

WHAT IS ELIDED IN ENGLISH ν_b P ELLIPSIS, AND WHEN?

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1 Introduction

Since the inception of transformational generative grammar, ellipsis has been one of the most actively discussed topics in this field. Nonetheless, there is no consensus on when and where ellipsis occurs. Merchant (2001) and Lasnik (2001a) suggest that the sound of lexical items is deleted at Phonological Form. Meanwhile, Chung et al. (1995) propose that ellipsis is an LF-copying operation. Recently, a school of thought has emerged suggesting that ellipsis is a failure of vocabulary insertion at Phonological Form, which is caused by particular operations occurring in overt syntax. Aelbrecht (2010) proposes that an E-feature on the head that selects the elided XP establishes an Agree relation with a licenser. Then, the ellipsis site is sent to Phonological Form, and vocabulary insertion of lexical items inside the ellipsis site is inhibited. Baltin (2012) proposes that ellipsis is deletion of formal features, which occurs during the derivation in overt syntax, and thus, bleeds vocabulary insertion at Phonological Form, assuming that vocabulary insertion depends on formal features. According to Aelbrecht's and Baltin's proposals, ellipsis is not deletion of sound.

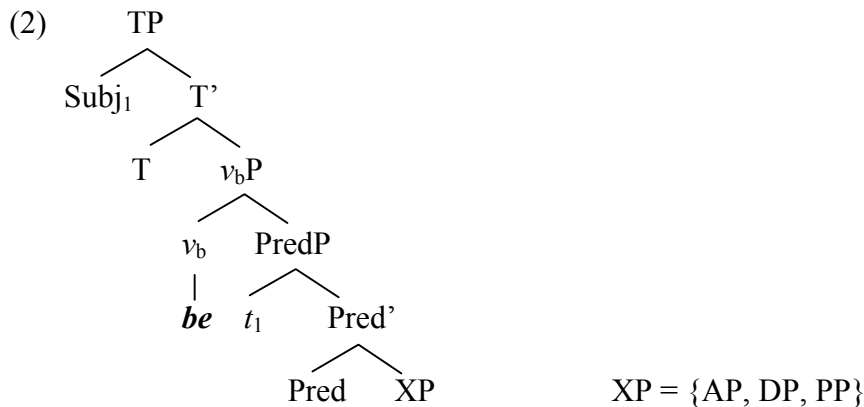
In this paper, I propose that XP ellipsis occurs as soon as all the featural requirements of the licenser of XP ellipsis are satisfied, which entails that ellipsis occurs in narrow syntax. Additionally, I argue that ellipsis is a syntactic operation that gets rid of the phonological feature matrices (PFMs) of lexical items, assuming that every lexical item contains a PFM whose segmental content (i.e. phonological features) is inserted into at PF. I also demonstrate that elements that are deprived of their PFMs can participate in formal operations occurring after ellipsis. However, we will see that *wh*-phrases behave as though they are not eligible for further formal operations after deletion. I discuss why this overgeneration occurs, and I propose a phonological constraint that is able to rule this overgeneration out, adopting and modifying Richards's (2016) Contiguity.

2 English Copular Phrases and Extraction Puzzles

English copular phrase ellipsis can be illustrated in (1).

- (1) a. John should [be fond of this book]₁, and Tom should *e*₁, too.
 b. Mary might [be proud of her teacher]₂, but Jennifer might not *e*₂.

The ellipsis sites in (1) contain the copular verb *be* and the predicate, namely the adjective phrase. In generative grammar, researchers have made several suggestions for the inner structure of copular constructions. In this paper, I assume the structure suggested in Mikkelsen (2005), which is represented in (2). In this structure, the subject of the copular construction is base-generated in the specifier position of the predication phrase (PredP), following Bowers (1993) and Baker (2003). The PredP is selected by the functional head *v*, where the copular verb is base-generated. Mikkelsen calls this little *v* head *v*_b, and assumes that *v*_b is a subtype of unaccusative *v*: the difference between normal *v* and *v*_b is that the former takes a VP complement, while the latter a PredP complement.



When T merges with *v*_bP, the subject obligatorily moves to [Spec,TP] to satisfy the EPP. On the other hand, the copular verb undergoes head movement to T only when there is no auxiliary verb located in T. When T is occupied by another auxiliary verb, the copula does not move to T. This is shown in (3).

- (3) a. John is not fond of his teacher.
 b. John might not be fond of his teacher.

Given that the negation expression *not* is located either in the leftmost position of the highest verbal domain or in NegP (or Σ P) immediately dominating the highest verbal domain, the contrast in (3) indicates that the copula remains inside the verbal domain when the modal is located in T.¹ Based on the discussion above, we can conclude that the ellipsis site in English

¹ A substantial body of work (Bjorkman 2011, Harwood 2015, inter alia) suggests that scope bearing modals are base-generated lower than T, and then move to T. However, in this paper, I assume that modals are base-generated in T, for the sake of explanatory simplicity.

copular phrase ellipsis, exemplified in (1), is v_bP . In this paper, I will call copular phrase ellipsis v_bP ellipsis.

