

Ellipsis: its way from syntax to morphology

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Abstract: This chapter focuses on the mechanics of ellipsis at the syntax –morphology interface. It is shown that two of the adduced arguments against syntactic identity, namely, the distribution of traces within E-sites and certain types of inflectional mismatches, are illusory once phrasal ellipsis is explicitly defined as an operation of narrow syntax. On this theory, ellipsis bleeds vocabulary insertion at PF by deleting the variable that triggers late insertion of phonological material at PF. Phrasal copies and E-sites are both subject to ellipsis in this sense. The particular way in which these two silent objects interact explains why phrasal traces are irrelevant when it comes to calculating identity within a given E-site. This analysis not only answers well-known objections against syntactic identity but is also superior to competing semantic analyses in nontrivial ways. As for heads, it is proposed that they are subject to ellipsis at PF under identity and morphological locality. This derives the lexical identity requirement in certain V-stranding VP-ellipsis languages (Goldberg 2005), even assuming syntactic head movement through adjunction. Finally, certain inflectional mismatches are derived by the syntactic nature of phrasal ellipsis and the timing of morphological operations. The broad picture is a model for the timing of ellipsis that generalizes beyond traditional surface anaphora accounting also for the distribution of null arguments in radical and consistent null subject languages, among other phenomena that are at the heart of the theory of grammatical deletion.

Key words: ellipsis, identity, vocabulary insertion, copy theory of movement, argument ellipsis, *pro*-drop

1. Introduction: timing and identity

Current research in the theory of ellipsis confirms earlier hypotheses in the transformational tradition that certain types of silent anaphoric phrases contain abstract syntactic structure, which in the ideal case essentially corresponds to the same abstract structure as their non-elliptical counterparts (see Merchant 2019 for a lucid overview). These empty anaphors are called *surface anaphora* in Hankamer & Sag's (1976) terminology (or just *ellipsis* in Hankamer & Sag's 1984 terminology). The sentences in (1) are examples of surface anaphora in English:

- | | | |
|-----|---|---------------|
| (1) | a. Bill likes movies and Peter does too. | (VP-ellipsis) |
| | b. Bill bought a magazine and Peter a book. | (Gapping) |
| | c. Bill kissed someone. Guess who. | (Sluicing) |
| | d. Carthage's destruction and Rome's | (NP-ellipsis) |
| | e. Bill read <i>Syntactic Structures</i> but not Peter. | (Stripping) |

Some terminological remarks from the beginning will be useful for subsequent discussion. Following current standard conventions, I call the missing material *E-site* (E for ellipsis), which will appear between angle brackets (E-site: <...>). The antecedent will be abbreviated as A. For a sluicing example like (1a), a rough analysis would be then as follows:

- (2) [A Bill kissed someone]. Guess who <Bill kissed *t*>.

When relevant, I call the underlined constituents in the antecedent and the elliptical sentence, *correlate* and *remnant*, respectively.

A trait of surface anaphora is that they need for a linguistic antecedent, on the basis of which the meaning of E-sites is (partially) recovered. Of course, this requires a good theory of antecedence relations in grammar and discourse that provides us with the correct method to determine what can count and what cannot count as a linguistic antecedent for a given E-site. To the best of my knowledge, there is no such a theory. In principle, an antecedent is recognized by speakers' intuitions regarding the meaning of the E-site. With reference to the example in (2), the meaning of the E-site is resolved on the basis of the meaning of A. Being a question, the elliptical sentence denotes a set of propositions, that is, $\lambda p. \exists x[Human(x) \ \& \ p=\lambda w[Bill \ kissed \ x \ in \ w]]$, which expresses the set of alternative answers to the question at hand (assuming, of course, a Hambling/Karttunen approach to the semantics of questions). Crucially, p is in an identity relation with the proposition expressed by A (i.e., $\lambda w. \exists x[Human(x) \ \& \ Bill \ kissed \ x \ in \ w]$). Thus, the theory of surface anaphora must provide an explicit account of how the meaning of E-sites is recovered on the basis of the information made available by a salient linguistic antecedent.

Broadly speaking, there are two lines of research. For some, the relevant information is syntactic in nature. A strong claim is that ellipsis requires identity of syntactic structures. A prominent account along these lines is Fiengo & May (1994), according to which E-sites are conceived of as covert reconstructions; i.e., “set of token structures under a syntactic identity condition” (Fiengo & May 1994: 191). For a case of VP-ellipsis like (1a), we say that there are two members of the reconstruction of the VP *likes movies*, one of which is covert or elided. Fiengo & May uses his reconstruction theory mainly for VP-ellipsis in English, a type of ellipsis that seems to behave according to the expectations of reconstruction theory. Chung *et al* (1995) soon recognized that the theory doesn't generalize straightforwardly to sluicing (Ross 1969). In order to conciliate sluicing with some variants of the theory of reconstruction (i.e., LF copy), one needs to manipulate syntactic material at LF. One type of manipulation is called *IP-recycling*; basically, LF-copy. Another crucial LF operation is what they called *sprouting*, i.e., an operation that adds variables within sluice sentences whose remnant doesn't have an overt correlate:

- (3) a. She's reading. I can't imagine what.
 b. He shouted again, but I don't know to whom/who to.
 c. They're going to serve the guests, but it's unclear what. [Chung *et al* 1995: 242]
 d. Joan ate dinner but I don't know with whom. [Chung *et al* 1995: 246]

Simply recycling the antecedent IP in the E-site will not end up in a licit LF. Consider the antecedent IP in (3d). Once recycled into the E-site, we obtain the rough LF in (4):

- (4) *IP-recycling*: Joan ate dinner but I don't know [_{CP} with whom [_{IP} **Joan ate dinner**]]

This is an illicit LF, in which the *wh*-constituent doesn't bind any variable. LF, then, performs the appropriate manipulation, sprouting the required PP variable:

- (5) *Sprouting*: Joan ate dinner but I don't know [_{CP} [with whom]_i [_{IP} Joan ate dinner **PP**_i]]

These brief remarks show why reconstruction in Fiengo & May's sense cannot give us the right necessary condition for creating licit E-sites. Merchant (2001) has shown that, even if one was willing to accept the type of LF manipulations that Chung *et al* propose, there are still some set of facts that makes their theory untenable. One that is particularly irreconcilable with the theory of reconstruction (or relatives) is contrast sluicing of the type I illustrate in (6), from Merchant (2001):

- (6) John has five cats but I don't know how many dogs.

Here, the E-site is not a reconstruction in Fiengo & May's sense, since the antecedent IP and the elided IP are not occurrences of the same phrase marker over a given terminal vocabulary. IP-recycling would not produce any licit LF, either; copying [_{IP} John has five cats] in the E-site would produce both a syntactic and a semantic crash.

But there is more. According to Merchant, reconstruction theories must also offer a reasonable account of the many *feature mismatches* attested between As and E-sites:¹

- (7) Decorating for the holidays is easy if you know how!
 a. ≠* ... how [decorating for the holidays]
 b. = ... how [to decorate for the holidays]
- (8) a. I'll fix the car if you tell me how.
 b. ≠* ... how [I'll fix the car]
 c. = ... how [to fix the car]
- (9) a. "I can't play quarterback: I don't even know how."
 [Bart, *The Simpsons*, 'Homer coaches football' episode]
 b. Close the window! Do I have to tell you how?
 c. Eat (something), if you can figure out what!
- (10) I remember meeting him, but I don't remember when. [=I met him]

Merchant's reasoning goes as follows. Taken together, the sprouting cases and the feature mismatches cases indicate that reconstruction theories are misleading. Identity in ellipsis doesn't make any reference either to token structures or to the terminal nodes over which these token structures are built. Identity in ellipsis, instead, makes reference to semantic objects. Concretely, sluicing requires identity in the propositional content of the antecedent and the E-site. In a nutshell, ellipsis is licit if the E-site and the antecedent entails each other under the operation of Focus-Closure. The theory dispenses then with any reference to both syntactic isomorphism and the formal content of terminal nodes. Such an approach ensures licit ellipses at least for some cases of feature mismatches and for sprouting sluices. Consider briefly (10), an adjunct sprouting example containing a feature mismatch in finiteness. Existential closure of the *wh*-variable in the E-site and of an implicit tense variable in the antecedent ensures mutual entailment between the expressions under relation. So, with reference to an evaluation time and an assignment function

¹ A third argument involves Vehicle Change phenomena (Fiengo & May 1994). Space reasons prevent detailed discussion of this argument, but see Saab (2008).

g, we obtain the denotations in (11), after some simplifications and assuming $g(2) = \text{Jason}$ and $g(3) = \text{John}$:

- (11) $[[_{\text{E-site}} I_2 \text{ met him}_3 t]]^{t,g} = \exists t': t' < t \ \& \ \text{Jason meet John in } t'$
 $[[_{\text{antecedent}} \text{PRO}_2 \text{ meeting him}_3 t]]^{t,g} = \exists t': t' < t \ \& \ \text{Jason meet John in } t'$

It is easy to see now that A entails the E-site and the E-site entails A. Ellipsis is thus ensured with no reference to the syntactic properties of A and the E-site. Beyond its initial success, it was soon noticed that the mutual entailment approach is too weak. For instance, Chung (2006) showed that the absence of some particular instances of sluicing in preposition stranding environments cannot be accounted for under mutual entailment. Here is Chung's paradigm:

- (12) a. They're jealous, but it's unclear of who.
b. Joe was murdered, but we don't know by who.
c. Last night he was very afraid, but he couldn't tell us of what.
d. Mary was flirting, but they wouldn't say with who.
e. We're donating our car, but it's unclear to which organization.
f. U.N. is transforming itself, but into what is unclear. (*New York Times* 2/28/04)
g. She phoned home, but they weren't sure from which city.
- (13) a. *They're jealous, but it's unclear who(m).
b. *Joe was murdered, but we don't know who(m).
c. *Last night he was very afraid, but he couldn't tell us what.
d. *Mary was flirting, but they wouldn't say who(m).
e. *We're donating our car, but it's unclear which organization.
f. *U.N. is transforming itself, but what is unclear.
g. *She phoned home, but they weren't sure which city.

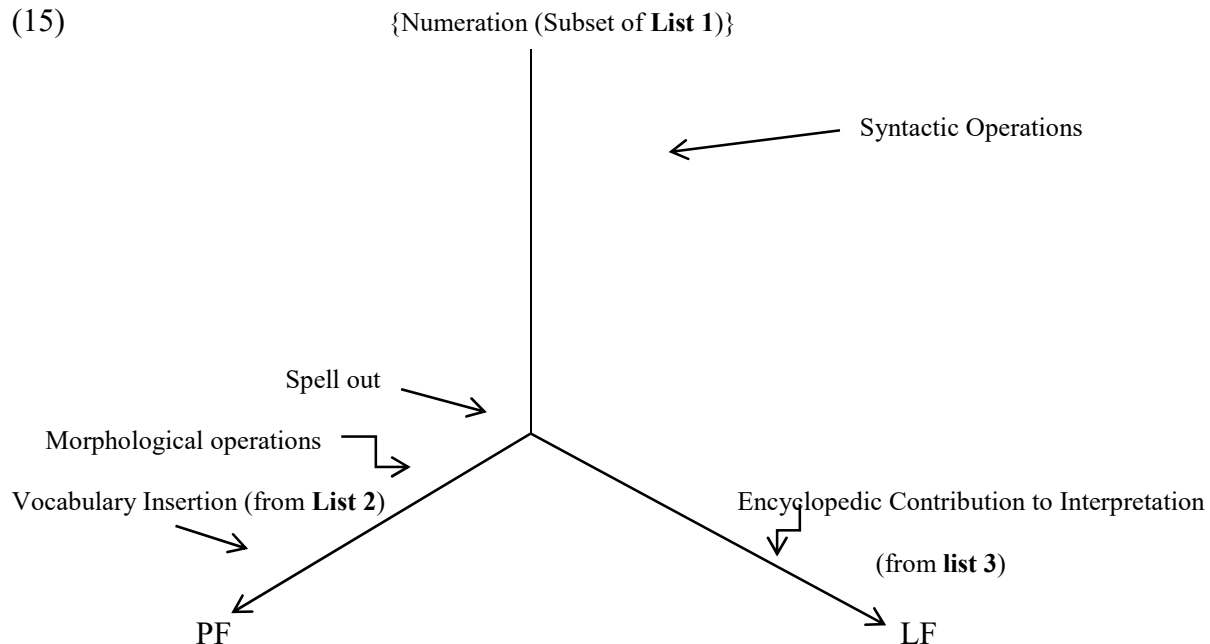
As should be clear, mutual entailment would not make the difference between (12) and (13), given that such a condition is satisfied in both cases. However, only the examples in (12) are licit ellipses.

Merchant himself pointed out another crucial problem for mutual entailment, namely absence of voice mismatches in high ellipses:²

² Intolerable voice mismatches of this type were first noticed by Merchant (2001), but there Merchant suggested a possible semantic difference triggered by the passive/active alternation. However, low ellipses, like English VP-ellipsis, do tolerate voice mismatches in both directions (active antecedent/passive E-site or vice versa). Here are two of the many examples discussed by Merchant (see Merchant 2013a: 78-79)

- (i) a. The janitor must remove the trash whenever it is apparent that it should be <removed>.
b. The system can be used by anyone who wants to <use it>.

This asymmetry between high and low ellipses regarding voice alternations cannot be easily accounted for in purely semantic terms. For this reason, Merchant proposes a syntactic identity condition that makes reference to the formal content of terminal nodes. The reason why voice mismatches are impossible in high ellipses is that Voice features are inside the E-site and must match the same features in A. E-sites in English VP-ellipsis, instead, exclude Voice heads from its domain; i.e., they higher domain of a VP ellipsis site is the lower VP, assuming a split VP domain, with Voice dominating V.



A crucial property of this conception of grammar is separationism, i.e., the fact that meaning-form connections are determined by the syntax in an all-the-way-fashion (Halle & Marantz 1994). Syntax manipulates abstract objects (from List 1) that are supplied with a given phonological exponent after syntax and through a set of lexical insertion rules (List 2). The primitives that syntax manipulates are Roots and abstract morphemes. Abstract morphemes are features drawn from a Universal Inventory and encode things like [past], [plural] and so on. Roots are represented by an index that is replaced at PF by a phonetic matrix (cf. Chomsky 1995, Embick 2000, Saab 2008, Acquaviva 2008, and Harley 2014, among others).

