták 2018). In this section I discuss these in turn.

### 5.1 Restricting headless movement

The PF-visibility condition (29) implies that what goes wrong with certain head-stranding ellipsis derivations is the fact that XP is "headless" in the relevant sense. Recall that this was the intuition behind Lasnik's (1999b) generalization (3); Lasnik discarded it in the face of VSVPE, but we now have removed this objection (assuming VSVPE does not exist). Permitted instances of X-stranding XP-ellipsis exploit the "visibility window" afforded within a given spellout domain.

Consider the following three examples of illicit headless movement. In English, a VP-shell cannot be fronted after its head has undergone V-to-v movement (Jackendoff 1990). In French, an NP introduced by a numeral cannot undergo A-movement after its nominal head has cliticized to v-T. And in Scottish Gaelic, a vP cannot be fronted after V-to-T-to-

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<sup>24</sup> Indeed, Funakoshi (2012) is explicitly concerned with unifying the constraints on headless ellipsis and headless movement. While I think the project is well worth pursuing, Funakoshi's argumentation is problematic, for reasons to be discussed below. I also return to the challenge of apparent instances of headless movement.



Fin movement. Importantly, movement of the *headed* constituents (i.e., when their head stays *in-situ*) is possible in all these constructions.<sup>25</sup>

- (30) a. \* [VP The book  $t_i$  to Mary] $_j$ , John gave $_{i-v}$   $t_j$ .
- b. *French* (Boivin 2005)  
 \* [NP Trois  $t_i$ ] $_j$  en $_i$  ont été publiés  $t_j$ .  
 three of.them have been published  
 ('Three of them have been published.')
- c. *Scottish Gaelic* (Thoms 2014)  
 \* 'S ann [VP/VP  $t_i$  leabharaichean bho Fheargais] $_j$  a fhuair $_i$  Se`onag  $t_j$ .  
 COP.PRES EXPL books from Fergus.DAT COMP get.PST.IND Se`onag  
 ('What Se`onag did was get books from Fergus')

Let us compare, side by side, the violations of headless ellipsis and headless movement (we will return below to legitimate instantiations of these processes).

- (31) a. *Headless ellipsis*  
 [YP (ZP) [Y' [Y X $_i$  Y] [XP  $t_i$  [WP ... ] ] ] ]
- b. *Headless movement*  
 [ [XP  $t_i$  [WP ... ]] $_j$  ... [YP [Y X $_i$  Y] [XP  $t_i$  [WP ... ]] $_j$  ] ]

To unify these cases, Funakoshi (2012) adopts Johnson's (2001) proposal that VPE reduces to VP fronting, followed by "topic-drop" of the fronted VP. VP fronting, in turn, is blocked if V raised out of VP by adjunction to the next higher head (e.g., T). The reason is that this raised V counts as equally local to the probe (say, a Top head), thus intervening for VP fronting. V, already part of the V-T complex head, cannot be fronted itself, however, due to the ban on excorporation. The result is ungrammaticality.

This analysis is problematic in a number of respects. The very reduction of VPE to VP fronting is questionable, as their distribution is quite different (Aelbrecht and Haegeman 2012). In any event, the reduction has never been seriously substantiated for non-VP cases (e.g., NP-ellipsis), which we would also like to fall under the unification. Further aspects of Funakoshi's proposal, especially the hypothetical distinction between head-substitution and head-adjunction, along with its crosslinguistic consequences, are critiqued in Vicente 2015.

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<sup>25</sup> Takano's (2000) original English example used clefting, but as Funakoshi (2012) observed, even headed VPs resist clefting in English. In Scottish Gaelic, however, in periphrastic verbal constructions, the auxiliary satisfies the V1 requirement and the headed vP can be clefted (McCloskey 2011 presents a similar contrast with TP fronting in Irish). The French examples were discussed early on (see Ruwet 1972, Kayne 1975, Rizzi 1990). The basic challenge was to account for the contrast between partitive *en*-cliticization, which produces a frontable remnant, and quantitative *en*-cliticization, which produces ungrammaticality under remnant fronting, as in (30b). I follow the standard assumption that the former clitic is a complement but the latter is the nominal head. Note that the numeral, which could be phrasal, occupies a specifier position.