A puzzling property of v_bP ellipsis is the following matrix-embedded clause asymmetry: object *wh*-extraction out of the ellipsis site is allowed when the matrix v_bP is elided, but not when the embedded v_bP is elided. This is illustrated in (4) and (5), respectively.²

- (4) a. What should Bill be proud of, and what should John ~~be proud of~~?
 b. What might Tom not be fond of, and what might he ~~be fond of~~?
- (5) a. ?*I don't know what Bill should be proud of, but I know what John should ~~be proud of~~.
 b. ?*Although I wonder what Tom might not be fond of, I don't wonder what he might ~~be fond of~~.

From the perspective of the Identity condition and MaxElide governing the availability of ellipsis and extraction out of the ellipsis site (Merchant 2001, 2013; Lasnik 2001a; Hartman 2011, Messick and Thoms 2016, *inter alia*), there seems to be no reason the matrix clauses and the embedded clauses exhibit such an extraction asymmetry. The sentences in (4) and (5) would all fare identically with respect to these two conditions.

Another related puzzle is that the extraction asymmetry shown in v_bP ellipsis is not found in regular VPE. That is, extraction out of the ellipsis site is freely allowed in both the matrix clause and the embedded clause in regular VPE, as illustrated in (6).

- (6) a. Who will Bill kiss and who will John? (Messick and Thoms 2016)
 b. I don't know who John won't criticize, but I have a good idea about who he will.

3 When Does Ellipsis Occur?

In order to resolve the extraction puzzles mentioned above, I propose the following constraint on the timing of ellipsis.

- (7) **The timing of ellipsis**
 XP ellipsis occurs as soon as all the featural requirements of the licenser of XP ellipsis are satisfied.

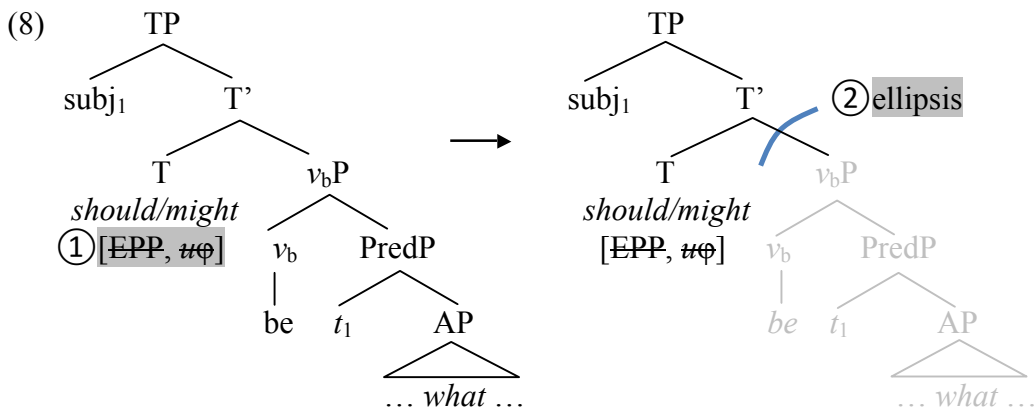
A consequence of (7) is that the point of XP ellipsis can vary depending on the point where all the featural requirements of the licenser of XP ellipsis are satisfied.

This contrasts with existing derivational approaches to ellipsis. Aelbrecht (2010) suggests that ellipsis occurs when the categorial feature on the licenser and the inflectional feature on the head selecting the ellipsis site establish an Agree relation. Assuming that a feature enters into an Agree relation with its matching feature as soon as its matching feature is introduced into the

² I tested these sentences with twelve native speakers of American English. Ten of them report a significant contrast between the sentence like (4) and the sentences like (5) – the former are acceptable, the latter are unacceptable. One informant judges that the sentences like (5) are marginal and the sentences like (4) are totally acceptable. The other informant reports that the sentences like both (4) and (5) are unacceptable.

derivation, ellipsis cannot be delayed under any circumstance. Meanwhile, in Baltin (2012), ellipsis occurs when a head merges with the phrase that deletes, and thus, again, the point of ellipsis cannot change.

The constraint in (7) can account for the unavailability of *wh*-extraction in the sentences in (5) as follows: I assume here that the licenser of verbal domain ellipsis is a c-commanding functional head T, following Lobeck (1995) and Zagana (1988). According to this, the licenser of v_b P ellipsis is a modal base-generated in T. The embedded modals in (5) have two featural requirements, one of which is Agree in ϕ -features, and the other of which is the EPP.³ These requirements are satisfied when the modals are introduced into the derivation. Consequently, this must be when v_b P ellipsis occurs. This is illustrated in (8). At the point of ellipsis, the *wh*-elements fail to be located outside the ellipsis site. As a result, their PFMs (phonological feature matrices) of the *wh*-elements are removed. Due to this, those *wh*-elements do not contain an appropriate place which segmental content is inserted into, when they are sent to PF. Thus, they can never be pronounced. Nonetheless, *wh*-elements are pronounced in (5). This is the reason the sentences in (5) are ungrammatical.