The post-syntactic component is not defined only by lexical insertion rules; otherwise, we would expect a perfect meaning-form connection. As is well-known, the connection is far from perfect; the objects built in the narrow syntax can be altered by a set of post-syntactic operations that move morphemes, delete features, add features and so on. Importantly, features that are purely morphological are not present in the syntax and syntactico-semantic features cannot be inserted after syntax. This working hypothesis is called Feature Disjointness:

Feature Disjointness:

- (16) Features that are phonological, or purely morphological, or arbitrary properties of vocabulary items, are not present in the syntax; syntacticosemantic features are not inserted in morphology. (Embick 2000: 188)

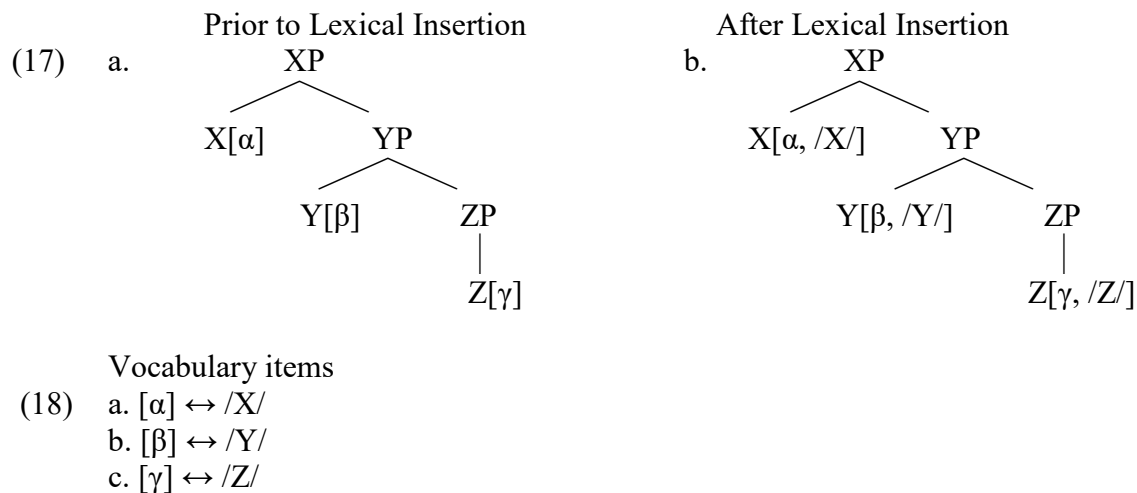
Finally, as for the LF side, the syntax provides an abstract object built out from Roots and abstract morphemes which is interpreted on the basis of the information available in List 3. Let me summarize the information contained in each of the lists in (15):

List 1: *Feature bundles:* Syntactic primitives, both interpretable and uninterpretable, functional and contentful.

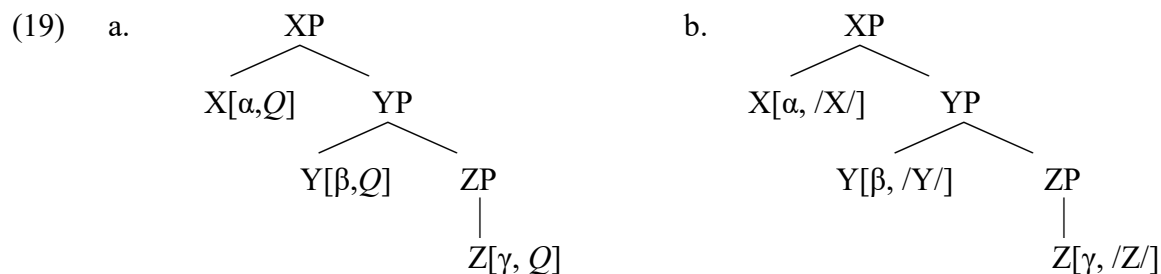
List 2: *Vocabulary Items:* Instructions for pronouncing terminal nodes in context.

List 3: *Encyclopedia*: Instructions for interpreting terminal nodes in context.

Here, I focus only on the interaction between List 1 and List 2, which is at the core of theory of ellipsis I defend. The basic question is how abstract morphemes are enriched with phonological information. The relevant procedure must be able to associate a given abstract morpheme taken from List 1 to a Vocabulary Item taken from List 2. On a standard account, lexical insertion (LI) adds phonological exponents in a tree like (17a) by consulting the vocabulary items in (18). Whenever the syntactic-semantic features present in a given terminal node match those present to the left of a given VI, the phonological exponent to the right of the VI is added to the abstract morpheme. The final result is illustrated in (17b):



Following Embick (2015), I call this view on LI *additive*, stressing the idea that terminal nodes are enriched with phonological information *via* LI. A less standard alternative is to assume that LI is *replacive*. On this approach, abstract morphemes, in addition to the syntactic-semantic bundles they possess, are also specified with a variable, Q , which is replaced for a phonological exponent through LI. LI thus amounts to *substitution of a free variable* (Embick 2015: 90). We can illustrate the replacive view as in (19):



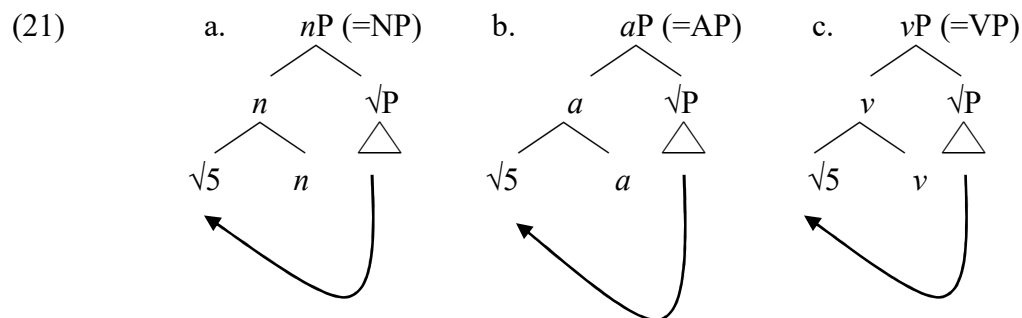
An important question is what type of objects are X, Y and Z both under the additive or the replacive views. Halle (1990), who adopts a replacive approach, assumes that only certain abstract morphemes possess Q , namely, those which empirically call for a late insertion solution. Embick, who also favors the replacive procedure, generalizes late insertion to all abstract morphemes but not to Roots, which are conceived of as phonetic matrixes. Here, as mentioned

above, I assume that, regardless of the view of LI one favors, late insertion applies for all abstract morphemes and Roots (Embick & Noyer 2001, among many others).

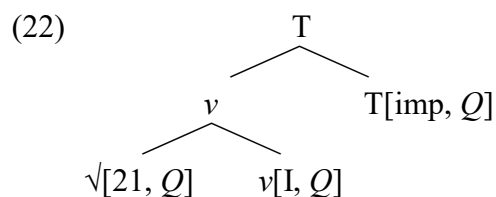
Before entering into the details of the theory of ellipsis I defend, let me provide a simplified derivation for the verbal form that occurs in the following sentence:

- (20) *pro* amábamos.
 lov.TH[I].IMP.1PL
 ‘We used to love.’

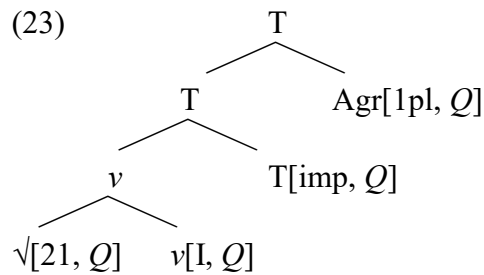
There are at least four morphological pieces in this complex verbal form, which correspond to the bare Root *am-*, the thematic vowel of the first conjugation *-a-*, the imperfect past *-ba*, and the agreement morpheme for the plural first person *-mos*. I assume that Roots have non-inherent category features; categorization of Roots occurs in the syntax via the combination with functional heads: the little *xs* (Embick & Marantz 2008):



An additional assumption is that theme vowels are realized on the category-defining head *v*. Finally, following Chomsky (2000, 2001), I adopt the hypothesis that there are no functional projections for agreement. Under this assumption, and regardless one’s commitments with the existence of an abstract *Agree* operation, agreement morphemes are not given by syntactic means alone. Put differently, the morphological piece of agreement present in (20) is not provided by any designated functional head in the syntax (i.e., there is no abstract morpheme of agreement taken from List 1) and, consequently, must be added by some other mechanism. Embick & Noyer (2001) propose that such an additional mechanism is post-syntactic. In other words, agreement information is realized on nodes that are added post-syntactically. These nodes are called *dissociated morphemes*. Thus, after syntactic head movement (more on this below), PF receives the complex head in (22). For the sake of illustration, I assume the replacive view of LI:



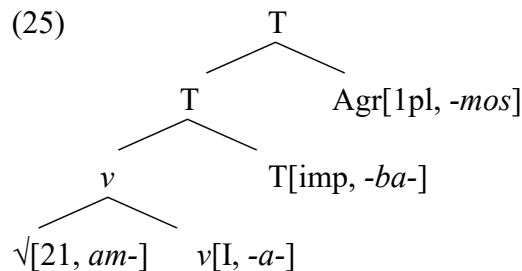
At PF, a dissociated agreement morpheme is added to the complex head in (22) on the basis of the person and number information of the subject or, depending on assumptions about *Agree*, on the basis of information present on T itself:



The process of LI then proceeds to add phonological information to the terminal nodes in (23). This requires consulting List 2. Here is an oversimplified set of VIs for the relevant nodes:

- Partial set of Vocabulary Items:
- (24)
- a. T[imp] ↔ -ba-
 - b. Agr[+1, +pl] ↔ -mos
 - c. v[I] ↔ -a-
 - d. √21 ↔ am-

Recall that the replacive view implies substitution of the free variable Q with a phonological exponent, whenever the syntactic-semantic content in the VI matches the syntactic-semantic content of the terminal node. Given (23) and (24) the matching is fully transparent; i.e., the syntactic-semantic information in the VI $T[imp] \leftrightarrow -ba-$ matches the information in the abstract node $T[imp]$, and so on. So, after the LI process is completed, we obtain the representation in (25):



As I already noticed, there are several simplifications in this toy derivation. Some of them are worth-mentioning for subsequent discussion. First, it is crucial to make explicit the identity relation that is at play between syntactic terminals and VIs. There is a broad consensus regarding the hypothesis that such an identity relation is inclusion; concretely, the syntactic-semantic information encoded on a given VI must be a subset of the syntactic-semantic information encoded on terminal nodes. Patterns of systematic syncretism across languages justify this claim. Second, it is often the case that more than one VI can apply to a given terminal node. In such cases, the most specified VI wins the competition. Both the subset relation and the competition problem are contemplated in the *Subset Principle* (Halle 1997: 128):

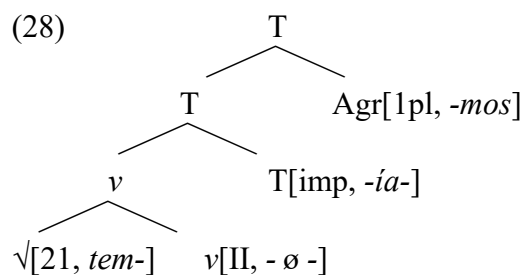
- Subset Principle:
- (26) The phonological exponent of a Vocabulary Item is inserted into a morpheme of the terminal string if the item matches all or only a subset of the grammatical features

specified in the terminal morpheme. Insertion does not take place if the Vocabulary Item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features in the terminal morpheme must apply.

A clear case of competition connected to our previous example comes from allomorphy at the tense node. In our example, the imperfect node is realized with the theme vowel *-a*, which is the default exponent. Yet, second and third conjugations trigger a different realization for the same node, namely *-ía*. A more complete representation of the imperfect must cover this property. Ordering the VIs in competition from the most specified VI to the default one is the standard way of proceeding:

- (27) T[imp] \leftrightarrow -ía- / {*v*_[II], *v*_[III]} ____
T[imp] \leftrightarrow -ba-

Consider a second conjugation verb like *temer* ‘to be afraid’. Insertion of the exponent *-a* is blocked here by the presence of a more specified VI *-ía*, which contains contextual information which is absent in the default VI. Therefore, the most specified second conjugation item wins the competition and the phonological exponent *-ía* is inserted into the relevant abstract morpheme:



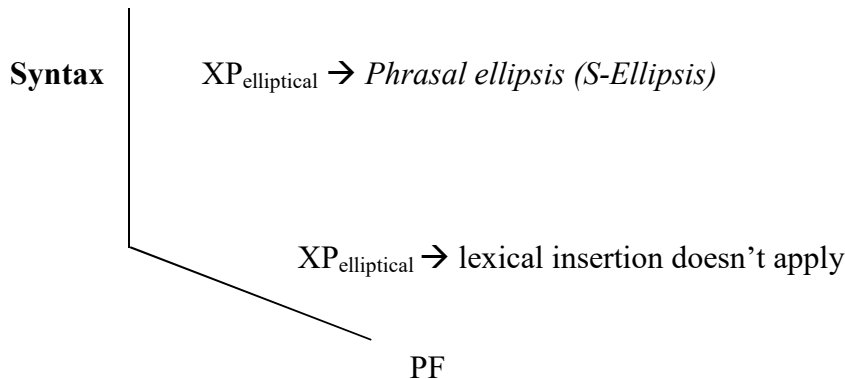
Both contextual allomorphy and syncretism will be relevant when deciding between alternative approaches to the nature of ellipsis. Let's now introduce the basics of the theory of ellipsis I propose.

2.2. On lexical insertion blocking: I-Assignment vs Q-deletion

I propose that ellipsis is a grammatical operation that instructs PF for LI blocking. In principle, any object built up in the syntax can be subject to ellipsis in this sense. As we will see, many of such syntactic objects meet the conditions for ellipsis at different stages of a given derivation. A particular division I propose is that phrases and heads can be elided but under different locality conditions. In addition, whereas phrases are elided in the syntax, heads are elided at PF. I will justify this division later. For the time being, I focus only on phrasal ellipsis and show how the theory accounts for the puzzles introduced in the introduction.

Here is a first approximation. Phrasal ellipsis applies entirely in the syntax. Any syntactic object that is syntactically marked as elliptical in the syntax is excluded of the LI procedure.

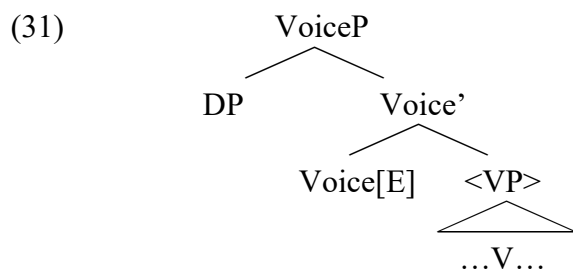
(29) Numeration



The theory of ellipsis must make explicit how LI blocking is defined. A proper definition of ellipsis, then, depends on the theory of LI one favors. Recall that there are at least two views on LI. On the additive approach, phonological information is added to abstract morphemes following the principles that govern LI (the Subset Principle, for example). On the additive view, such principles remain the same but LI consists of substitution of the free variable Q . In Saab (2008), I adopted the additive view and argued that LI blocking is implemented by marking labels within a E-site with an identity feature. Thus, in a labeled structure like (30), the label X receives an $[I]$ -feature if there is a syntactic antecedent formally identical (or non-distinct) to XP in the syntax. This operation is called $[I]$ -Assignment:

(30) $[I]$ -Assignment:
 $\{X^{[I]} \{X, Y\}\} \quad (= [_{XP^{[I]}} X YP])$

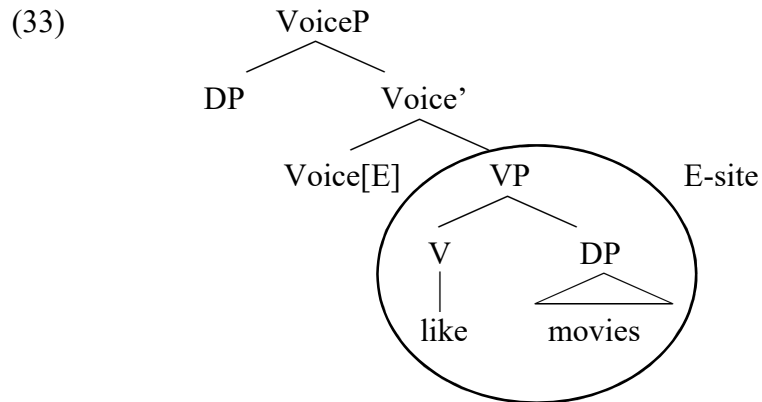
Let's assume that E-sites are licensed by the presence of an E-feature in the licenser of ellipsis. Following Merchant (2008b, 2013a), I adopt the hypothesis that English verbal ellipsis is deletion of the VP layer whenever this VP is selected by a Voice head that is specified with an E-feature:



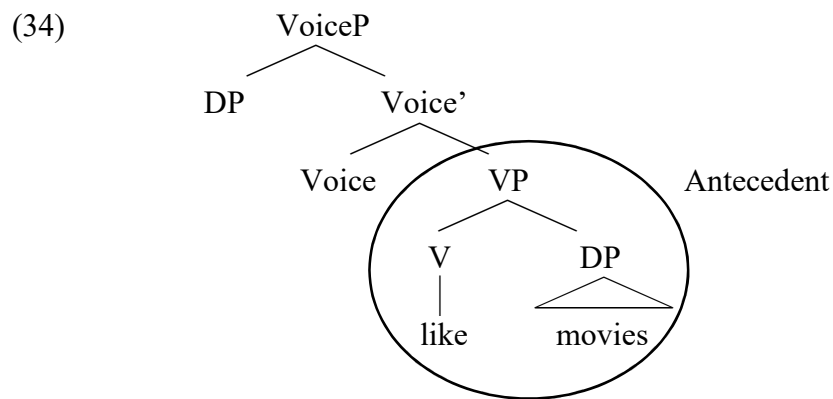
Under the I -Assignment view, each phrasal label must be marked with an I -feature when selected by a head encoding the E-feature. The process of I -Assignment requires finding an antecedent in the surrounding linguistic context. Once such an antecedent is found every head in the E-site must have an identical head in the antecedent. No particular isomorphism condition needs to be imposed if identity is consulted in a bottom-up fashion starting from the most embedded phrase in the E-site. Consider a simple example of VP-ellipsis in English:

(32) John likes movies and Peter does <like movies>too.