Instead, let us pursue the idea expressed in the PF-visibility condition for [E] (29), now abstracting away from the differences between ellipsis and movement and focusing on their shared core. This core, as Chomsky (1995: 253) points out, seems to be the instruction to PF not to pronounce a certain constituent – an ellipsis site, or a non-topmost copy in a chain. Let us call this feature  $[S\uparrow]$ , where "S" stands for silence and " $\uparrow$ " indicates that the instruction applies to the maximal projection of the host head.

(32) *Silencing at PF*

- a.  $X_{[S\uparrow]}$  is visible at PF  $\rightarrow$  XP is unpronounced
- b. XP is elided  $\rightarrow X_{[S\uparrow]}$
- c. XP is a non-topmost chain copy  $\rightarrow X_{[S\uparrow]}$

(32b) is just the silencing instruction of ellipsis, factored out of Merchant's [E] feature. (32c) is just the silencing instruction for (normally) non-topmost chain copies, needed on any theory that negotiates chains at the syntax-PF interface.<sup>26</sup> Together with (32a), this system embodies that claim that ellipsis and chain reduction recruit the very same elementary PF silencing operation. And precisely because this operation is subject to PF-visibility – the head responsible for silencing must itself be visible to PF in order for  $[S\uparrow]$  to be detected – both processes display "headless" effects. Thus, the desired unification of (31a) and (31b) is achieved.<sup>27</sup>

The idea that copy deletion and ellipsis recruit the same PF operation is not only conceptually appealing, but also empirically advantageous. It is an old observation that both movement and ellipsis gaps block contraction of a preceding auxiliary (King 1970). The two contexts are unified if silencing by  $[S\uparrow]$  produces a prosodic boundary, an obstacle to proclisis of the contracted auxiliary (Wilder 1997).

- (33) a. Bill's proud of his daughter, Mary is/\*'s \_\_\_ of her son.  
 b. How proud do you think Mary is/\*'s \_\_\_ of her son?

Furthermore, as Bošković (2011) argues convincingly, the familiar rescue-by-PF-deletion effect that ellipsis has on island violations (Ross 1969, Merchant 2001, Fox and Lasnik 2003) can be fruitfully extended to cases where traces of movement or null arguments fail to trigger Relativized Minimality effects. Bošković proposes that the "violation mark" is operative at PF, so that removing it removes the violation. The fact that both traces and ellipsis sites have the same rescuing effect supports the idea that they involve the same silencing instruction at PF.

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<sup>26</sup> For head chains,  $[S\uparrow]$  would have to be replaced with  $[S]$ , that is, a nonprojecting silencing instruction. The distinction between head and phrasal movement is independently needed and so this choice would have to follow from it.

<sup>27</sup> Note that this unification, if successful, would indirectly support eliminating the sisterhood relation from the licensing of ellipsis (see (14)): Deletion of copies in an XP-chain is not triggered by the sister head of XP (which may not even have a sister head, for example, when XP is a specifier or adjunct), so it should not be so triggered in ellipsis, being one and the same deletion operation.

This account throws new light on a broad range of cases that I have termed "EPP extensions" in Landau 2007. This work develops a view of a generalized EPP as "selection at PF": a head-head relation that requires PF-visibility in certain specifier positions (usually, [Spec,TP] or [Spec,TopP]). Interestingly, the requirement is imposed on the *head* of the specifier, with the result that headless phrases, which nonetheless contain overt material, fail to meet it. Under this conception, it is possible to unify constraints against complementizer-less subject clauses, constraints against bare noun subjects (i.e., with a null D) in Romance languages, freezing effects with applied objects, and the curious requirement that initial adjuncts be introduced by an otherwise optional preposition (so-called "bare NP adverbs"), as in (34) (see Landau 2007 for further crosslinguistic evidence and some nuances).

- (34) a. They slept (for) an hour and then went to work.  
 b. \*(For) an hour, they slept, and then went to work.  
 c. She has lived (in) few places with so much sunlight.  
 d. \*(In) few places with so much sunlight has she lived.