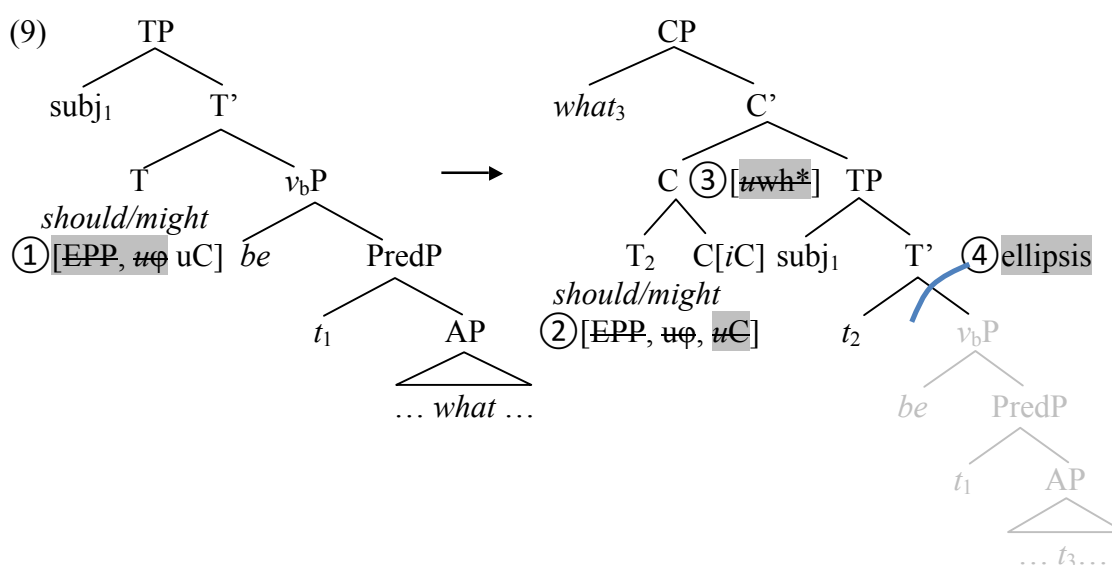


On the other hand, the sentences in (4), where v_b P ellipsis occurs in the matrix clauses, do allow *wh*-extraction out of the ellipsis site. Before explaining why the sentences in (4) are grammatical, let us take a quick detour. One difference between the modals in the matrix clauses in (4) and the modals in the embedded clauses in (5) is that the former undergo T-to-C movement, while the latter do not. Adopting and modifying Lasnik's (1999) head movement system, Harwood (2015) suggests that a moving head contains an uninterpretable feature and it moves to a higher head bearing its matching interpretable feature. As a result of head movement, the uninterpretable feature on the moving head can be deleted. Following them, I assume in this paper that a modal undergoing T-to-C movement contains the uninterpretable feature [u C]. It moves to C containing the [i C]-feature, and then the feature is deleted. On the other hand, if a modal or auxiliary stays in T and does not move to C, it can only be because it did not bear the [u C]-feature.

Now, we are ready to explain why the sentences in (4) allow *wh*-extraction, unlike the sentences in (5). The matrix auxiliary verbs in (4) have one more featural requirement besides what the embedded auxiliary verbs in (5) contain. The additional requirement is the [u C]-feature. Then, the matrix auxiliary verbs in (4) have three featural requirements. These are: Agree in ϕ -

³ In this paper, I assume that the EPP of a functional head is the [u D*] feature that attracts a DP to the specifier position of the functional head (Chomsky 1995, van Urk and Richards 2015), contra Lasnik (2001b).

features, the EPP, and the deletion of the [*u*C]-feature. The first two featural requirements (i.e., Agree in φ -features and the EPP) are satisfied as soon as the modal is introduced into the derivation. At this stage, ellipsis does not occur, because the [*u*C]-feature on T has not been deleted. After C merges with TP and the modal moves to C, deletion of the [*u*C]-feature and internal merge of the *wh*-element to [Spec,CP] occur simultaneously. This is because those two operations are triggered by the features of the same head C. Lastly, *v*_bP is elided. Eliding *v*_bP any sooner (i.e., before tending to all of the featural requirements of C) would violate the principle in (7), above. Since the *wh*-elements in the sentences in (4) are located outside the ellipsis site, namely [Spec,CP], when *v*_bP ellipsis occurs, their PFMs are unaffected, and they can be pronounced outside the ellipsis site. This derivation is represented in (9). A noteworthy aspect of this derivation is that the moved modals can license *v*_bP ellipsis. That is, a modal can license the elision of the phrase that is not its complement in the surface representation, but a complement of a lower copy/position that the modal previously occupied.