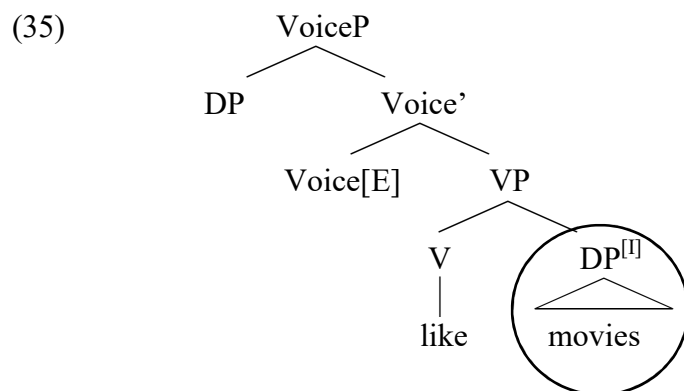
The E-site in the second conjunct has the following underlying structure:



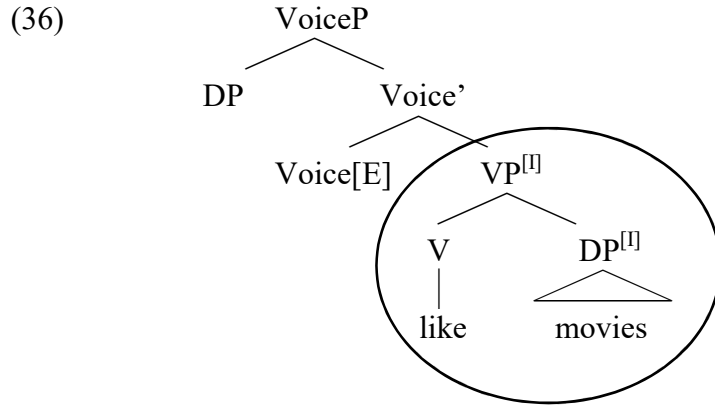
The antecedent of this E-site is the VP in the first conjunct:



Identity checking starts from the most embedded phrase, namely the object DP. Since in this case the head of this DP has an identical DP within the antecedent VP, *I*-Assignment marks its label adding an [I] feature on it. Importantly, the process is canceled if identity is not met, which is not the case here:



The next phrase that needs to be *I*-assigned is the VP. Again, identity between the head of this VP and the corresponding head in A is satisfied and, consequently, an [I] feature is added to the relevant label in the E-site.



At PF, VI is blocked for every terminal node projecting an *I*-assigned label. The relevant definitions are as follows (adapted from Saab 2008):

VI-Blocking (VIB):

- (37) Vocabulary Insertion does not apply in the domain of X^0 , X^0 a MW, if X^0 , or some projection of X^0 , is specified with a [*I*]-feature.

Associated definitions:

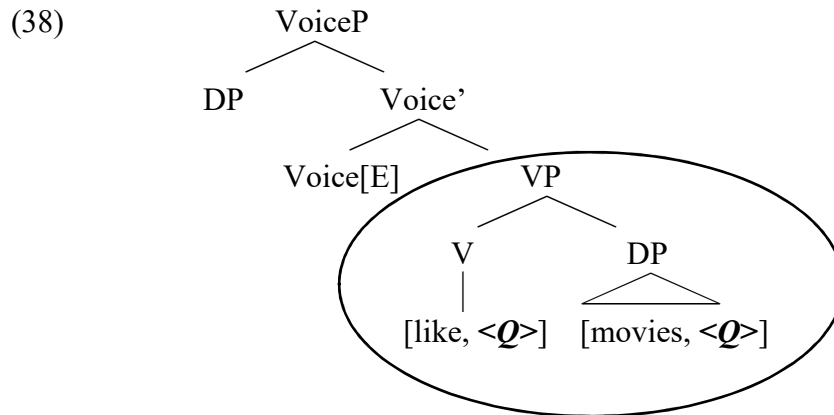
- (i) The domain of X^0 , X^0 a MWd, is the set of terminal nodes reflexively contained in X^0 .
Morphosyntactic word
- (ii) At the input to Morphology, a node X^0 is (by definition) a *morphosyntactic word* (MWd) iff X^0 is the highest segment of an X^0 not contained in another X^0 .
Subword
- (iii) A node X^0 is a *subword* (SWd) if X^0 is a terminal node and not an MWd.

[(ii) and (iii) from Embick & Noyer 2001: 574]

Thus, the PF effect of syntactic ellipsis is blocking vocabulary insertion for each terminal node in the relevant domains. The definition in (37) has some important formal implications that I will discuss latter. A proper definition of *identity* also deserves careful examination. For the time being, I keep the theory at this level of convenient simplicity and introduce refinements when necessary. What I would like to stress now is that this particular implementation depends on the additive view of lexical insertion we have discussed in the previous subsection. Effectively, adding an ellipsis diacritic in the syntax is forced by this conception but also by other assumptions regarding the spell-out of E-sites. Concretely, I am assuming here that E-sites are active objects at PF; i.e., they are syntactically spelled-out. The reason for this assumption is that abstract morphemes, even when elliptical, are still active for some morpho-phonological processes (concord, for instance).

Suppose now that we adopt the replacive view on lexical insertion, according to which every syntactic terminal contains a free variable that is replaced for a phonological exponent at PF. On this conception, ellipsis can be seen as *Q*-deletion in the syntax. Like in the *I*-Assignment system, the procedure goes bottom-up starting for the most embedded phrase and deletes the *Q*-

feature of the terminal nodes that project such a phrase. The final result of each instance of *Q*-deletion is given in (38), where angle brackets indicate successful applications of *Q*-deletion:



An important formal difference between *I*-Assignment and *Q*-deletion is that, by definition, syntactic *I*-Assignment doesn't affect terminal nodes but their phrasal labels. Such a strategy cannot be extended in obvious ways to the *Q*-deletion procedure since the *Q* variable is an inherent property of terminal nodes. This seems to be harmless, though, because the way in which identity is calculated under both approaches remains the same. There are, however, two conceptual arguments that militate in favor of the *Q*-deletion view of ellipsis. First, the *Q*-deletion approach dispenses with the need for any particular definition of Lexical Insertion Blocking. Deleting a *Q*-feature automatically blocks the substitution operation implied by the replacive approach to lexical insertion. The *I*-Assignment mechanism requires, instead, a definition like (37), which is introduced with the sole purpose of blocking vocabulary insertion. Second, the replacive view complies, without any further ado, with Inclusiveness (i.e., the ban of introducing features in narrow syntax that are not present in the initial numeration, Chomsky 1993), whereas the *I*-Assignment either is incompatible with it or needs further assumptions in order to make the system compatible with Inclusiveness. While I don't think these considerations are conclusive or fatal for the *I*-Assignment theory, I will adopt the *Q*-deletion strategy and make the relevant comparisons between the two systems when relevant. As we will see, a definition like (37) has some beneficial implications that cannot be automatically deduced under the *Q*-deletion approach.

To sum up, in (39) I list some of the key features of the theory of ellipsis discussed so far.

- (39)
- a. Phrasal ellipsis applies in the syntax; i.e., before lexical insertion and other relevant morphological operations.
 - b. Assuming the replacive view of lexical insertion, ellipsis is just *Q*-deletion under a formal identity condition.
 - c. Given a phrasal E-site, identity is calculated for every terminal node from the bottom-up starting from the most embedded phrase of such an E-site; i.e., identity doesn't require structural identity (see also Rudin 2018 for a similar view).

In the two next sections, I further elaborate on the *Q*-deletion theory and show how both the sprouting cases and the inflectional mismatches cases cease to be problematic for a syntactic approach to identity in ellipsis.

3. Timing issues #1: interactions between copy deletion and surface anaphora

3.1. On the distribution of phrasal copies within E-sites

Recall that both sprouting and contrast sluicing constitute a crucial challenge for syntactic isomorphism:

- (40) a. She's reading. I can't imagine what.
 b. He shouted again, but I don't know to whom/who to.
 c. They're going to serve the guests, but it's unclear what.
[Chung *et al* 1995: 242]
 d. Joan ate dinner but I don't know with whom.
[Chung *et al* 1995: 246]

- (41) John has five cats but I don't know how many dogs.
[Merchant 2001: 36]

In reality, both (40) and (41) are part of a broader generalization, namely that traces of phrasal copies doesn't count when it comes to calculating identity for a given E-site. In addition to examples like these, where traces of A-bar movement are irrelevant, it is worth noticing to mention here that traces of A-movement are irrelevant, as well:

- (42) a. John was [punished <John>] and Bill was too <punished <Bill>>.
 b. John seems [<John> to be sick] and Bill does too <[seem <Bill> to be sick]>.

An obvious difference when we compare (40)/(41) with (42) is that while in (40)/(41) the trace in the antecedent doesn't have a parallel trace within the antecedent, the traces in the E-sites in (42) do have a parallel trace within the corresponding antecedents. Examples like (42), then, seem to respect syntactic isomorphism, under well-known assumptions regarding the behavior of bound variables in ellipsis. Concretely, variables bound from parallel positions in the A and the E-site would give rise to licit ellipses (see Griffiths & Lipták 2014, Thoms 2015 and Gribanova 2018). Thoms (2015) makes the additional claim that “a variable cannot provide for ellipsis of a non-variable” (Thoms 2015: 16). Yet, such a claim is disconfirmed by empirical evidence. Consider the following sluicing cases in Spanish:

- (43) a. A María, la voy a ver aunque no
 DOM M. her go.1SG to see.INF although not
 sé cuándo < la voy a ver (a María)>.
 know.1SG when her go.1SG to see.INF DOM M.
 ‘(As for) Mary, I will see her, but I don't know when.’
 b. El departamento sabe a qué profesor contratar,
 the department knows DOM what professor hire.INF
 pero no sabe cuándo < contratarlo>.

but not knows when hire.INF-him
‘The department knows which professor to hire, but doesn’t know when.’

In (43a), A has a variable left by topic movement of the direct object, whereas in (43b) A contains a *wh*-variable. However, the relevant E-sites don’t containing parallel bound variables. Consider a simplified underlying structure for (43b), where it can be seen that ellipsis is licit even when the *wh*-trace in A doesn’t have a corresponding bound variable in the E-site, but a free pronoun:

- (44) ... sabe [a qué profesor [contratar < a qué profesor>]],
 knows DOM what professor hire.INF DOM what professor
 pero no sabe [cuándo <[contratarlo < cuándo>]>].
 but not knows when hire.INF-him when

So, an explanation for (42) in terms of parallel bound variables doesn’t generalize to each case involving different distribution of traces in As and E-sites. Taking into consideration the entire paradigm emerging from (40)-(43), and adding regular cases of sluicing (*John saw someone. Guess who*), we can give a more complete picture of the distribution of phrasal traces in As and E-sites. A trace of an ellipsis remnant that has escaped the E-site can have different types of correlates in A and a trace within A can indeed license a non-variable (a non-trace) in the corresponding position within the E-site:

(45)	<i>Antecedent</i>	<i>E-site</i>
<i>Sprouting (40)</i>t...
<i>Contrast Sluicing (41)/VP-ellipsis (42)</i>	...t...	...t...
<i>Sluicing (43)</i>	...t...	<i>pro</i>
<i>Regular sluicing (1c)</i>	...indef...	...t...

This picture makes clear that syntactic isomorphism/parallelism cannot be on the right track. But in addition it also informs us about the distribution of traces in As and E-sites.

One of the most important challenges for the theory of ellipsis is offering a good explanation of why, then, traces of maximal phrases within E-sites are irrelevant when it comes to calculating identity. The copy theory of movement as originally proposed by Chomsky (1993) and (1995) offers an interesting solution. Chomsky himself pointed out that ellipsis and copy deletion would be part of same natural class of phenomena. He suggests that if E-sites are interpreted as copies of their antecedents (i.e., an E-site is marked with a particular diacritic) by the computational system, then

It will follow [...] that the copy deletes [he refers to the E-site, AS], by *whatever mechanism* deletes traces in the phonological component. (Chomsky 1995: 253, my emphasis)

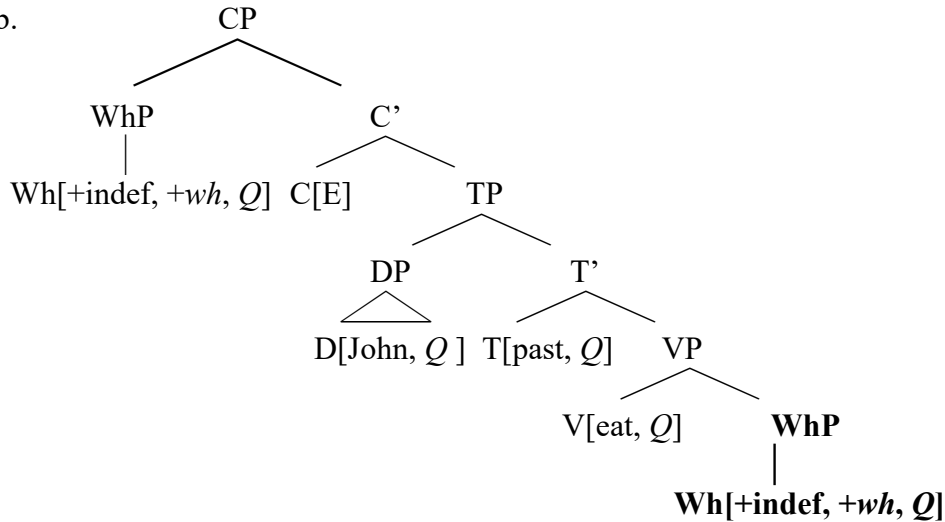
In other words, surface anaphora and copies left by movement are subtypes of the same phenomenon.³ In Saab (2008) I proposed that the “whatever mechanism” referred in the above

³ In Chomsky (1993) the relation goes in the opposite way: copies reduce to ellipsis. See Nunes (2004) for a discussion of both alternatives.

quote was *I*-Assignment. I would like to explore now an alternative in terms of *Q*-deletion, but noticing that, at least for this particular empirical domain, my choice is only made by the conceptual considerations raised in the previous section. As far as I can tell, both alternatives are extensionally equivalent as far as the distribution of copies in As and E-sites is concerned. Let's see then how this approach derives the paradigms in (40)-(43), starting with the sprouting cases.