The crucial factor that unifies all these impossible constructions, I claimed, was the inability of a headless constituent to satisfy an EPP requirement imposed in the *target* position. The present proposal, however, suggests a different perspective: Headless phrases cannot move not because their top copy incurs a violation in the target position, but rather because their foot copy incurs a violation in the *base* position. That is, the silencing instruction cannot be executed on the foot copy, as its head is not PF-visible.

Finally, I would like to address exceptions to Takano's (2000) generalization, namely, cases where headless movement has been claimed to occur. On the present analysis, the first type of "exception" is, in fact, not an exception at all. Funakoshi (2012) presents verb doubling in predicate cleft/VP-topicalization across many languages as a grammatical instance of headless movement: V raises to T and subsequently VP is fronted.

(35) *Hebrew* (Landau 2006)

**lištof**, hu kvar **šataf** et ha-kelim.  
 to.wash he already washed ACC the-dishes.  
 'As for washing, he already washed the dishes.'

However, the fact that the fronted VP is headed by an *overt* copy of the base verb (in some default morphological form, see Landau 2006 for details) classifies this construction as *headed* movement, at least on the present terms. Indeed, Takano's and Funakoshi's analyses are based on syntactic feature checking, which is somehow impeded by head traces or head intervention. Under the present proposal, in contrast, the headedness required in (32) concerns PF-visibility. The parametric option of V-doubling, then, enables the grammar to

overcome the crippling effect head movement has on the movability of the remnant, by preserving the visibility of its head.<sup>28</sup>

Consider next the often-discussed case of German, which, in fact, displays mixed evidence for headless vP-fronting. For instance, ditransitive examples are cited sometimes as grammatical (36a) (from Fanselow 1993) and sometimes as ungrammatical (36b) (from Haider 1990).<sup>29</sup>

- (36) a. [vP Der Maria einen Ring t<sub>i</sub> ]<sub>j</sub> glaube ich nicht,  
           the Maria a ring believes I not  
           dass er je t<sub>j</sub> schenken<sub>i</sub>-T wird.  
           that he ever give will  
           ‘I don’t think that he would ever give Maria a ring.’
- b. \* [vP Ihr ein Buch t<sub>i</sub> ]<sub>j</sub> gab<sub>i</sub>-T-C Hans t<sub>j</sub>.  
           her a book gave Hans  
           ‘Hans gave her a book.’

In discussions of headless vP fronting in German, the following factors have been mentioned as relevant to the overall acceptability of the construction: whether the two objects appear in their unmarked order, whether they are indefinite or plural, the phonological length of the arguments, whether the particle (in verb-particle constructions) is transparently predicative or idiomatic, whether case marking is overt, and possibly other factors. However, the generality of these criteria is far from evident (see Vicente 2015, S. Müller 2017).

It seems fair to say that we currently lack a systematic understanding of headless vP fronting in German. Still, the gradual accumulation of acceptable examples over the years has made it clear that the construction is available, in principle (S. Müller (2017) has collected over 3,200 attested examples of "multiple fronting", involving combinations of two objects, object and particle, object and adverb, and so on). It is also not controversial that the fronted category is vP; indeed, there is evidence that both the external argument (when indefinite) and left-edge adverbs can be carried along with the fronted constituent. As we will shortly see, the fact that it is vP rather than VP that is fronted will make this case, too, unproblematic.

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<sup>28</sup> See Arano 2018 for an account similar in spirit to V-doubling as a "repair strategy" to a linearization failure. Funakoshi's broader typological claim is that only languages permitting multiple specifiers instantiate headless movement and ellipsis. Hebrew is supposed to be one such language, displaying V-doubling VP-fronting and VSVPE, because, presumably, it also has multiple specifiers (Doron and Heycock 1999). But nothing in this description is correct. VSVPE does not exist in Hebrew (Landau 2018), V-doubling VP-fronting is, strictly speaking, not "headless" movement, and multiple specifiers also do not exist in the language (rather, left dislocation does, which has been misanalysed; Landau 2009, 2011). See Vicente 2015 for further obstacles to Funakoshi's typological claim.