If this analysis is on the right track, we can make the following prediction: In *v*_bP ellipsis, subject *wh*-phrase extraction would be possible both in embedded and matrix clauses, and would not show the asymmetry shown above for object *wh*-phrase extraction. This is because subject *wh*-phrases undergo movement to [Spec,TP] in order to satisfy the EPP, and *v*_bP ellipsis must occur after the satisfaction of the EPP on T. Thus, subject *wh*-phrases will be located outside the ellipsis site at the point of ellipsis, whether ellipsis occurs in embedded clauses or matrix clauses. This prediction is borne out, as illustrated in (10).

- (10) a. I don't know who won't be fond of this book, but I know who will.
- b. Who won't be fond of this book, and who will?

The present proposal is also supported by *v*_bP ellipsis in Indian Vernacular English (IVE). According to Bhatt (2010), IVE is a mirror image of Standard English with respect to T-to-C movement in questions. IVE has T-to-C movement in embedded questions, but not in matrix questions. Given that T-to-C movement in IVE occurs in narrow syntax (Hartman 2011), the prediction made by the current analysis is as follows: If the contrast between (4) and (5) is

because of T-to-C movement caused by the [μ C]-feature, IVE should exhibit the opposite asymmetry: it should allow object extraction out of embedded v_b P ellipsis site, but not out of matrix ones. On the other hand, if the contrast in the extractability in Standard English is due to some independent property of matrix versus embedded v_b P ellipsis, then IVE should show the same asymmetry seen in Standard English (cf. (4-5), above). My consultant reports the opposite asymmetry, as illustrated in (11). This shows that the present analysis is right.

- (11) a. Who Mary will be proud of, and who John will *(be proud of)?
 b. Although I wonder what will Mary be proud of, I don't wonder what will John [?](be proud of).

In what follows, I will provide another argument supporting the current analysis. Consider the sentences in (12). The ellipsis site in (12b) is smaller than that in (12a), differing as to whether or not the copula is included in the ellipsis site. In this paper, ellipsis of the type shown in (12b) will be called *predicate ellipsis*.

- (12) a. John might be proud of his father, and Bill might ~~be proud of his father~~, too.
 b. John might be proud of his father, and Bill might be ~~proud of his father~~, too.

In principle, the ellipsis site in predicate ellipsis can be either AP, which is the complement of Pred, or PredP, selected by v_b (Recall the structure of English copular constructions as illustrated in (2)). At this stage, it is not clear whether the ellipsis site is AP or PredP. Suppose first that the ellipsis site is AP. The licensor must be a functional head c-commanding the AP. The asymmetry between (12b) and (13) indicates that the licensor of the predicate ellipsis cannot be Pred, assuming that both the copular verb in (12b) and *seem* in (13) c-command PredP whose head takes the ellipsis site AP as a complement (see also Bowers 2001 and Basilico 2003).

- (13) *John might seem clever and Bill_i might seem, too.

If the licensor were Pred selecting the ellipsis site AP, then there should be no reason (12b) and (13) exhibit this asymmetry in predicate ellipsis. Thus, the licensor must be a functional head higher than PredP. The same is true if the ellipsis site in (12b) is PredP. Then, the licensor of predicate ellipsis must be a head c-commanding PredP.

The discussion above shows that, whether the ellipsis site in (12b) is PredP or AP, the licensor of predicate ellipsis must be a functional head c-commanding PredP. Then, we can conclude that the lowest possible licensor is the copular verb. (Recall the assumption that copular verb selects PredP.)

Bearing this in mind, consider the phasehood of v_b P. Deal (2009) argues that v P headed by the copular verb is a phase (see also Legate 2003 and Sauerland 2003). Then, v_b can have an EPP-feature (Chomsky 2000, 2001). Given this, it is predicted that a *wh*-element could be extracted out of the ellipsis site in predicate ellipsis, regardless of whether predicate ellipsis occurs in matrix clauses or embedded clauses. The reason is as follows: According to the proposal advanced in this paper, predicate ellipsis occurs when all the featural requirements of the ellipsis licensor are satisfied. Given that the lowest possible licensor of predicate ellipsis is the copular verb, predicate ellipsis occurs when the operations triggered by the copula verb are completed at the earliest. Then, due to an EPP-feature on the copular verb, a *wh*-element base-

generated inside AP can be located outside the ellipsis site when predicate ellipsis occurs, whether or not the copular verb undergoes head movement. This prediction is borne out, as illustrated in (14).⁴

- (14) a. I don't know what shouldn't Bill be proud of, but I have a good idea about what he should be.
 b. What shouldn't John be proud of, and what should he be?
 c. ?I don't know what John isn't proud of, but I have a good idea about what he is.
 d. What isn't John proud of, and what is he?

Now, let us move on to the next puzzle. As shown in (6), repeated here as in (15), regular VPE allows extraction regardless of whether ellipsis occurs in the matrix clause or the embedded clause. This contrasts with v_bP ellipsis.

- (15) a. Who will Bill kiss and who will John? (Messick and Thoms 2016)
 b. I don't know who John won't criticize, but I have a good idea about who he will.