Following Merchant (2001), I assume that sluicing deletes a TP whenever such a TP is selected by a C head that is specified with an E feature. Movement of the *wh*-remnant leaves a copy within the E-site. For a sluice sentence like (46a), the abstract representation prior to copy deletion and TP-deletion would be essentially as shown in (46b):

- (46) a. John ate but I don't know what.
b.



I assume that, if certain conditions are met, *Q*-deletion for copies applies before of *Q*-deletion of E-sites. As for the conditions that syntactic copy deletion must satisfy, there are basically two: (i) identity and (ii) c-command. Identity among chain links depends on one's view about the very nature of copies (among other options, as the result of a particular copy operation, Chomsky 1993, Nunes 2004, Muñoz-Pérez 2017; as syntactically-defined occurrences of a single syntactic object, Chomsky 2000, 2001), so I simply assume here that Chains are subject to some identity requirement (perhaps, inclusion as defined in Muñoz-Pérez 2017). With Chomsky (2000), I adopt the most traditional view of c-command in terms of sisterhood:

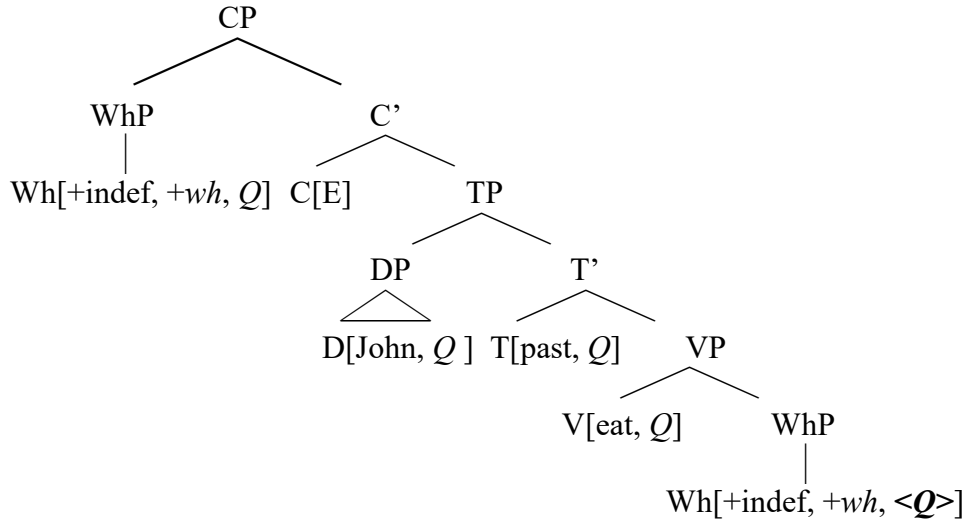
- (47) [...] α c-commands β if α is a sister of K that contains β . (Chomsky 2000: 116)

With this in mind, we can state the conditions for this variety of *Q*-deletion as follows:

- (48) Given a two-membered chain CH with Links $\{L', L\}$ delete every *Q*-feature contained in L if and only if,
a. L' and L are formally identical
b. L' c-commands L .

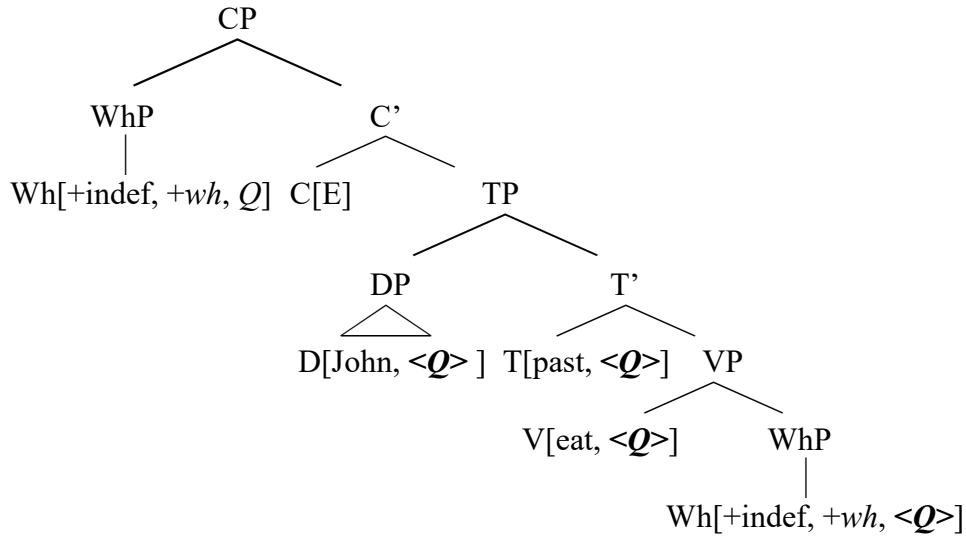
With reference to our sprouting case in (46a) and its associated tree in (46b), the Q -feature of the lower copy of the *wh*-remnant is deleted, since both identity and c-command are met.

(49)



Now, once an antecedent TP is found for the E-site, Q -deletion applies in a bottom-up fashion starting from the most embedded phrase. In this case, however, the Q -feature of the relevant phrase has been already deleted by a previous instance of Q -deletion and, as a consequence, checking identity with a corresponding phrase in the antecedent becomes an entirely vacuous step. The procedure then moves to the next relevant phrases and checks identity for every relevant head contained in the E-site. Since in these cases identity is ensured for each head, all the Q -features associated to such heads are consequently deleted:

(50)



This view implies that phrasal copies are never in the need for a corresponding phrase in the antecedent. The prediction is that whenever a phrase move to a c-commanding position, Q -deletion automatically applies to its lower copy rendering any further instance of Q -deletion superfluous. On this theory, all what is required is that each Q -feature within the E-site be deleted by some instance of Q -deletion. Whenever there is no movement of a given XP out of the

E-site, identity between this XP and a corresponding phrase within the antecedent is needed in order to ensure *Q*-deletion for the head of XP. Beyond sprouting, this generalizes to regular sluicing with indefinite correlates (1c), contrast sluicing (41), and the VP-ellipsis cases in (42). As for examples like (43), where a trace serves as a correlate of a pronoun or R-expression, the system proposed here also offers a natural account: *wh*-movement in the antecedent sentence deletes the *Q*-feature of the lower copy of the displaced constituent but leaves its set of syntactic-semantic features and Root information unaltered; therefore, the pronoun in the E-site can take such a lower copy as its antecedent. Since that, modulo Vehicle Change (Fiengo & May 1994), identity is satisfied, *Q*-deletion applies deleting every *Q*-feature contained in the pronoun. In turn, the trace of the *wh*-adjunct doesn't need for a correlate in the antecedent, because a prior instance of *Q*-deletion has deleted its *Q*-feature. In (51), I provide a simplified representation, in which each relevant instance of *Q*-deletion in the E-site appears between angled brackets.

- (51) sabe [a qué profesor [contratar <a **qué** **profesor**>],
 knows DOM what professor hire.INF DOM what professor
 pero no sabe [cuándo <[contratar<lo> <cuándo>]>].
 but not knows when hire.INF-him when

In summary, I have demonstrated that the *Q*-deletion approach handles the distribution of traces within E-sites in entirely syntactic terms, i.e., under a theory of identity that makes reference only to syntactic objects built up from abstracts morphemes and Roots taken from List 1. Perhaps, it becomes as a surprise that this system is not only compatible with the entire set of data discussed so far, but it is also superior to semantic approaches that take the sort of lack of syntactic isomorphism seen in sprouting as a robust indication in favor of a semantic identity condition for ellipsis. However, it turns out that many cases of sprouting cannot be derived under mutual entailment (or relatives) without further ado. Consider the following examples of adjunct sprouting from Barros & Kotek (2019) (see also Anderbois 2014 and reference therein):

- (52) Sally left, but I don't know {in which car, with whom...}

Merchant's mutual entailment cannot ensure the right result here, since the proposition in the antecedent (i.e., that Sally left) doesn't entail the proposition expressed in the elliptical sentence (i.e., that Sally left with someone or that Sally left in a certain car). It doesn't follow directly under Barros & Kotek's similar account, according to which ellipsis is licensed whenever there is a salient antecedent A with same the focus-theoretic propositional content as the E-site. In simple terms, this condition can be stated as follows:⁴

- (53) $U[\llbracket CP_A \rrbracket^f] \leftrightarrow U[\llbracket CP_E \rrbracket^f]$ [Barros & Kotek 2019: 6]

As it happens to Merchant's account, the condition in (53) doesn't give good results in examples like (52) (see Chung *et al* 2010 for related examples), since the set of worlds in the antecedent (i.e., λw . Sally left in w) contains worlds where Sally didn't leave with anyone:

- (54) a. Sally left but I don't know who with.

⁴ Read it as: the set of worlds used to construct the alternatives in $\llbracket CP_E \rrbracket^f$ is equivalent to the set of world used to construct alternatives in $\llbracket CP_A \rrbracket^f$.

$$b. \{w: \text{Sally left in } w\} \neq \bigcup \{\lambda w. \text{Sally left with } x \text{ in } w \mid x \in D_e\}$$

Barros & Kotek, then, appeals to a process of accommodation, along the lines proposed by Lewis (1979):

(55) **Accommodation (Lewis 1979: 340):**

If at time t something is said that requires presupposition P to be acceptable, and if P is not presupposed just before t , then, *ceteris paribus* and within certain limits, presupposition P comes into existence at t .

The sluice sentences in (52) trigger the presupposition that the relevant leaving-events include a companion or a car. Such a presupposition then removes from the antecedent denotation worlds inconsistent with it. As Barros & Kotek notice, this sort of accommodation is not a trait of their proposal, but is required for any semantic account. Yet, I add to this claim that the syntactic approach I'm defending here doesn't require any additional accommodation process but instead provides a uniform analysis for every type of sprouting and, beyond sprouting, for any E-site containing phrasal copies. Whether such a uniform approach should be preferred over an approach using mutual entailment (or relatives) + accommodation depends on whether relevant experiments can be constructed in order to detect the sort of accommodation that is predicted by Barros & Kotek in a subset of sprouting cases. As it stands, the appeal to accommodation remains as an internal fix for semantic approaches. But even if one is willing to accept the fix, there is still a set of facts that cannot be derived under the semantic + accommodation approach. These facts also involve sprouting.

Concretely, Pujalte (2012, 2013) shows that added datives in Spanish don't tolerate sprouting of the added argument. A verb like *cortar* 'to cut' only requires an internal argument. Yet, like any transitive structure, a benefactive argument can be added through the introduction of a dative DP (see also Masullo 1992 and Cuervo 2003). Of course, a benefactive participant introduced by preposition *para* 'for' is licit as well.

- (56) a. Juan cortó el pasto.
 J. cut the grass
 b. Juan le cortó el pasto a Pedro.
 J. CL.DAT.3SG cut the grass to P.
 c. Juan cortó el pasto para Pedro.
 J. cut the grass for P.
 'Juan cut the grass for Pedro.'

Interestingly, Pujalte notices that whereas adjunct sprouting is possible, sprouting of the dative argument is illicit:

- (57) A: Juan cortó el pasto.
 J. cut the grass
 B': A quién le cortó el pasto?
 to whom CL.DAT.3SG cut the grass
 B'': ?? A quién.

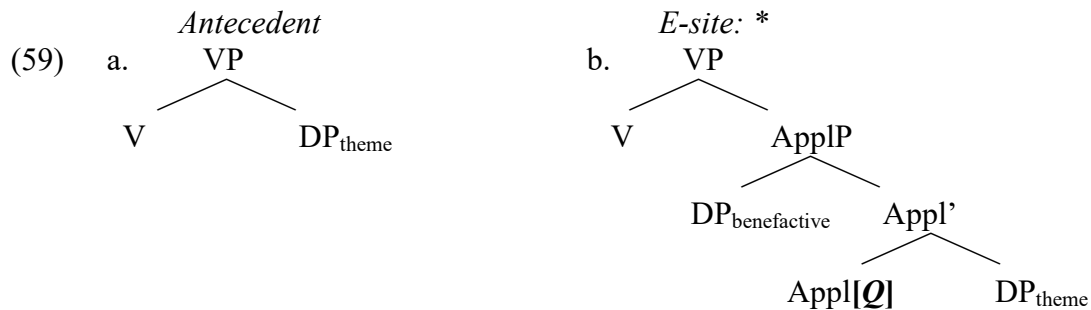
	to	whom
B''':	Para	quién.
	for	whom

The sharp contrast between the adjunct sprouting in (57B'') and the sluice in (57B') is problematic for Barros & Kotek's proposal. In both cases, the condition in (53) is not met, as shown in (58):

- (58) a. Juan cortó el pasto
 = { w : John cut the grass in w }
 ≠
 b. Juan cortó el pasto {a alguien, para alguien} =
 $\cup \{\lambda w. \text{John cut the grass for } x \text{ in } w \mid x \in D_e\}$

Accommodation should then remove from consideration irrelevant worlds in the antecedent (for instance, worlds where John cut the grass for the benefit of no person). However, accommodation only licenses adjunct sprouting.

In contradistinction, the analysis I'm defending deals with these examples without any additional stipulation. According to Cuervo, Pujalte and others, added datives in Spanish are introduced by low applicative heads (Pyllkänen 2002, 2008). It follows, then, that the E-site in the sluice in (57B'') contains a head, the Appl head, that doesn't have a corresponding head within the antecedent. The Q -feature of the theme DP in the E-site is deleted under identity with the theme DP in the antecedent, and the Q -feature of the lower of copy of the benefactive DP is deleted under identity and c-command with its higher copy. Yet, the Appl head itself doesn't have a corresponding head in the antecedent and the derivation is cancelled immediately this failure obtains



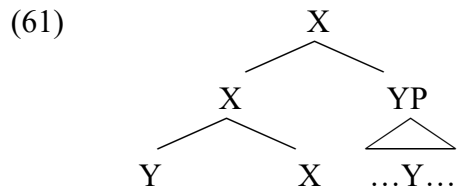
The adjunct sprouting sluice follows in the same way as any other case of sprouting. In summary, in order to obtain good results for our entire paradigm the semantic + accommodation approach must be supplemented with an identity condition making reference to formal identity. As mentioned in the introduction, while I don't deny that a complete theory of ellipsis could include semantic or pragmatic ingredients, for the cases analyzed so far, at least, a Q -deletion approach alone is able to do the entire job. Lacking evidence for the contrary, I contend then that the Q -deletion approach is superior to the semantic + accommodation (+ syntactic?) approach.

3.3. On the distribution of head copies within E-sites

Like the *I*-assignment system I developed in Saab (2008), the *Q*-deletion model for ellipsis makes a further prediction regarding the distribution of copies within E-sites. Recall that *Q*-deletion of lower copies in the syntax requires c-command.

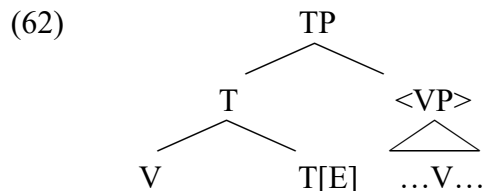
- (60) Given a two-membered chain CH with Links $\{L', L\}$ delete every *Q*-feature contained in L if and only if,
- L' and L are formally identical
 - L' c-commands L.