<sup>29</sup> See Haider 1990, Fanselow 1993, G. Müller 1998, 2004, Wurmbrand 2004, Bildhauer and Cook 2010, S. Müller 2017.

Two other instances of headless movement have been proposed for Japanese (Kuwabara 1996, Koizumi 2000) and Lokaa (Baker 2005). Clefting in Japanese can target a wide range of "surprising constituents", consisting of a sequence of XPs excluding the verb (37a). In Lokaa, the canonical head-first order of the VP is inverted to head-final order in negative and gerundive clauses (37b).

- (37) a. Mary-ni ageta<sub>i</sub> no wa [John-ga hon-o t<sub>i</sub>] da.  
 Mary-DAT gave NMZ TOP John-NOM book-ACC is  
 'It is John a book that gave to Mary.'
- b. Úbì [ t<sub>i</sub> lì-póó ká' ẽ̀-pla]<sub>j</sub> òó-kpèyì<sub>i</sub> t<sub>j</sub>.  
 Ubi 14-cup in market NEG/1.AGR-sell  
 'Ubi didn't sell cups in the market.'

In (37a), Kuwabara and Koizumi maintain, V-to-T-to-C movement applies, as well as scrambling of the dative object above the subject. The remnant TP – consisting of the subject and the direct object only – is then moved to the cleft position.<sup>30</sup> In (37b), according to Baker, V-to-Infl raising is followed by headless VP-fronting to the specifier of a Mod(ality) head, which projects above InFLP. The analysis of the Lokaa construction seems to be well-supported by language-internal evidence. The proper characterization of the Japanese construction, however, is far from clear; Takano (2002) points out a number of nontrivial difficulties with the headless movement account.

All and all, the empirical picture can be described as follows: English, French and Scottish Gaelic display clear cases of impossible headless movement. Lokaa displays a clear case of possible headless movement. German appears to allow the construction, although open questions remain. And the nature of the construction in Japanese (which affects both VPs and TPs) remains undecided.<sup>31</sup>

Why is headless movement selective in this way? An appealing possibility is to model the split in the realm of headless movement on the one in the realm of headless ellipsis (see (8)-(9)). In particular, one may capitalize on the qualification "within its spellout domain" in (29), now replacing [E] with [S↑], the shared silencing feature responsible for both ellipsis and copy deletion.

- (38) *PF-visibility of [S↑]*  
 The host of [S↑] must be PF-visible in its spellout domain.

<sup>30</sup> Or movement may apply to a duplicate of the focused constituent inside the topicalized clause, which is subsequently deleted under identity with the focus. The details do not matter as both implementations invoke headless TP movement.

<sup>31</sup> Note that the very existence of headless movement implies, contrary to Hein 2017: fn. 12, that head movement cannot be postsyntactic, for then it would not be able to feed the fronting of the remnant headless constituent (NP, VP or TP), a syntactic operation. Arano (2018) argues that headless VPs may only be fronted in OV languages but not in VO languages, a consequence he derives from the cyclic linearization model of Fox and Pesetsky 2005. However, Lokaa is clearly VO and yet allows the construction.

Parallel to the CHSE, repeated in (39), there would be a *Constraint on Head-Stranding Movement (CHSM)* (40), crucially sensitive to spellout domains.

- (39) *Constraint on Head-Stranding Ellipsis (CHSE)*  
If  $X^0$ -movement crosses a spellout domain, XP cannot be the target of ellipsis.
- (40) *Constraint on Head-Stranding Movement (CHSM)*  
If  $X^0$ -movement crosses a spellout domain, XP cannot be the target of movement.