Despite a large body of work on the syntactic and semantic nature of Voice, there is not yet full consensus on it. Nonetheless, in this paper, I assume that Voice is distinct from v (Legate 2014, among many others), that it bears a feature related to voice - [+Active] or [+Passive] (Merchant 2013), and that an Agent subject is introduced by Voice (Alexiadou et al. 2015).

Merchant (2013) argues that the ellipsis site of regular VPE is in fact vP immediately dominated by VoiceP, assuming the structure below T is VoiceP > vP > VP. Adopting this view, Aelbrecht (2010) suggests that an object *wh*-element can be located outside the ellipsis site, namely [Spec, VoiceP], at the point of vP ellipsis. This is because VoiceP, but not vP , is a phase head (Baltin 2012, Legate 2014, among many others), and thus, internal merge of the *wh*-element to [Spec, VoiceP] is possible. In this paper, I adopt Aelbrecht's analysis for regular VPE.

Given this, I suggest that the reason v_bP ellipsis and regular VPE exhibit the extraction contrast in embedded questions therefore arises as follows: In v_bP ellipsis, the ellipsis site is selected by T in which a modal, functioning as ellipsis licenser, is base-generated, and the object *wh*-element remains inside the ellipsis site when v_bP ellipsis occurs. This is because [Spec, TP] cannot be an appropriate landing site for the moving object *wh*-element. On the other hand, in regular VPE, whether the licenser is T or Voice, the object *wh*-element can be located in [Spec, VoiceP] at the point of ellipsis. (Recall that the ellipsis site in regular VPE is vP). Consequently, the *wh*-element can be pronounced outside the ellipsis site.

A question that arises at this point is why v_bP is not selected by Voice, but by T, while the ellipsis site in regular VPE, namely vP , is selected by Voice. I propose that the extended domain of verbs that make a semantic contribution has VoiceP. On the other hand, the copular verb *be* is semantically vacuous and it functions merely as a syntactic relator that links the subject and the predicate. To the best of my knowledge, there is no analysis suggesting that the copula is associated with Voice information represented with the [+Active]/[+Passive]-feature. Thus, it is

⁴ A question that arises here is why vP in the transitive verbal domain is not a phase, while v_bP in the copular verbal domain is. I assume here that the highest projection of the verbal domain is a phase, following Bošković (2014). The highest phrase in the verbal domain of a transitive verb is VoiceP, while the verbal domain of a copular verb is v_bP . Thus, the extraction asymmetry between the sentences in (4) and the sentence (5) lends further support to the contextual phasehood approach.

not implausible to assume that the verbal domain of the copula lacks VoiceP, and that this contrasts with the state of affairs for other verbs (at least open-class ones). The present analysis contrasts with analyses suggesting that extended domains of verbs that neither introduce an external argument nor occur with (overt) Voice morphology, such as unaccusative verbs and anticausative (or inchoative) verbs in English, lack VoiceP (Alexiadou and Anagnostopoulou 2004; Alexiadou et al. 2015). If the present proposal is on the right track, it is predicted that verbs such as unaccusative verbs, including the raising verb *seem* and anticausative verbs, should allow non-subject *wh*-phrase extraction out of the embedded VPE ellipsis site. On the other hand, if these verbs lacked a VoiceP layer entirely, it is expected that extraction would not be permitted. The reason is as follows: Suppose that the ellipsis site of VPE is ν P (Merchant 2013) and that the licensor T selects ν P. According to the proposal on the timing of ellipsis in (7), ν P is elided as soon as T satisfies its featural requirements (i.e., Agree in ϕ -features and the EPP). These features are satisfied as soon as T is introduced into the derivation. At the point of VPE, non-subject *wh*-phrases base-generated inside the ellipsis site have not yet moved to a position outside of it. This is because Spec,TP is not an appropriate intermediate landing site of non-subject *wh*-phrases that undergo \bar{A} -movement. The facts in (16) suggest that such extraction is in fact well-formed, suggesting, in turn, that even these raising/unaccusative verbs include the relevant intermediate landing site (VoiceP).

- (16) a. ?Although I wonder what John seems to like, I don't wonder what he doesn't ~~seem to~~ like.
 b. I don't know what John become, but I know what Mary did ~~become~~.
 c. I don't know at which station a train won't arrive, but I know at which station one will ~~arrive~~.