The c-command condition becomes crucial when considering possible movement dependencies that don't involve c-command in the defined sense (as sisterhood). Syntactic head adjunction is, of course, the first one that comes to mind (Travis 1984, Baker 1988, among many others). Consider the following abstract representation of head adjunction:



Here, the higher head copy doesn't c-command its lower copy. This raises several questions regarding crucially the distribution of head copies in ellipsis and the way in which head copies are deleted. These and related questions are discussed in depth in Saab (2008) in the framework of the *I*-Assignment system. Here, I briefly discuss some of the implications that arise from a system with head adjunction and *Q*-deletion as operations of grammar.

Let's start with the question about the interaction between head movement and ellipsis. The relevant empirical domain is constituted by languages that have V-stranding VP-ellipsis (e.g., Irish, Hebrew, Portuguese, Russian, Greek, Hungarian; see McCloskey 1991, 2004, 2012, Goldberg 2005, Cyrino & Matos 2002, 2005, Saab 2008, Lipták 2012, 2013, Lipták & Saab 2014, Gribanova 2013a,b, 2018, Merchant 2018, among others). In the abstract, a V-stranding VP ellipsis scenario would have the following form:⁵



V to T movement doesn't trigger an instance of *Q*-deletion for the lower V head; consequently, the V head in the E-site must find an identical head in the antecedent. The prediction is that head

⁵ I use the labels T or V as convenient devices. A more adequate term for the phenomenon we are exploring could be X-stranding XP-ellipsis, where X stands for different categories.

copies obey identity. This is correct for a subset of the languages that show V-stranding VP-ellipsis:

Portuguese:

- (63) a. Quando a Ana pôs os óculos na mesa,
when the A. put the glasses on-the table,
a Maria também pôs < os óculos na mesa>.
the Maria too put the glasses on-the table.
'When Ana put the glasses on the table, Maria did too.'
- b. * Quando a Ana colocou os óculos na mesa,
when the A. placed the glasses on-the table,
a Maria também pôs < os óculos na mesa>.
the M. too put the glasses on-the table
[Cyrino & Matos 2002: 6]
- (64) a. O Luís foi à biblioteca às nove horas
the Luís went to.the library at nine o'clock a
e o Pedro também foi < ____ >.
and the P. too went
'Luís went to the library at nine o'clock and Peter did, too'.
(EP/BP)
- b. *O Luís chegou à biblioteca às nove horas
the L. arrived at.the library at.the nine o'clock
e o Pedro também foi < ____ >.
and the Pedro too went
(____ = [foi] à biblioteca às nove horas) (EP/BP)
[Cyrino & Matos 2005: 9]

Irish

- (65) a. A: A-r bhain tú sult as? B: Bhain.
INTERR[PAST] take you fun from-it took
A: 'Did you enjoy it?' B: 'I did.'
- b. A: A-r enjoy-áil tú é? B: *Bhain.
INTERR[PAST] enjoy you it took
A: 'Did you enjoy it?' B: 'I did.'
- c. *Níor cheannaig siad ariamh teach ach dhíol.
NEG.PAST bought they ever house but sold
'They never bought a house but they sold (a house)'. (McCloskey 2004)

Hebrew:

Context: Dvora is pregnant and has many errands to do; Miryam, who has a car but is sometimes inconsiderate, is supposed to be helping her.

- (66) Q: (Ha'im) Miryam hevi'a et Dvora la-xanut?
Q Miryam bring[Past3Fsg] ACC Dvora to.the-store
'(Did) Miryam bring Dvora to the store?'
- Ai: Ken, hi hevi'a.
yes she bring[Past3Fsg]

‘Yes, she brought <Dvora to the store>.’
 Aii: * Ken, hi lakxa.
 yes she take[Past3Fsg]
 ‘Yes, she took <Dvora to the store>.’
 Aiii: * Lo— hi ŠALXA!
 no she send[Past3Fsg]
 ‘No—she SENT <Dvora to the store>!’

(Goldberg 2005: 160)

V-stranding ellipsis in these languages is licit only if there is strict identity between the V head in the antecedent and in the E-site. Importantly, Goldberg (2005) shows that there no is pragmatic constraint in the cases she analyses, since the non-elliptical counterpart of (66Aii) and (66Aiii) renders the sentences perfectly grammatical:

(67) Q: (Ha'im) Miryam hevi'a et Dvora la-xanut?
 Q Miryam bring[Past3Fsg] ACC Dvora to.the-store
 ‘(Did) Miryam bring Dvora to the store?’
 Ai: Ken, hi hevi'a ota.
 yes she bring[Past3Fsg] ACC.her
 ‘Yes, she brought her.’
 Aii: Ken, hi lakxa ota.
 yes she take[Past3Fsg] ACC.her
 ‘Yes, she took her.’
 Aiii: Lo— hi ŠALXA ota!
 no she send[Past3Fsg] ACC.her
 ‘No—she SENT her!’

(Goldberg 2005: 161)

Goldberg also notices that the paradigm in (66) possesses a challenge for the semantic theory proposed in Merchant (2001) (also assumed in her work). In her words:

Empirically, [...], focusing the Vs does *not* have the effect of making their non-identity licit. This can be seen in examples like [66Aiii], [...], in which non-identical Vs with identical argument structures are focused, and yet are still ungrammatical in V-Stranding VPE. (Goldberg 2005: 185)

In order to derive head strict identity effects, she proposes an additional constraint on V-stranding ellipsis, which is formulated as follows:

GIVEN-ness Constraint on the Heads of Elided Constituents:

(68) The head of the constituent targeted for deletion must be semantically GIVEN (in the sense of Schwarzschild 1999).
 (Goldberg 2005: 182)

Goldberg concludes that even though this additional constraint doesn’t make mutual entailment worse than other theories she discusses (LF copy theories), is, indeed an *ad-hoc* requirement. Crucially, as I have shown, the behavior of head copies in these languages conforms to the expectations of the theory of this paper (see Saab 2008 for extensive discussion). This having said, there are, however, another subset of V-stranding VP-ellipsis languages where verbal

mismatches are allowed if the verbs contrast (among others, Russian, Hungary and Greek). One of the best studied cases is Russian, particularly, thanks to the research of Vera Gribanova in several studies. Gribanova (2018), for instance, presents a detailed comparison between Irish, a language that, as I have indicated above, doesn't allow for verbal mismatches, and Russian. In this language, the said mismatch is particularly allowed in the discursively marked VSO order whenever the stranded verb bears lexical focus. In neutral SVO orders, V-stranding is licensed but verbal lexical identity must be respected, as shown by the contrast between (69) and (70):

- (69) a. Evgenija otpravila posylku v Mosku?
 E. send.PAST.SG.F package.ACC to M.
 'Did Evgenija send the package to Moscow.'
 b. Ne otpravila / Otpravila.
 no send.PAST.SG.F send.PAST.SG.F
 'She didn't / she did.'
- [Gribanova 2018:2]
- (70) a. Paša poterjal knigu v biblioteke,
 P. lose.PAST.SG.MS book.ACC in library.PREP
 i žurnal v stolovoj?
 and magazine.ACC in cafeteria.PREP
 'Did Pasha find a book in the library, a magazine in the cafeteria?'
 b. *Da, poseja.
 yes lose.PAST.SG.MS
- [Gribanova 2018:13]

As mentioned, VSO order in the antecedent and contrastive focus on the verbal remnant render a verbal identity mismatch licit:

- (71) a. Našel li Paša poterjal knigu v
 find.PAST.SG.MS Q P. lose.PAST.SG.MS book.ACC in
 biblioteke, i žurnal v stolovoj?
 library.PREP and magazine.ACC in cafeteria.PREP
 b. No, ne našel, a poterjal.
 no NEG find.PAST.SG.MS but lose.PAST.SG.MS
 'No, he didn't find (...), but he lost (...).'
 c. Našel, no potom poterjal
 find.PAST.SG.MS but then lose.PAST.SG.MS
 'He did (...), but then he lost (...).'
- [Gribanova 2018:13]

The answer Gribanova gives assumes the theory of head movement recently developed in Harizanov & Gribanova (2018), according to which several phenomena traditionally conceived of under the rubric *head movement* decompose in two clearly distinct phenomena, namely (i) syntactic movement akin to phrasal movement, and (ii) amalgamation, a term that covers both raising and lowering at PF. An in-depth critical review of this proposal cannot be given here. Let me just briefly mention the gist of Gribanova's analysis for the relevant data. Following previous analyses of the verbal identity requirement (McCloskey 2004, Schoorlemmer & Temmerman

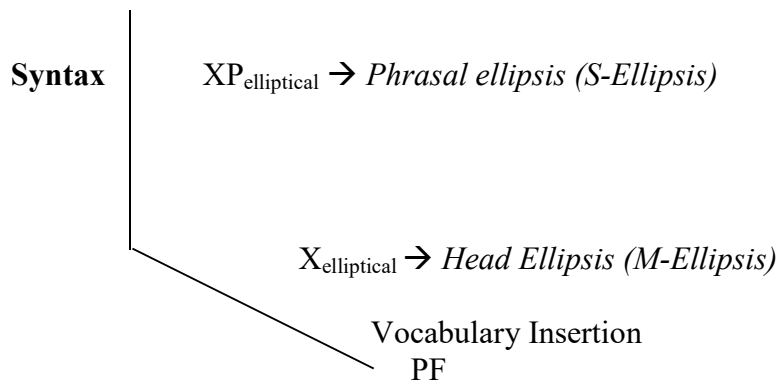
2012, among others, and Lipták 2012 for a criticism), she proposes that constructions obeying the verbal identity requirement involves amalgamation at PF. Thus, in the syntax the surface stranded verb stays within the E-site and, consequently, it must respect verbal identity as any other constituent inside an E-site. On the contrary, constructions in which verbal identity is not operative involve syntactic movement; crucially, this movement is not syntactic head adjunction (a disallowed option in Harizanov & Gribanova's system), but a type of movement with all the relevant properties of syntactic phrasal movement, maybe of the head to Spec type (as proposed in Vicente 2007 and others).

As discussed in detail in Saab (2008), the PF account of head movement is perfectly compatible with the *I*-Assignment system, as it also fully compatible with the *Q*-deletion approach. Now, notice that Gribanova's account of the verbal identity mismatches in Russian (and related languages) meets the expectations of the *Q*-deletion/*I*-Assignment theory, as well. If syntactic head movement of focused heads targets specifier positions⁶, then the c-command condition for *Q*-deletion is satisfied and, therefore, verbal mismatches are correctly predicted as licit. It is a welcome result for the *Q*-deletion approach that the particular behavior of head traces within E-sites doesn't depend on particular assumptions about the proper nature of head movement, a topic that, as is well-known, is at the center of many current debates (Matushansky 2006, Harizanov & Gribanova 2018 and Arregi & Pietraszko 2018, among others). In addition, there are still several poorly understood issues regarding the scope of X-stranding ellipsis within and across languages. For instance, it is a matter of debate what X-stranding ellipsis languages allow for deviations of the verbal identity condition, Portuguese being a prominent case (Cyrino & Matos 2002, 2006 and Santos 2009 provide contradictory evidence). The difficulty lies in possible confounding factors connected to certain surface overlapping between V-stranding ellipsis and the phenomenon of argument drop. Moreover, it is not entirely clear why a language like Hungarian, which has both particle-stranding and V-stranding ellipsis, permits verbal mismatches but not particle mismatches (Lipták 2012, 2013 and pers. comm.). The problem is particularly puzzling because, as argued by Lipták (2012), stranded particles in Hungarian behave as maximal phrases, contra the expectations in Schoorlemmer & Temmerman (2012), Gribanova (2018) and my own expectations here and in Saab (2008). More comparative research should shed light on these and related issues.

Summing up, the verbal identity condition in V-stranding ellipsis follows both under syntactic or PF analyses of head movement. Now, the syntactic approach owes an explicit account of how head traces are deleted. In Saab (2008), I argued that head traces are deleted at PF under well-known locality conditions of that level (immediate locality and adjacency), forming thus a natural class of phenomenon with other varieties of head deletion. This gives us a particular model for the timing of ellipsis, which is illustrated in (72):

⁶ Arguably, due to scope reasons.

(72) Numeration



The sort of properties emerging from this model is studied in detail in Saab (2008), but some of them can be briefly mentioned here:

- (73) A. S-ellipsis only targets phrases; M-ellipsis only targets MWs.
 B. S-ellipsis respects syntactic locality constraints (c-command, selection); M-ellipsis respects morphological locality conditions (adjacency, immediate locality).
 C. S-ellipsis cannot be fed by post-syntactic operations; M-ellipsis can. (see section 5)

We have already seen some the properties that S-ellipsis has. I'll turn now my attention to some core properties of M-ellipsis and expand the empirical domain in section 5 in order to illustrate some features of the theory. The final picture is an integral theory of the timing of deletion in grammar whose empirical coverage extends far beyond traditional surface anaphora.

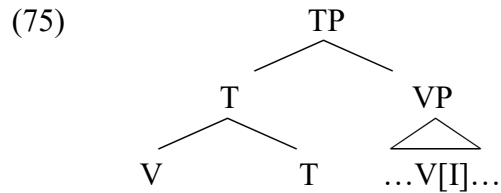
3.3. On head ellipsis

In Saab (2008), I define head ellipsis in terms of the *I*-Assignment system as follows:

Head Ellipsis (under I-Assignment):

- (74) Given a Morphosyntactic Word (MW) X^0 , assign an [I] feature to X^0 if and only if there is a node Y^0 identical to X^0 contained in an MW *adjacent* or *immediately local* to X^0 (where the notion of *containment* is reflexive).

The locality conditions stated in the definition are the same conditions that are observed in morphological displacement, according to the model of post-syntactic movement defended in Embick & Noyer (2001) and Embick (2007). These movement operations are Lowering and Local Dislocation. The former applies before linearization and under immediate locality, i.e., locality between a head and the head of its complement (e.g., English affix hopping). Local Dislocation, instead, applies after Linearization and under adjacency (e.g., comparative/superlative formation in English). Thus, the disjunction in the definition in (74) derives from the timing of morphological operations and doesn't need to be stipulated. A typical head adjunction configuration like (75) feeds immediate locality and, since both verbal heads are identical, *I*-Assignment to the lower copy successfully applies.



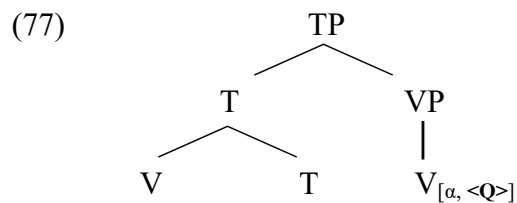
Part of the basic effects of the definition in (74) can be easily translated to a corresponding definition under the *Q*-deletion approach. Let's then propose the following definition:

(76) Head Ellipsis (under *Q*-deletion):

Given a morphosyntactic word MW, delete every *Q*-feature contained in MW if and only if:

- (i) There is an identical antecedent contained in a morphosyntactic word MW',
- (ii) MW is adjacent or immediately local to MW'

With reference to the tree in (75), *Q*-deletion deletes the *Q*-feature encoded on the lower verbal copy.



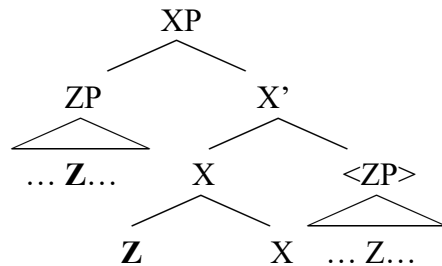
Both definitions capture some crucial properties of head ellipsis that distinguish it from phrasal ellipsis. Consider, in this respect, VP-topicalization in English, involving remnant movement of the *v*P:

- (78) John said that he would clean the house,
and [*<he>* clean the house] he did *<[<he>clean the house]>*.