For (40) to successfully exclude impossible headless movement, we will need to assume that both the English (30a) and Scottish Gaelic (30c) constructions involve VP-fronting, rather than vP-fronting (trivially true of English), and that NP is a spellout domain, at least in French (30b), a natural consequence of the common assumption that DPs are phases. To rule in German (36a) and Lokaa (37b), we will need to assume that the fronted category is a vP, not a VP; this is well-established for German, and as yet unknown for Lokaa. These distinctions guarantee that the stranded head in the ungrammatical cases crosses a spellout domain, in violation of (40), but the one in the grammatical cases does not.<sup>32</sup> Evidently, headless movement needs to be documented more extensively before one can draw any firmer conclusions, but the current state of knowledge is encouraging and seems to support the relevance of phase-based PF-visibility to this phenomenon.<sup>33</sup>

## 5.2 Restricting headless reprise fragments

I will conclude with another context where "headlessness" appears to disrupt the proper flow of information from syntax to PF. Reprise fragments (RFs) are nonsentential questions that repeat a phrase, word or morpheme from the most recent utterance. The repeated unit is either focused itself or contains a focused element (Griffiths, Güncş and Lipták 2018, henceforth GGL). In the examples below, italics represent pitch accent.

- (41) a. A: John's bought a red car.  
B: A *red* car?

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<sup>32</sup> Thus, ellipsis and movement of verbal projections will be licensed when [ $S\uparrow$ ] is hosted on v but barred when it is hosted on V. Note that the fact that the moved XP crosses a spellout domain is irrelevant to the evaluation of (40); only the path of  $X^0$  matters.

<sup>33</sup> Independent support for the general approach advocated here might come from an intriguing effect discussed by Bošković 2005, 2011: XP islands lose their islandhood upon  $X^0$ -movement. Bošković suggests that island violations are registered on the *head* of the island, and that copy deletion of the trace of  $X^0$  deletes the "violation mark" – another instance of rescue by PF-deletion. An alternative perspective, more in line with (38), is to assume that what the head of an XP island registers is the very islandhood property – call it an [I] feature – and that this feature is no longer PF-visible on  $X^0$ 's trace. Thus, a headless XP is not an island to begin with. Note that  $X^0$  might still carry [I] to its landing site, but given that it does not project there, the island would not reemerge.

b. A: Sally saw the man that fell with her binoculars.

B: With her *binoculars*?

c. A: Is John a neurophysiologist?

B: *Neuro*?

On the basis of previous studies and their own original data, GGL show convincingly that RFs are derived by ellipsis of all of the sentential material surrounding the pronounced fragment. Importantly, they also demonstrate that at least in English, RFs are *not* derived by movement + ellipsis (as in sluicing or fragment answers, Merchant 2001, 2004); rather, they are derived by discontinuous ellipsis around the *in-situ* RF. I will not go through their evidence but simply assume this conclusion in what follows.<sup>34</sup>

The RF must contain a focused element, but other than that, it is pretty much unrestricted.

(42) A: John spoke to the man that Pete introduced to Dracula.

B: WHO?

B: introduced to WHO?

B: that Pete introduced to WHO?

B: the man that Pete introduced to WHO?

B: to the man that Pete introduced to WHO?

B: spoke to the man that Pete introduced to WHO?

There is, however, one intriguing restriction. GGL observe that headless constituents – that is, constituents headed by a trace – make bad RFs.

(43) a. A: John has given a vampire some garlic.

B: [<sub>VP</sub> given-v [<sub>VP</sub> a vampire [<sub>V'</sub> t<sub>V</sub> some GARLIC]]] ?

B': \* [<sub>VP</sub> a vampire [<sub>V'</sub> t<sub>V</sub> some GARLIC]] ?

b. A: Did Bo finagle a raise?

B: [<sub>VP</sub> FINAGLE a raise] ?

B': \* [<sub>TP</sub> Bo t<sub>did</sub> FINAGLE a raise] ?

Note that the excluded targets for RF formation are precisely the excluded targets for X-stranding XP-ellipsis: a VP under v headed by a trace and a TP under C headed by a trace, cases (10a-b). In both structures, head movement crosses a spellout domain. This crucially blocks ellipsis due to the CHSE, (39); the question is why it also blocks RF formation.