To summarize, ellipsis is an operation that occurs in overt syntax. In other derivational approaches to ellipsis, such as Aelbrecht (2010) and Baltin (2012), XP ellipsis occurs when the licensor of XP ellipsis is introduced into the derivation. However, in this paper, I have shown that there are some cases where ellipsis can be delayed, and I have argued that the point of ellipsis is crucially dependent on the point where all the featural requirements of the ellipsis licensor are satisfied.⁵

4 What Is Elided?

In the previous section, I have discussed when ellipsis occurs. In accounting for the extraction asymmetry between ν_b P ellipsis in main questions and ν_b P ellipsis in embedded questions, I

⁵ I have mentioned in fn. 2 that not all native speakers of Standard English judge that object *wh*-phrase extraction out of the ellipsis site in embedded ν_b P ellipsis is prohibited. Even though I have no definite answer to this variation, I can speculate the following possibility. According to Bobaljik (1995), an element which is moved to a higher position in narrow syntax can be pronounced in its base-position. One instance in Standard English is Quantifier Raising. Given this, suppose that a portion of native speakers of English have grammar where T-to-C movement in embedded questions occurs in the narrow syntax, but the displaced modal is pronounced in T, as though no T-to-C movement occurred in the narrow syntax. If this is true, then object *wh*-phrases can be located outside the ellipsis site even in embedded CPs at the point of ellipsis. This is because the embedded T in questions contains the [*u*C]-feature in the narrow syntax, similar to matrix T in questions.

proposed that any element that fails to be located outside the ellipsis site at the point of ellipsis is deprived of its PFM (phonological feature matrix).

I assume here that a lexical item contains a PFM and a FFM (formal feature matrix). Even though segmental content (i.e. phonological features) is not present in the lexical items in narrow syntax, every lexical item contains a PFM which is empty. When it is sent to PF after Spell out, the segmental content is placed into the PFM (See Halle and Marantz 1993). Additionally, the formal features of a lexical item are present in a lexical item when it enters the syntactic derivation from the lexicon, and the formal features are located inside a FFM. I will put the semantic features aside, which are unrelated to the present discussion.

Given this, I argue that ellipsis is a syntactic operation that only eliminates the PFMs of lexical items inside the ellipsis site. However, ellipsis does not get rid of their FFMs. Once PFMs of lexical items are eliminated, segmental content, which is responsible for sound of elements, cannot be inserted into those elements, and thus, they are not pronounced at PF. This proposal predicts that lexical items that have been deprived of their PFMs could be eligible goals/targets for formal operations that occur after deletion, since the lexical items still contain their FFMs. One important subcase of this prediction is that null operators located inside the ellipsis site at the point of ellipsis should be able to undergo movement after ellipsis, assuming that null operators contain the PFMs. This contrasts with Baltin's (2012) and Aelbrecht's (2010) derivational approaches to ellipsis suggesting that once XP ellipsis occurs, everything inside the ellipsis site becomes frozen for further formal operations. In what follows, I provide arguments supporting the present proposal.

4.1 Relative Clauses

In order to illuminate the structure of English (restrictive) relative clauses, several approaches have been proposed. One of them is the matching analysis, proposed by Lees (1960), Chomsky (1965), and Sauerland (1998). On this approach, relative clauses have both the overt external head and its corresponding overt internal head, which do not form a movement chain. The internal head is base-generated in its theta position inside the relative clause, and moves to the highest position of the relative clause. The internal head is phonologically deleted under identity with the external head NP. Hulsey and Sauerland (2006) argue that there are certain environments where the matching analysis is forced. One is the case where the relative CP has been extraposed, exemplified in (17).

(17) I bought the book last week that John read.

I assume here that relative C contains an uninterpretable feature [*uOp**] or [*uwh**], which contains an EPP property motivating movement of an operator, given that all movement is feature-driven (Chomsky 1995, van Urk and Richards 2015, among others). This indicates that the uninterpretable feature in relative C searches for an operator containing a matching interpretable feature (i.e. [*iOp*] or [*iwh*]). After establishing an Agree relation, relative C attracts the operator to its specifier position. Otherwise, the EPP requirement of the relative C would not be satisfied, and thus, the derivation would crash.

Given this, consider the following sentences containing a restrictive relative clause.

- (18) a. Tom will be fond of all the books next year which Mary will be fond of.
 b. Tom will be fond of all the books next year that Mary will be fond of.

In the sentences in (18), the relative CPs are extraposed. (18b) is perhaps slightly better than (18a). However, when v_bP is elided, there is a sharp contrast in the grammaticality, as shown in (19).

- (19) a. *Tom will be fond of all the books next year which Mary will ~~be fond of~~.
 b. ?Tom will be fond of all the book next year that Mary will ~~be fond of~~.

In both (19a) and (19b), v_bP ellipsis occurs just after T merges with the ellipsis site. This is because all the featural requirements in T – Agree in ϕ -features and the EPP – are satisfied before C enters the derivation, as I have suggested in the previous section. Then, since the operator and the internal head in (19a) and (19b) fail to escape from the ellipsis site at the point of ellipsis, they must be elided along with v_bP .

There are two questions that arise here. First, why do the two sentences in (19) exhibit a sharp contrast in grammaticality? Second, in order for (19b) to be grammatical, the uninterpretable feature on the relative C with the EPP property, namely the $[uOp^*]$, must be satisfied. Then, how can it be satisfied even though the null operator containing a matching interpretable feature (e.g. the $[iOp]$ -feature) is elided within the ellipsis site? These questions can be accounted for with the proposal advanced in this section: At the point of v_bP ellipsis, both the operator *which* and the internal head *book* fail to escape from the ellipsis site. When ellipsis occurs, the PFMs of the lexical items inside v_bP , including the operator *which* and the internal head *book*, are eliminated. However, in (19a), the operator *which* is pronounced outside the ellipsis site. Consequently, (19a) is ungrammatical, since the operator whose PFM has already been removed is pronounced outside the ellipsis site.