Here the subject vacates its base position and ends in Spec,TP, a position from which it c-commands its trace. Since that both identity and c-commands is met, *Q*-deletion deletes the *Q*-features of the subject DP. Remnant movement of the *v*P to a topic position triggers another instance of *Q*-deletion for the *v*P copy. As expected, only the copy in Spec,TP is subject to vocabulary insertion at PF.

In contradistinction, a remnant structure involving head extraction for the remnant phrase should lead to double pronunciation of the two higher heads, as shown in the abstract structure in (79):

(79)



The reason should be evident: extracting a head via head adjunction leads to a configuration in which the moved head doesn't c command its trace. In turn, additional remnant movement of ZP will end in a situation where each *Q*-features is deleted in the lower ZP trace, but the two remaining head copies are not in the required immediate locality relation that licenses head deletion. This abstract situation is indeed instantiated in certain predicate fronting constructions in Romance I studied in Saab (2008, 2017):

(80) *Río de la Plata Spanish*

Vino Juan, **vino**.
came J. came
'John came!'

(81) *Italian*

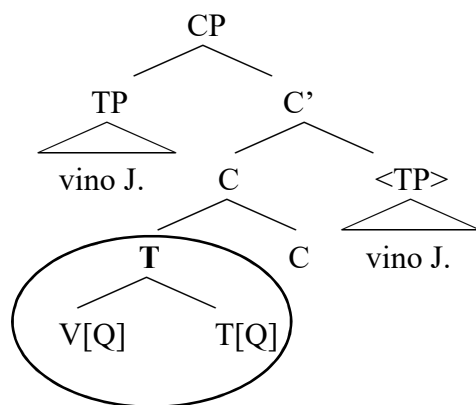
a. **È andato** a Parigi, **è andato**.
is gone to Paris is gone
'He really did go to Paris.'

[Gulli 2003: 3]

b. **Mangia** la pizza, **mangia**.
eats the pizza eats
'He really is eating the pizza.'

The derivation of these sentences involves the same crucial steps that are abstractly represented in (79), namely, head adjunction plus remnant movement of some constituent containing the original head trace:

(82)



As mentioned, the two higher links of *vino* don't stand either in a c-command configuration or in an immediate locality one. Crucially, notice that they are not in an adjacent relation, either. If they were, head deletion would apply after linearization. As discussed at length in Saab (2008,

2017) verbal doubling of the Italian or Rioplatense type leads to strong ungrammaticality, a fact predicted by the present approach:

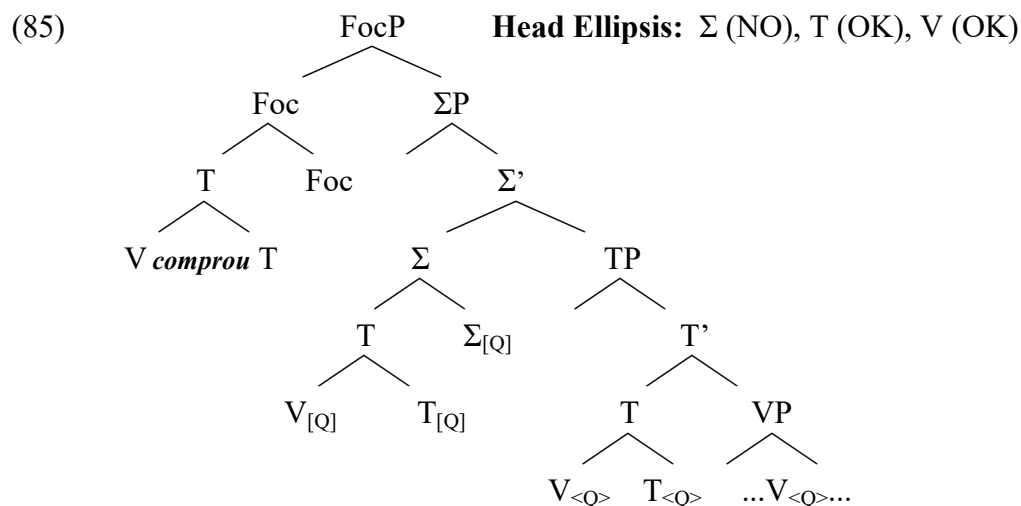
- (83) a. * Vino, vino.
 came came
 b. * Mangia, mangia.
 eat eat

In addition to instantiate the anti-adjacent verbal doubling structure, European Portuguese also allows for adjacent verbal doublings of the following type (see Martins 2007, 2013):

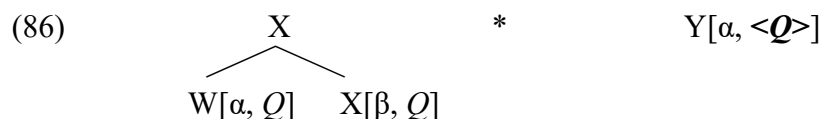
- (84) *European Portuguese*
A: O João não comprou o carro, pois não?
 the J. not bought the car, *pois* NEG
 ‘John didn’t buy the car, did he?’
B: **Comprou, comprou.**
 bought, bought
 ‘Yes, he DID.’

[Martins 2007: 81]

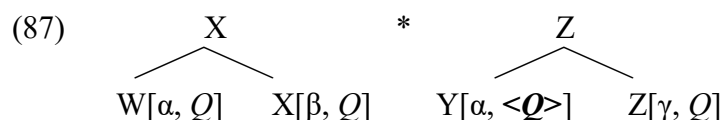
According to Martins, the answer in (84B) involves an instance of V-stranding ellipsis (or T-stranding), a typical treat of the language, plus several instances of head movement. The last step of head movement, however, is implemented through T excorporation from Σ to Foc. The output structure is illustrated in (85):



Taking this analysis for granted, double head pronunciation derives as a side effect of excorporation, which outputs a configuration in which identity for the Σ head, the target of *Q*-deletion, is not met because Σ itself doesn't have a matching head in its antecedent, the **Foc** head. Interestingly, the *I*-Assignment approach gives the same final result for similar reasons, even when *I*-Assignment makes reference to MWs as the maximal domain of grammatical deletion. The theories, however, diverge in other respects. Suppose, for instance, that *Q*-deletion applies to two adjacent MWs (* = linearization statement):



Here, W serves as an antecedent for deletion of the Q -feature Y possesses. Now, suppose that Y becomes a subword for some further morphological operation that adjoins it to another head Z (or X itself):



This should lead to a situation where Z is pronounced but Y is not. Under the I -Assignment system, instead, Y and Z are both subject to Vocabulary Insertion. Let's see why. Recall that Vocabulary Insertion Blocking makes reference to MWs as the minimal domain of blocking:

VI-Blocking (VIB):

- (88) Vocabulary Insertion does not apply in the domain of X^0 , X^0 a MW, if X^0 , or some projection of X^0 , is specified with a $[I]$ -feature.

Associated definitions:

- (i) The domain of X^0 , X^0 a MWd, is the set of terminal nodes reflexively contained in X^0 .
Morphosyntactic word
- (ii) At the input to Morphology, a node X^0 is (by definition) a *morphosyntactic word* (MWd) iff X^0 is the highest segment of an X^0 not contained in another X^0 .
Subword
- (iii) A node X^0 is a *subword* (SWd) if X^0 is a terminal node and not an MWd.

[(ii) and (iii) from Embick & Noyer 2001: 574]

As a corollary of the theory of VIB, no subword SW can be deleted with independence of the MW that contains SW. This is dubbed *Subword Deletion Corollary* in Saab (2008). Informally, it can be formulated in the following way:

- (89) *Subword Deletion Corollary* [adapted from Saab 2008: 375]

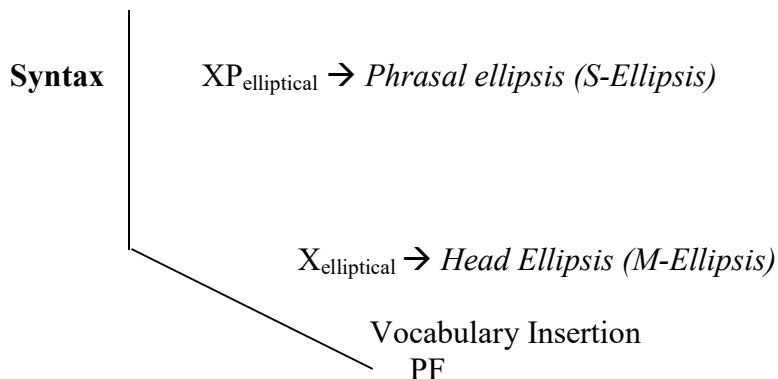
Given a subword X^0 , X^0 can only be deleted if the morphosyntactic word containing X^0 is deleted by (88).

The empirical picture is one where parts of words cannot be deleted by ellipsis, as *ellipsis* is defined by the theory, i.e., the theory says nothing about other type of deletions. Again, this follows by the definition of VIB. It doesn't follow under the Q -deletion view, since the theory is not about blocking VI, but about deletion of the unique trigger of insertion, the free variable Q . If the empirical picture is correct, and I think it is, then the theory of Q -deletion must ensure this result in some way. An option is just filtering certain illicit structures at PF (e.g., (87)). This is a reasonable way of taking the issue if what is behind the Subword Deletion Corollary is morphological well-formedness.

3.4. Interim Summary

Most mismatches involving the distribution of traces within E-sites follows as a timing issue. The proposed theory makes a division between elliptical objects according to their phrasal or head status. Phrases, including E-sites and phrasal copies, are deleted in the syntax under formal identity and different syntactic conditions, whereas heads are deleted at PF under identity and different morphological conditions. In (90) I repeat the general design emerging from our previous considerations:

(90) Numeration



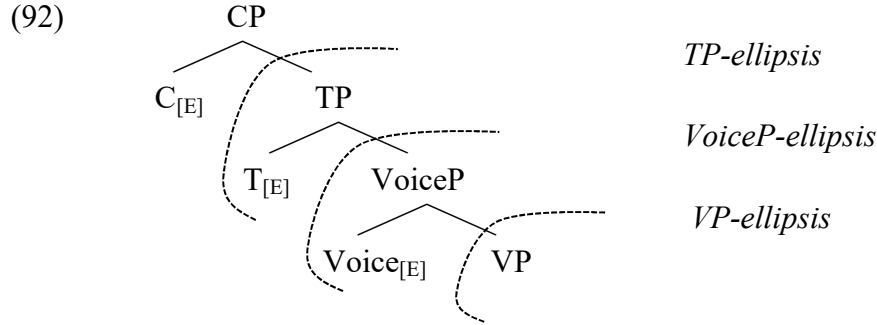
In the next section, I address the problem of inflectional mismatches and show that many of them follow again as a matter of timing.

4. Timing issues #2: Inflectional mismatches and the timing of syntactic ellipsis

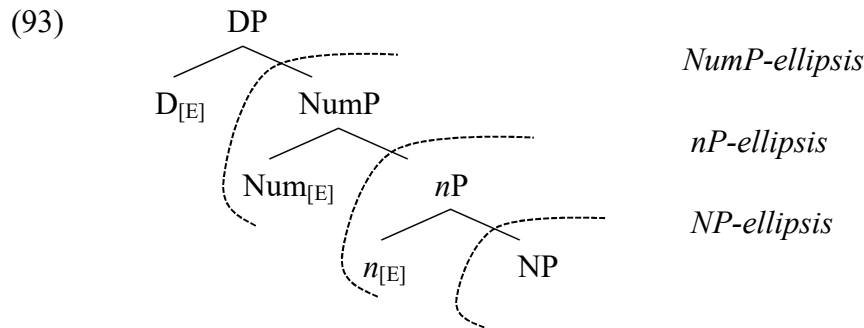
I have claimed that phrasal ellipsis is an operation of narrow syntax. Concretely, ellipsis deletes all *Q*-features for each terminal node contained within an E-site. *Q*-deletion for E-sites occurs in the syntax if certain conditions are met. Such conditions are conditions of licensing and lexical identity. Licensing refers here to the fact that the type of phrases that can be elliptical is constrained by their formal distribution in the clause. This depends to a large extent on language particular properties. For instance, it is a well-known fact that the type of VP-ellipsis that occurs in English is impossible in languages like Spanish. This is evident in cases of auxiliary standing VP-ellipsis (Zagona 1982, 1988, among others):

- (91) a. Bill has read that book and Peter has too.
 b. *Guille ha leído ese libro y Pedro ha también.
 G. has read that book and P. has too

As we have already seen, Merchant (2001) proposes that licensing reduces to the presence of absence of a formal feature, the E(ellipsis)-feature, that determines which phrases are eligible for ellipsis in a given language. This depends on the locus of the E-feature: If C encodes such a feature, we obtain different varieties of TP (including, sluicing, fragment answers and so on); if E is on T, we get VoiceP-ellipsis; and if it is on Voice, VP-ellipsis is licensed:



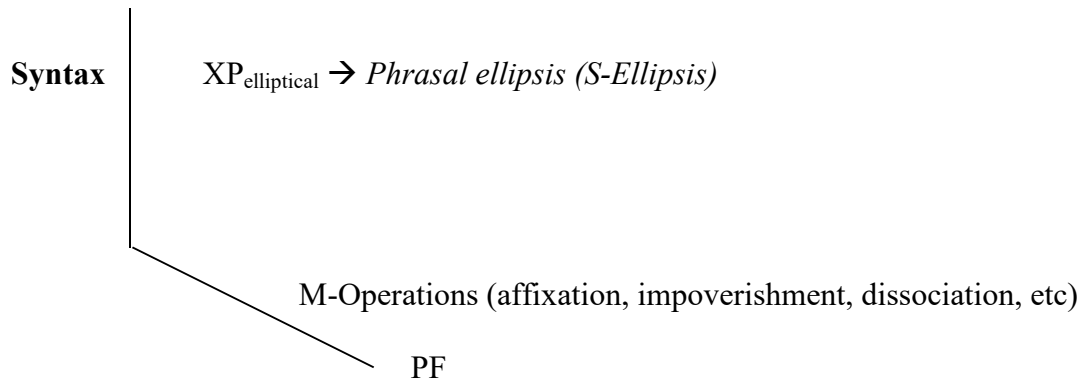
Similar considerations generalize to the nominal domain, where the following types of nominal ellipses are attested (see Saab 2019 for examples of each type and discussion):



The E-feature view provides a typology of elliptical phenomena within and across languages. Moreover, it makes sense of many tolerable mismatches depending on the type of ellipsis involved. In the sentential domain, and depending of the size of the elided phrase, it predicts tense and related mismatches in cases of VP-ellipsis, but not in TP-ellipsis or other higher ellipses. In the nominal domain, it predicts number mismatches for *nP* or *NP*-ellipses but not for *NumP*-ellipsis or other higher ellipses. In broad terms, identity in ellipsis only affects material inside the E-site.

As for the identity condition, our approach does already make certain specific predictions related to the syntax-morphology interaction. Since S-ellipsis applies in the syntax, it follows that identity can only make reference to objects taken from List 1, i.e., bundles of syntactic and semantic features arranged in terminal nodes and Roots. In addition, S-ellipsis is insensitive to the effects of morphological operations. Thus, although they might make opaque a certain identity relation in the syntax, adding or deletion of features at PF cannot alter identity in the syntax.