It seems intuitively clear that RF formation should fall under the jurisdiction of PF no less than ellipsis, as the two closely interact. In fact, RF is just the result of sentential ellipsis

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<sup>34</sup> On the other hand, Hungarian RFs *are* derived by movement + ellipsis (e.g., their island-sensitivity). GGL do not discuss whether headlessness effects show up in Hungarian RFs, but if they do, they may reduce to the CHSM in (40), operating on the foot copy of the moved RF.

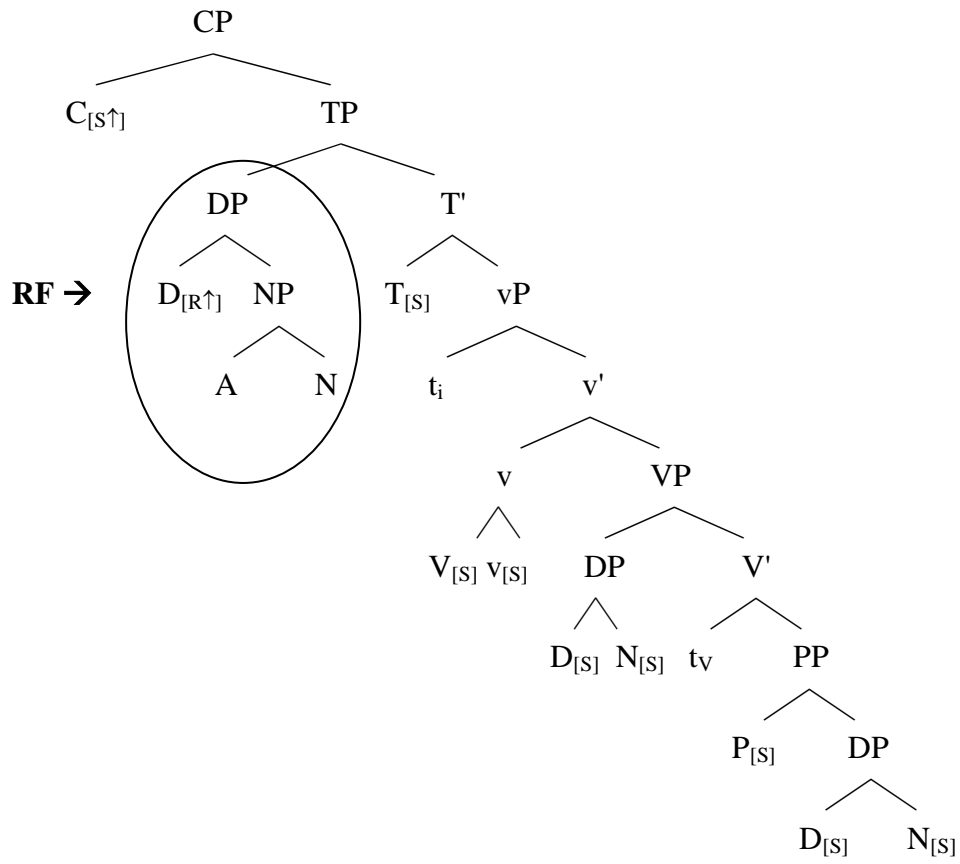
*failing* to apply to one constituent within the sentence. If the silencing instruction [ $S\uparrow$ ] operates at PF, it must be the case that whatever prevents it from applying to the RF (inside a bigger constituent to which it *does* apply) should likewise be a PF-visible instruction.

There are a number of possible executions at this point, all compatible with these ideas. I will sketch one, noting that the ultimate theory of the syntax-PF interface is very much an open research topic. The guiding principle behind this account is the idea that there is no designated "Pronounce!" feature. Rather, spellout of syntactic tress is the default, which yields to non-pronunciation only under the duress of [ $S\uparrow$ ]. By this logic, the RF is exempted from ellipsis – and hence, obligatorily pronounced – thanks to some device that shields it from the effect of [ $S\uparrow$ ].