On the other hand, in (19b), the relative operator is null, and *that* is a complementizer. When v_bP ellipsis occurs, the PFMs of the null operator and the internal head *book* are removed. Nonetheless, the constituent consisting of the null operator and the internal head, which are deprived of their PFMs, are eligible for further formal operations. Subsequently, the null operator and the internal head, which now lack the PFMs, can enter into an Agree relation with relative C containing the $[uOp^*]$ -feature, and undergo movement to Spec,CP of the relative clause. As a result, the EPP requirement on C is satisfied.

4.2 Comparative Deletion

English comparative deletion is exemplified in (20).

- (20) John picked up more apples than Mary ate.

Kennedy (2002) proposes that English comparative deletion is formed as illustrated in (21).

- (21) English Comparative Formation
 Move the compared constituent to the specifier of the complement of *than*.

Bearing this in mind, consider comparative deletion combined with v_bP ellipsis, as illustrated in (22).

(22) John will be fond of more friends than Mary will ~~be fond of~~.

In this sentence, the compared constituent moving within the *than*-CP fails to escape from the ellipsis site at the point of ellipsis. The grammaticality of (22) indicates that the elided element can be an eligible target/goal for the further formal operation occurring in narrow syntax. That is, the uninterpretable feature on C Agrees with its matching feature of the compared constituent, and its EPP requirement is satisfied by movement of the compared constituent to Spec,CP of the *than*-CP. This is possible because the FFM of the compared constituent is preserved, even though its PFM is eliminated as a result of v_bP ellipsis, and thus, it is visible for the operations after ellipsis.

4.3 Topicalization

According to Chomsky (1977) and Lasnik and Stowell (1991), a topicalized element is base-generated in the clause-initial position and binds a null operator that has moved from its base position. I assume that the null operator creating a movement chain moves to Spec,CP, and that the topicalized element is base-generated adjoined to CP. This is in line with the analysis of Hanging Topic Left Dislocation (HTLD) (cf. Grohmann 2000).

Given this, let us consider the following sentences.

- (23) a. I think John won't be fond of this book, but [that book]₁, I think he will ~~be fond of~~ e_1 .
 b. People said that Bill mightn't be proud of Jane's success, but [Mary's success]₂, people said he might ~~be proud of~~ e_2 .

In the base-generation approach, each topicalized element in (23) is base-generated in the sentence-initial position of the second conjunct, and its coindexed null operator has to move from the empty category position to the matrix clause. If we assume that null operator movement in this case is also feature-driven, the grammaticality of the sentences in (23) indicates that the null operator which fails to be located outside the ellipsis site at the point of ellipsis can participate in further formal operations.

5 *Wh*-movement After Deletion?

I have argued that elements that have been deprived of their PFMs are eligible for further formal operations. Due to this, they can be appropriate targets/goals for Agree and movement. Bearing this in mind, consider (24).

- (24) *I don't know what John shouldn't be proud of, but I have a good idea about John should ~~$[_{v_bP}$ what₁ be $[_{PredP}$ proud of t_1]]~~.

Without further modifications, the present proposal predicts that the sentence in (24) would be grammatical. The reason is as follows: the *wh*-element in the second conjunct fails to exit the ellipsis site by the time v_bP ellipsis occurs, and thus, the PFM of *what* is removed inside v_bP . However, the *wh*-element can take part in further formal operations. Subsequently, the [*uwh**]-feature with an EPP property on the embedded C can Agree with the [*iwh*]-feature of the *wh*-element, and the *wh*-element can move to Spec,CP – even though it is not pronounced. However, the sentence is ungrammatical. Thus, this example seems to be a problem for the present approach. In this section, I propose a prosodic condition that can rule the sentence (24) out, by adopting and modifying Richards' (2016) Contiguity.

Richards (2016) suggests that syntax can make reference to some types of phonological information. As a result, syntax generates a prosodic representation as the derivation proceeds, alongside the syntactic representation. Based on this, Richards proposes that *wh*-questions universally obey the following prosodic condition, called Contiguity, in narrow syntax.

(25) Contiguity

Given a *wh*-phrase α and a complementizer C where α takes scope, α and C must be dominated by a single ϕ , within which α is *Contiguity-prominent*.

(26) Contiguity prominent

α is Contiguity-prominent within ϕ if α is adjacent to a prosodically active edge of ϕ .