(94) Numeration



The hypothesis that identity for surface anaphora only makes reference to objects taken from List 1 is not under dispute, I think, although its importance has been neglected in previous literature. Many facts that are not ellipsis mismatches are presented as such as evidence either for a semantic approach to ellipsis or for a relaxed notion of syntactic identity. My impression is that whether or not syntactic identity must be stated in terms of strict or partial matching can only be determined once List 2 effects are put aside. Vocabulary items directly opaque identity relations in syntax. Take a simple case of TP-ellipsis in Spanish involving allomorphy for the tense nodes:

- (95) Juan **fue** al cine y ellos también <**fueron**>.
 J. go.PAST.3SG to the cinema and they also go.PAST.3PL
 ‘Juan went to the cinema and they did too.’

As is well-known, the *pretérito perfecto simple* shows massive allomorphy conditioned by person and number. An incomplete representation of the relevant VIs would be as follows, where the zero exponent competes with the exponent *-ro*:

- (96) List 2: Partial representation of the T node in the *pretérito perfecto simple*:
 [+past, perf] ↔ **-Ø** / ____ [3sg]
 [+past, perf] ↔ **-ro** / ____ [3pl]

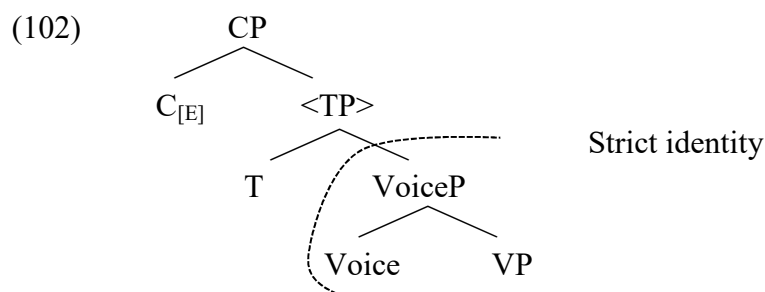
These two items are differentiated both by information regarding exponence and information about the context for insertion. Such a difference is represented at the right of each VI. The information at the left of the each VI tells us that there is perfect identity with respect to the feature bundles they contain. As we already know, these are the feature bundles that are represented in the syntax by abstract morphemes. Tense information, thus, is identical in the syntax. Notice, however, that this is not the only difference between the T nodes in A and the E-site, they also differ in agreement information. We have assumed that agreement nodes are dissociated morphemes. If this is correct, then, the agreement mismatch in (95) illustrates a particular case of opacity induced by morphological operations. In the syntax, then, the T nodes in (95) are strictly identical and *Q*-deletion can apply deleting the relevant *Q*-feature of the T node within the E-site:

- (97) A: T[+past, perf, *Q*] = E-site: T[+past, perf, <*Q*>]

Just to be clear. I am not claiming here that the identity condition must be formulated in strict terms; what I am claiming is that such cases cannot be taken as evidence in favor of more relaxed theories of identity (semantic or syntactic). This reasoning applies to more recalcitrant ellipsis mismatches. Recall Merchant's data involving inflectional mismatches in the high part of the sluiced sentence, which Merchant introduced as one further argument against syntactic identity:

- (98) Decorating for the holidays is easy if you know how!
 a. ≠* ... how [decorating for the holidays]
 b. = ... how [to decorate for the holidays]
- (99) a. I'll fix the car if you tell me how.
 b. ≠* ... how [I'll fix the car]
 c. = ... how [to fix the car]
- (100) a. "I can't play quarterback: I don't even know how."
 [Bart, *The Simpsons*, 'Homer coaches football' episode]
 b. Close the window! Do I have to tell you how?
 c. Eat (something), if you can figure out what!
- (101) I remember meeting him, but I don't remember when. [=I met him]

Similar data lead Rudin (2018) to propose a theory of syntactic identity that makes a crucial division among the features contained within a given E-site. Concretely, he proposes that identity is relevant only for nodes contained within what he calls the *eventive core*, namely VoiceP and categories dominated by Voice:



Rudin's proposal aims to capture tolerable mismatches like those in (98)-(101) and, at the same time, intolerable mismatches regarding the behavior of voice features in sluicing and other high ellipses. Effectively, recall that active-passive alternations are illicit in sluicing (Merchant 2013):

- (103) a. *Joe was murdered, but we don't know who.
 (cf. Joe was murdered, but we don't know who murdered Joe.)
 b. *Someone murdered Joe, but we don't know who by.
 (cf. Someone murdered Joe, but we don't know who Joe was murdered by.)
 [Merchant 2013a: 81]

These (im)possible mismatches seems to follow now under Rudin's proposal. Yet, such a proposal is not the default one; it requires further empirical motivation both internal to English sluicing and other varieties of ellipses within and across languages. Rudin doesn't provide such a

motivation but offers, instead, a type of conceptual argument regarding the functional nature of the eventive core. However, it turns out that for many of the mismatches Rudin discusses there are alternative analyses. As I said, under the *Q*-deletion model system (or the *I*-Assignment one) some of these ellipsis mismatches are indeed expected, the result of two factors: (i) the syntactic licensing of ellipsis, which determines different elliptical sizes (TP-ellipsis vs. *v*P-ellipsis or *n*P-ellipsis vs. NumP-ellipsis), and (ii) the lack of isomorphism between syntax and morphology. The first factor accounts for well-known cases of tense mismatches in English *v*P-ellipsis and the lack of them in TP-ellipsis in several languages, a fact that doesn't follow on Rudin's identity condition (see below). The second factor, much less explored in the literature, is at the heart of most cases of feature mismatches in ellipsis. Again, the general idea is that the conditions that regulate *S-Ellipsis* are entirely calculated in the narrow syntax, before lexical insertion rules and other morphological operations - whose surface effect obscures the form of abstract syntax - apply. Therefore, it could be the case that the antecedents and the elliptical phrases involved in the examples in (98)-(101) have an identical syntax but a different surface realization. In other words, these have to be seen as cases of allomorphy in a general sense. Let me illustrate this point with a case of mood mismatch from Spanish. As shown in detail in Saab (2003, 2008), Spanish stripping can tolerate differences between imperative and subjunctive mood (Buenos Aires Spanish data):⁷

- (104) a. **Ahorrá** plata, no palabras <[_{TP} **ahorres** *t*]>.
 save.IMP money not words **save.SUBJ**
 'Save money, not words.'
- (from an Argentine commercial)
- b. No **ahorres** plata, pero sí palabras <[_{TP} **ahorrá** *t*]>.
 not **save.SUBJ** money but yes words **save.IMP**
 'Don't save money. Save words!'

As is well-known, Spanish, like other Romance languages, has a special form of the imperative mood in affirmative sentences, but only for the morphological second person (see Harris 1998 for extensive discussion). Thus when the pronoun involved is *usted* 'you', which conjugates as a third person - even when it refers to the hearer -, the verbal form occurs always in the subjunctive, regardless of the polarity of the sentence (e.g., *venga* 'come' vs. *no venga* 'don't come'). On the basis of this particular behavior of the imperative mood, Harris (1998) has convincingly argued in favor of a purely morphological analysis for the imperative. Concretely, he proposes that the form of the imperative is the result of an impoverishment rule that deletes the subjunctive feature on the verb under the presence of a morphological second person:

- (105) [+subjunctive] → Ø / ____ [2pers]]_C
- (Harris 1998: 40)

This rule only applies under a structural condition that requires that the feature affected by deletion is located on C, which is precisely what happens in affirmative imperatives. In effect, clitic position in affirmative imperative sentences (i.e., V-CL ordering, *hacé-lo* 'do it' vs. *no lo-hagas* 'don't do it'), among other facts (see Laka 1990), shows that there is V-to-C movement in

⁷ I am assuming that stripping is TP-ellipsis with movement of the remnant out of the elliptical site (see Depiante 2000 for an analysis of Spanish stripping).

such environments. As discussed at length in Saab (2008), Harris' morphological analysis plus a strict identity condition on ellipsis applying in the narrow syntax leads to the conclusion that the tolerable mismatches in (104) are illusions: as far as syntax is concerned the verbal form in the antecedent and the elided verb is strictly identical. As shown in (106), identity under ellipsis is trivially satisfied in this case; i.e., the elliptical TP is correctly *[I]*-assigned in the syntax (cf. 104a):

- (106) Ahorrá plata, pero no palabras <[TP^I **ahorre** *t*]>.
save.SUBJ money but not words **save.SUBJ**
 'Save money, but not words.'

Even though in most cases there are clear basis to decide if a given legitimate mismatch should be derived as matter of elliptical size or as a syntax-morphology mismatch, there are however situations where both possibilities might overlap. Indeed, the case in (98b) seems to be, in principle, amenable to both solutions. Tanaka (2011), for instance, has proposed that the alternation between nonfinite *-ing* forms and *to* infinitives in cases like (98b) are explained by the fact that sluicing here deletes a VP and not a TP and, in consequence, the tense node is simply not evaluated for the purposes of the identity condition on ellipsis.⁸ A similar analysis has been suggested by Saab (2003) for cases in which a finite form in Spanish can be a suitable antecedent for a nonfinite form or vice versa:

- (107) Recuerdo [FinP [TP haber arreglado el auto]], pero no
 remember.1SG have.INF fixed the car but not
 recuerdo [FinP cuándo <[TP **arreglé el auto**]>]
 remember.1SG when fixed.1SG the car
 'I remember having fixed the car, but I do not remember when.'
 (108) [FinP Juan finalmente [TP arregló el auto]] aunque
 J. finally fixed the car although
 parecía no saber [FinP cómo <[TP **arreglarlo**]>]
 seemed not know.INF how fix.INF-it
 'John finally fixed the car, although he seemed not to know how.'

In cases like these, we can assume that the syntactic difference between A and E is in the finiteness property that, under reasonable assumptions, is not a property of the tense node by itself but of another higher functional category (labeled FinP in Rizzi 1997, for instance). If this is on track, the tolerable mismatches in (107) and (108) are derived from the licensing of ellipsis, in the sense that the feature triggering the difference is not part of the elided phrase and, consequently, not computed for identity. The fact that finite and nonfinite forms are also distinguished by the analytical-synthetic distinction is a surface effect that arises because of the way in which PF realizes the abstract syntactic nodes. Both the English mismatches in (108), on

⁸ Tanaka's system should explain why a non-elliptical version of (98b) is ruled out:

(i) *Decorating for holidays is easy if you know how [_{VP} decorate for the holidays].

Tanaka acknowledges the problem and proposes that the exponent of the T head (i.e., *to*) is deleted at PF whenever its VP complement is elliptical. This stipulation would be justified by the exceptional behavior of non-finite sluicing with remnant *how*.

the one hand, and the Spanish ones in (107) and (108), on the other, are amenable to an analysis under which this kind of grammatical mismatches follows from the syntax-morphology connection, as well. For instance, it is perfectly conceivable an analysis for Spanish in which the non-finite form arises, not as the result of a syntactically relevant feature, but as the PF reflex of particular syntactic configuration. Abstractly, this should be thought as a case of allomorphy conditioned by syntax.

However, this is not the whole story. Rudin also provides the following relevant examples involving mismatches in tense, modality, polarity and illocutionary force (Rudin 2018: 13-14 and references therein):

- (109) Your favorite plant is alive, but you can never be sure for how long <your favorite plant will be alive>.
- (110) a. Sally knows that there is always the potential for awful things to happen, but she doesn't know when <awful things {will, might} happen>.
b. Although Sally sees that she must defeat her competitors, she relies on Susie to tell her how <to defeat her competitors>.
c. Sally said that customers should be given lower rates, but Susie said it's hard to see how <customers could be given lower rates>.
- (111) Either turn in your final paper by midnight or explain why <you didn't turn it in by midnight>.
- (112) Always save a little from each paycheck. Once you're older, you'll understand why <you should always save a little from each paycheck>.

Consider, for instance, the tense mismatch in (109). It would follow under the present theory either if (i) tense is outside the E-site or (ii) tense features are dissociated. The latter option is, of course, untenable. The former could be implemented if tense features are inherently on C and passes to T through an inheritance mechanism (Chomsky 2007, 2008). This would imply a formulation of identity able to distinguish between inherent and non-inherent features (maybe along the lines of Chomsky 1965 with obvious adaptations). This, however, would be a hasty move by virtue of the fact that tense mismatch under ellipsis is an understudied phenomenon. Many facts coming from Spanish TP-ellipsis shows that in the normal case tense mismatch is not tolerable, against the expectations of Rudin's theory (see Brucart 1987, Murguía 2004, Saab 2008 and Saab & Vicente 2015 for some important qualifications). Consider an intolerable tense mismatch in a simple case of TP-ellipsis:

- (113) *En el pasado, María ha leído mucho y
in the past María has read a-lot and
Elena en el futuro <habrá leído mucho> también.
Elena in the future will-have read a-lot also
'María has read a lot in the past and Elena in the future will have too.'

[adapted from Murguía 2004: 86]

An inheritance approach to (109) would be in obvious conflict with the basic fact in (113), unless one assumes that identity works differently for different varieties of TP-ellipsis, not a desirable conclusion. In a recent reply to Rudin, Ranero Echeverría (2019) argues that, unlike to what

happens in (113), Rudin’s paradigm involves cases where there is no feature clash between the conflicting heads. In a sluice like (109), the tense node in A is present but the corresponding T node in the E-site is tenseless. The sluice also contains a modal which is absent in the antecedent. Ranero Echeverría contends that this is indeed part of a larger generalization: ellipsis mismatches are allowed whenever the matching features are non-distinct. Here is a simplified version of Ranero Echeverría’s identity condition:

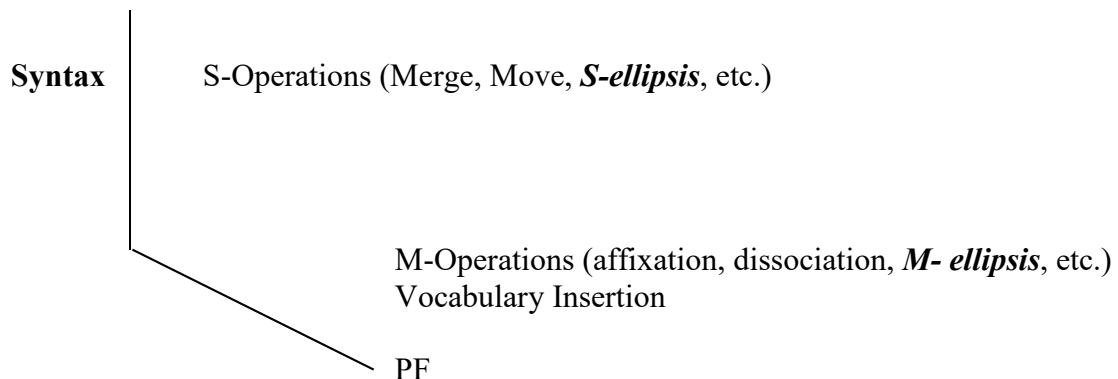
(114) Antecedent and ellipsis site must be featurally non-distinct.

Two terminal nodes are non-distinct if a given feature is present in one node but absent in the other; i.e., the feature is privative. Absence vs. presence of a node also satisfies (114), according to Ranero Echeverría. So, in (109) the T node in A is [present] but it is zero in the E-site. In addition, the E-site contains a modal which is absent in A. Both mismatches meet the condition in (114). The same reasoning extends to other examples provided by Rudin. As for (113) and several other intolerable tense mismatches in TP-ellipsis, it has to be the case that the tense nodes are featurally distinct. This account implies a theory of feature representation that I cannot evaluate here, but as far as I can tell, Ranero Echeverría’s approach is more promising than Rudin’s and can be empirically evaluated with large consequences. The hope is that once matters of licensing and ellipsis timing are factored out, we will be able to be close to a proper definition of syntactic identity.