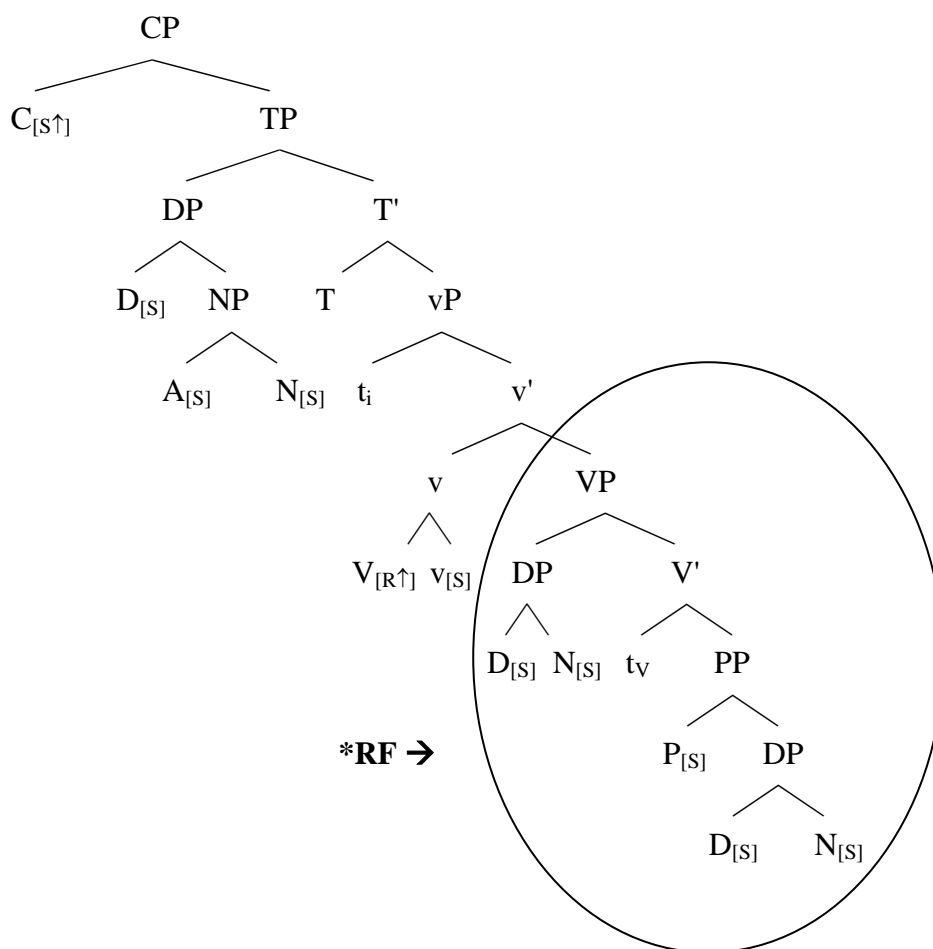
Although this is rarely discussed in the ellipsis literature, the silencing feature – be it [E] or [ $S\uparrow$ ] – cannot simply remain at the nonterminal node where it is licensed. This is because morphological spellout rules operate on *terminal* nodes. Thus, if a head X carries [ $S\uparrow$ ], all terminal nodes dominated by XP must inherit [S] (= "Don't pronounce me!") one way or another, so as to block Vocabulary Insertion under them. We can then envision the feature generating RFs, call it [R], as a shield on X that deactivates the inheritance of [S]. Parallel to [S] and [ $S\uparrow$ ], we can distinguish between [R], which shields its host X from silencing, and [ $R\uparrow$ ], which projects from X to XP and shields all terminal nodes dominated by XP from silencing.



(44) *Successful RF formation (RF = Subject)*



(45) *Failed RF formation (RF = headless VP)*



In the successful derivation (44), the subject DP is marked with  $[R\hat{\uparrow}]$ . This feature shields the terminal nodes under this DP – D, A and N – from inheriting the silencing feature  $[S]$  that propagates throughout the CP from its  $C_{[S\hat{\uparrow}]}$  head. Consequently, all terminal nodes in the CP except those belonging to the subject DP are elided.