In this analysis, even though complementizers are phonologically null, they are relevant to the construction of prosodic structure. In my terms, every complementizer contains a PFM in narrow syntax, regardless of whether phonological features (i.e. segmental content) are inserted into the PFM or not at PF, and that there are two types of complementizers – complementizers whose PFMs are filled with segmental material at PF, and complementizers whose PFMs remain empty at PF. The former are pronounced at PF, while the latter are not. Whether or not the PFM of a complementizer lacks segmental content is not relevant until it is sent to PF after Spell-out.

Adopting this, I propose that lexical items (including null operators and null complementizers) can participate in prosodic structuring as long as they contain PFMs. That is, whether lexical items can take part in prosodic structuring in narrow syntax is not determined by the presence/absence of the segmental content inside their PFMs at PF, but by the presence/absence of the PFM itself. This is the reason a phonologically null complementizer can be present in prosodic trees. There are therefore two cases where lexical items can be unpronounced: one is the case where the lexical items do not contain the PFMs as a result of ellipsis, while the other is the case where the lexical items contain the empty PFMs at PF.

Now, let us return to the question of why (24) is ungrammatical. To explain this, I propose to slightly modify Richards' prosodic requirement (25), as illustrated in (27).

(27) Contiguity (modified version)⁶

Every pair $\langle C, wh\text{-phrase} \rangle$ that stand in an Agree relation must be associated with PFMs $\langle \text{PFM}[C], \text{PFM}[wh\text{-phrase}] \rangle$, such that there is at least one ϕ that contains both of these PFMs, and within which $\text{PFM}[wh\text{-phrase}]$ is Contiguity-prominent.

⁶ I am indebted to Omer Preminger for his refining this constraint.

The reason for the modification is as follows: The original prosodic requirement in (25) cannot explain the ungrammaticality of (24). This is because when the *wh*-phrase is not present in a ϕ containing the complementizer, the prosodic requirement in (24) is vacuously satisfied. This is similar to the argument used in Chomsky (1981) to derive the fact that PRO is ungoverned. Chomsky argues that PRO can satisfy both Condition A and Condition B, when it does not have a governing category. In order for an item not to have a governing category, it has to be ungoverned. Lasnik and Uriagereka (1988) present the following analogue: There are two ways to comply with a law that handguns must be registered. The first is to have guns and register them. The other is to have no guns, which is the option that is of interest here.

I suggest here that the prosodic requirement in (27) is calculated at each interrogative CP level, and that a derivation that does not obey the prosody requirement is ill-formed. Additionally, I assume throughout that elements that are deprived of their PFMs as a result of ellipsis become invisible as far as prosodic structure is concerned, and cannot participate in phonological phrasing in the narrow syntax. In (24), prior to overt movement of the *wh*-element, its PFM has already been removed. Since the *wh*-phrase is invisible in prosodic phrasing, there cannot be a ϕ containing both the PFM of a *wh*-phrase and the PFM of a complementizer in the prosodic tree. Thus, this derivation fails to meet the prosodic requirement in (27).

A question that arises at this point is why the following sentence is grammatical, even though the PFM of the *wh*-phrase is removed, similar to the *wh*-phrase in (24).

(28) I know who Mary will be fond of, but John doesn't.

I suggest that the reason (28) is well-formed is that the prosodic requirement in (27) has already been satisfied inside the embedded clause before ellipsis, assuming that the prosody requirement is calculated at each interrogative CP level. In the present derivational approach to ellipsis, matrix VPE in (28) occurs after the interrogative CP is completed. In the embedded clause (i.e. before matrix VPE occurs), the *wh*-phrase moves to embedded Spec,CP, and the prosodic condition in (27) is satisfied at the embedded CP level.

To summarize, as long as an element contains its PFM in narrow syntax, whether the phonological content is inserted into the PFM or not at PF, the element is visible to the prosodic structure being assembled in narrow syntax. However, once the PFMs of lexical items are removed, they are no longer visible to prosodic principles. In (24), the *wh*-phrase that is deprived of its PFM is not an eligible object for the prosodic requirement calculation, and thus, the sentence (24) violates the prosody requirement in (27). Consequently, the ungrammaticality of (24) does not undermine the proposal advanced in this section that elements that lack PFMs can be eligible for formal operations that occur after ellipsis.

6 Conclusion

In this paper, I proposed that XP ellipsis occurs as soon as all the featural requirements of the licensor of XP ellipsis are satisfied. This can explain why embedded v_bP ellipsis does not allow object *wh*-phrase extraction, while matrix v_bP ellipsis does. To account for the asymmetry between embedded v_bP ellipsis and embedded regular VPE in extractability of object *wh*-phrase, I suggested that the verbal domain of copula, which is semantically vacuous, does not contain Voice, while the extended domains of verbs that make a semantic contribution contains a VoiceP

layer. I also argued that what is elided as a result of ellipsis is PFMs of lexical items inside the ellipsis site. On the other hand, ellipsis preserves their FFMs. Due to this, elements whose PFMs have already been eliminated can participate in further formal operations triggered by formal features. In order to rule out overgeneration caused by this proposal, I proposed a prosodic constraint *wh*-questions must obey, adopting and modifying Richards' (2016) Contiguity.

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