In the failed derivation (45), V carries  $[R\hat{\uparrow}]$ , which normally would spare the entire VP from ellipsis. However, V-to-v raising carries that feature outside its spellout domain, namely VP. In this situation, just as with VSVPE, features on the head of the verbal chain are not PF-visible on its foot. Not being PF-visible at the VP level,  $[R\hat{\uparrow}]$  fails to shield VP from  $[S]$ -inheritance, resulting in full-blown ellipsis. Thus, although the functions of  $[S\hat{\uparrow}]$  in VSVPE and  $[R\hat{\uparrow}]$  in VP reprise fragments are opposite – one regulates ellipsis, the other regulates exemption from ellipsis – the grammar constrains their effects in identical ways, both reducing to the cyclic logic of PF visibility.

Admittedly, this account should be further fleshed out as we learn more about these phenomena. One issue that certainly calls for further analysis is the nature of  $[R\hat{\uparrow}]$  – so far a rather abstract feature. As it stands, nothing connects it to the most salient property of

RFs – namely, the fact that they contain an F(ocus)-marked constituent. Unlike GGL's analysis, which is based on focus projection via the head, the present proposal keeps  $[R\uparrow]$  independent of F-marking. There are two reasons for this decision. First, as Büring (2006) has shown, focus projection to XP need not pass through its head  $X^0$ , and in fact, that head may undergo ellipsis when it is discourse-given. Second, while F-marking tracks the current focus (by answering the current QUD), projection of  $[R\uparrow]$  does not seem to carry any interpretive import. The different choices of RF in (42) all seem to address the same QUD (namely, *Who was the X such that John spoke to the man that Pete introduced to X?*). In that respect,  $[R\uparrow]$  projects more like the *wh*-feature does in pied-piped XPs (where different pied-piping options do not correlate with different QUDs).

No doubt, further research will shed more light on RFs and their relation to focus, pied-piping, and ellipsis. Yet it is already evident that the striking parallelism between movement, ellipsis and RF formation with respect to headlessness effects points to an underlying unity of mechanism.

## 6 Conclusion

From a crosslinguistic perspective, the interaction of ellipsis and head movement poses fascinating challenges to theories that address both processes. Recurring lacunas demand our attention: Why can T-to-C movement not cooccur with TP ellipsis? Why can V-to-v-to-T movement not cooccur with vP ellipsis? Why can V-to-v movement not cooccur with VP ellipsis? Unselective responses, such as the common "bleeding" account, fail to explain why other instances of head-stranding ellipsis are acceptable (Aux-to-T movement cooccurs with AuxP-ellipsis, To-to-Pol movement cooccurs with TP-ellipsis). These are theoretical lacunas insofar as robust evidence suggests that the ingredients needed for each derivation are in place, yet their cooccurrence is unattested.

The structural distinction between attested and unattested cases of head-stranding ellipsis turns out to be whether or not the head of the elided XP crosses a spellout domain. When it does, ellipsis is bled. To understand this restriction, I have introduced the notion of "PF-visibility", which is relevant to all PF-operations, including ellipsis. Once the head of a to-be-elided XP is separated from the XP by a spellout domain, the silencing instruction cannot be executed. This account requires an adjustment in the Merchant/Aelbrecht theory of ellipsis licensing (advantageous on conceptual grounds as well): the silencing feature is hosted on the *head* of the elided XP, not on its sister.

In the final sections of the article, I have argued that PF-visibility of heads is crucial in explaining a host of other ECP/EPP-type effects; thus, it is not a quirk of head-stranding ellipsis. It should be stressed that the paramount role of heads is taken for granted in considering the syntactic and semantic properties of their projections; for example, an NP is case-marked or animate if its head noun is. PF-visibility is just the analogue at the PF interface: properties of XP as a whole that are relevant to PF must be encoded on X.

Finally, this idea was applied to headless movement and headless reprise fragments. To the extent that freezing effects are found with XPs that have lost their head, they can be profitably united with the ban on headless ellipsis. This would reflect a shared, underlying operation of PF-deletion, recruited for copy deletion and ellipsis alike. Similarly, to the extent that the same headless constituents cannot surface as RFs, a "mirror-image" effect of ellipsis-*bleeding* can be tied to PF-visibility of moved heads. Hopefully, "headlessness effects" traceable to PF-visibility extend even further into the syntax-PF interface, a topic I leave for future research.

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