5. Null arguments and the timing of ellipsis: Beyond traditional surface anaphora

I have proposed a theory of grammatical deletion that makes a crucial division between syntactic and morphological ellipsis. Both types of ellipsis apply before vocabulary insertion and are differentiated by the component of the grammar in which they occur: narrow syntax or morphology. Here is the final picture emerging from the *Q*-deletion theory.

(115) Numeration



In this section, I turn to my attention to the different behavior of null subjects in Japanese and Spanish and show how the proposed division between phrasal and head ellipsis captures the basic facts providing additional support for the particular design of ellipsis operations proposed here.

5.1. Oku's observation and the nature of null arguments

Oku (1998) first observed that Spanish and Japanese differ in nontrivial ways as far as the interpretative properties of null subjects are concerned. Thus, while the null subject in the Japanese example in (116) is ambiguous between a strict and a sloppy reading, according to which either John thinks that Mary's proposal will be accepted or his(=John) own proposal will, the null subject in (117) only admits the strict reading, according to which the empty subject can only refer to María's proposal and not to John's:

- Japanese: strict reading OK, sloppy reading OK
- (116) a. Mary-wa [zibun-no teian-ga saiyo-sare-ru-to] omotteiru.
 Mary-TOP [self-GEN proposal-NOM accept-PASS-PRES-COMP] think
 'Mary₁ thinks that her₁ proposal will be accepted.'
- b. John-mo [e saiyo-sare-ru-to] omotteiru.
 John-also [e accept-PASS-PRES-COMP] think
 Lit. 'John also think *e* will be accepted.'

- Spanish: strict reading OK, sloppy reading *
- (117) a. María cree que su propuesta será aceptada.
 Maria believes that her proposal be.FUT accepted
 'Maria believes that her proposal will be accepted.'
- b. Juan también cree que *e* será aceptada.
 Juan also believes that it be.FUT accepted
 'Juan also believes that it will be accepted.'

[Oku 1998: 165]

With the exception of the recent work by Duguine (see Duguine 2013 and below for more discussion), most researchers draw a fundamental division between Japanese and consistent null subject languages of the Spanish type (see among others, Saito 2007, Şener & Takahashi 2010, Takahashi 2008a,b, 2010, 2013). Concretely, it is claimed that given that argument ellipsis is not attested in Spanish, it should be the case that this language and consistent *pro*-drop languages in general, are not amenable to an ellipsis analysis but only to a *pro* one. Put more generally, it seems that the division between Japanese and Spanish can be derived under the well-known distinction between surface and deep anaphora (Hankamer & Sag 1976): whereas Japanese null subjects are instances of surface anaphora (i.e., ellipsis), Spanish makes use of deep anaphora in subject position (i.e., *pro*):

- (118) a. Japanese: [IP ... ~~DP~~_{Subject} ...]
 b. Spanish: [IP ... *pro*_{Subject} ...]

However, under closer inspection, it turns out that the basic facts are directly accounted for under the *Q*-deletion system with some beneficial consequences. Concretely, while Japanese argument drop is a case of S-ellipsis, Spanish null subjects are derived by M-ellipsis at PF. As proposed in Saab (2008, 2016) null subjects of the Spanish type instantiate a case of head ellipsis under adjacency. Recall that, as discussed in section 3, head ellipsis can be fed by M-operations. Suppose then that null subjects are pronominal DPs that move to Spec,TP in the syntax. At PF, a dissociated morpheme is added to the T node on the basis of the inflectional information encoded

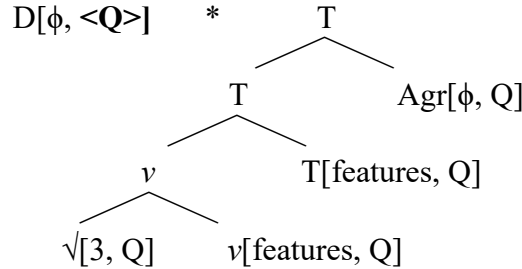
on the subject DP. Once linearization takes place, the conditions for Q -deletion at PF are met and the pronominal subject is consequently deleted:

(119) Head Ellipsis (under Q -deletion):

Given a morphosyntactic word MW, delete every Q -feature contained in MW if and only if:

- (i) There is an identical antecedent contained in a morphosyntactic word MW',
- (ii) MW is adjacent or immediately local to MW'

(120) Spanish null subjects as M-ellipsis:



This analysis for consistent null subject languages automatically accounts for the fact that Spanish does not allow sloppy readings in examples like (117). The only syntactic object that morphological agreement allows “eliding” is the ϕ -set on the D of which agreement itself is a mere copy. But notice now that a ϕ -set can only be a pronoun and nothing else. Thus, absence of sloppy readings in sentences like (117) follows without any further ado.

This view on null arguments contrasts with Duguine’s (2013) uniform analysis, according to which null subjects in Japanese and Spanish are uniformly derived as cases of phrasal ellipsis. It is important then to show that the division proposed in this section holds. In the next subsection, I discuss Duguine’s approach and show that it cannot be sustained empirically.

5.2. A criticism to Duguine’s uniform analysis

According to Duguine, the fact that we find cases of phrasal subject ellipsis like (116b) goes directly against my head ellipsis approach to null subject phenomena. Instead, she proposes a general and unified phrasal ellipsis account under which all cases of null subjects across languages are cases of phrasal ellipsis. First, it is important to note that the Q -deletion system is fully compatible with both the existence of syntactic (i.e., phrasal) and morphological (i.e., head) ellipses; indeed, as I have tried to show in Saab (2008) and in this paper several paradoxical facts are directly explained if we accept this division in the first place. So Q -Deletion of heads by morphological agreement is just one of the options my system legitimately allows.

Second, crucial to Duguine’s analysis, of course, is the very nature of Oku’s observation, because, if correct, her unified account would not be able to derive the attested patterns across languages. In other words, if all null subjects are elliptical DPs, then the absence of sloppy readings in Spanish for cases like (117) are not correctly ruled out in her system. This is the reason, I think, that leads Duguine to directly attack Oku’s generalization. In effect, according to her this is a spurious observation. The point, she argues, is that adding an objective pronoun in

the embedded clause in (117b) co-referential with the main subject makes the sloppy reading available (Duguine 2013: 442).

- (121) A: María cree que [su propuesta **le** será
 Maria believes that POSS proposal CL.3SG(DAT) be.FUT
 aceptada (a ella)].
 accepted to her

Lit. ‘Maria believes that her proposal will be accepted to her.’

- B: Juan también cree que [[e] **le** será
 Juan also believes that CL.3SG(DAT) be.FUT
 aceptada (a él)].
 accepted to him

Lit. ‘Juan also believes that [e] will be accepted to him.’

Sloppy reading OK

In view of this fact, she proposes a new generalization on sloppy readings for null subjects in Spanish:

(122) **Generalization on the sloppy reading in Spanish:**

Possessive pronouns embedded within elided DPs fail to give rise to a sloppy reading when they do not have a local antecedent. (Duguine 2013: 441)

This is a curious observation that does not seem to follow from any obvious constraint on sloppy readings in, for instance, well-known ellipsis contexts. Indeed, as Duguine acknowledges, the sloppy reading in (117b) automatically reappears whenever the embedded clause is part of an elliptical TP (see Duguine 2013: 444, footnote 33). But this fact is derived under the (rough) analysis in (123b) below, where *su propuesta*, which can be co-referential with the matrix subject, is not a null subject, but a full DP contained within the elliptical TP.

- (123) a. María cree que su propuesta será aceptada.
 Maria believes that her proposal be.FUT accepted
 ‘Maria believes that her proposal will be accepted.’
 b. Juan_i también <[cree que **su_i** **propuesta/e** será
 Juan also believes that his proposal be.FUT
 aceptada]>.
 accepted
 ‘Juan also believes that it will be accepted.’

Therefore, (123b) has nothing intriguing; it is just a typical case of sloppy reading under ellipsis. It would be puzzling only if we accepted that Spanish null subjects are elliptical phrases, as Duguine proposes. Under my proposal for instance (but the same under a *pro* analysis) there is nothing special here. At any rate, what seems to be spurious is not Oku’s observation but the generalization in (122). Let’s see why. First, for my informants, but apparently not for Duguine’s, it is important to have some contrast between the object DPs in parentheses. Without this contrast, the sloppy reading is clearly disfavored and, even thus, speakers’ reactions are quite unstable. Duguine’s informants, instead, prefer a null DP object, at least in very similar examples

(see Duguine 2013: 439, footnote 23). In any case, the judgments are not consistent among speakers. Second, and even more importantly, speakers' judgments are entirely consistent in cases like the following ones, which do not allow for sloppy readings even when they observe the condition in (122):

- (124) A: Juan_j cree que su_j novia_i lo_j ama
 J. believes that his girlfriend CL.ACC.MASC.SG loves
 (a él_j).
 ACC him

'Juan_j believes that his_j girlfriend_i loves him.'

- B: Pedro_k también cree que [e]_i lo_{k/j} ama (a él_{k/j}).
 P. also believes that [e] CL.ACC.MASC.SG loves (to him)
 'Pedro also believes that she_i loves him.'

- (125) A: Juan_j dice que su_j madre lo_j criticó (a él_j).
 J. says that his mother CL.ACC.MASC.SG criticized (to him)
 'Juan_i says that his_j mother_i criticized him_j.'

- B: María_i también dice que [e]_i la_i criticó (a ella_i).
 M. also says that CL.ACC.FEM.SG criticized (to her)
 'María also says that she_i criticized her.'

- (126) a. A Juan_i le_i pegó su_i madre_j.
 to J. CL.DAT.3SG hit his mother
 'His_i mother hit John_i.'

- b. Pedro_k espera que [e]_i no le_k pegue a él_k.
 P. hopes that not CL.DAT.3SG hits to him
 'Pedro hopes she_i does not hit him.'

- (127) A: Juan cree que su madre_i le regaló un libro.
 J. believes that his mother CL.DAT.3SG gave a book
 'Juan believes that his mother gave him a book.'

- B: Pedro también cree que [e]_i le regaló un libro.
 P. also believes that CL.DAT.3SG gave a book
 'Pedro also believes that she_i gave him a book.'

(124-127: [e]= strict reading)

So far, it seems that Duguine's observation does not hold. However, there is still a set of data (those that pattern like the example in (121B)) that produces particular reactions in the speakers. But this, of course, does not lead us to generalize the worst case scenario, since it is well known that sloppy readings are also attested for deep anaphora (i.e., pronouns) under some particular conditions (see Merchant 2013b and the references therein). In effect, my own impression is that data like (121B) and similar ones suppose some type of pragmatic accommodation. The fact that some speakers react allowing a sloppy reading is due to the fact that the strict reading for those particular examples is at odds with our common sense that someone will accept John's proposal to Peter, although the relevant context can be constructed. Recall that my informants prefer contrasting embedded objects, showing that we are talking about different alternatives for the

variable in “x’s proposals”. For those speakers that accept the sloppy reading when the embedded indirect objects are null, it seems that they have constructed a previous background according to which we were talking about different proposals (John’s, Peter’s and so on) to be accepted.

More robust data against Duguine’s uniform analysis come from the additional observation that, while null subjects in Japanese can be ambiguous between a quantificational and an E-type reading (see Takahashi 2008a,b and 2010), Spanish does not, as shown in (129):

- (128) a. Sannin-no mahootukai-ga Taroo-ni ai-ni kita.
 three-GEN wizard-NOM Taroo-DAT see-to came
 ‘Three wizards came to see Taroo.’
 b. [e] Hanako-ni-mo ai-ni kita.
 Hanako-DAT-also see-to came
 ‘lit. *e* came to see Hanako, too.’

[*e*] = the set of wizards are coincident (E-type reading).

[*e*] = the set of wizards can be divergent (quantificational reading)

- (129) a. Tres magos vinieron a ver a Juan.
 three wizards came to see ACC J.
 b. [e] Vinieron a ver a Pedro también.
 came to see ACC P. also
 (only E-type reading)

Thus, null subjects in Spanish behave (again) as English weak pronouns:

- (130) a. Three wizards came to see Taroo.
 b. **They** came to see Hanako, too. (only E-type reading)

The quantificational readings, as argued by Takahashi at length, are directly derived under the DP ellipsis analysis:

- (131) <Sannin-no mahootukai-ga> Hanako-ni-mo ai-ni kita.
 three-GEN wizard-NOM Hanako-DAT-also see-to came

Therefore, Duguine’s uniform analysis overgenerates quantificational readings in contexts where they are clearly impossible.

A final piece of evidence in favor of the distinction between phrasal DP ellipsis and head ellipsis (or pronoun ellipsis) comes from another consistent *pro*-drop language like Hungarian. Notice first that in examples like (132) only the strict reading is possible:⁹

- (132) A: Mari azt hiszi, hogy eltört a lába.
 Mari that.ACC believes that broke the foot.POSS3SG
 ‘Mari believes her foot is broken.’

⁹ Thanks to Anikó Lipták for examples and discussion on Hungarian.

B: Péter is azt hiszi, hogy eltört.
 Peter also that.ACC believes that broke
 ‘Péter also believes her foot/*his foot is broken.’ (only strict reading)

As for Takahashi’s observation, notice now that only the E-reading is grammatical:

(133) A: Három varázsló meglátogatta Jánost.
 three wizard visited.3SG János.ACC
 ‘Three wizards visited János.’
 B: Meglátogatták Pétert is.
 visited.PL Péter.ACC too
 ‘They visited Péter, too.’

As Anikó Lipták (p.c.) points out the conjugation on the verb in (133B) has to be plural. In (133a) it is singular, because the noun ‘wizard’ is singular (after numerals, Hungarian requires singular nouns). In (133B), however, you cannot have singular agreement, because the reference is plural:

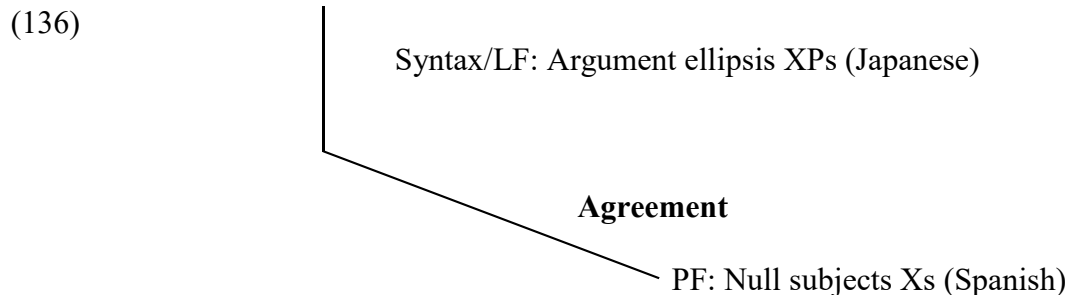
(134) * Meglátogatta Pétert is.
 visited.SG Péter.ACC too
 ‘He visited Péter, too.’

This pattern is compatible with the *pro* or the head ellipsis analysis for consistent NS languages, but not with Duguine’s uniform analysis in terms of DP-ellipsis. Concretely, under a DP-ellipsis analysis, (iii) should be grammatical with a singular verb because the elliptical subject is singular:

(135) * < **Három** **varázsló**> meglátogatta Pétert is.
 three wizard visited.SG Péter.ACC too

I conclude then that a uniform analysis is not sustained by empirical evidence and that Oku’s observation holds together with other empirical differences between radical and consistent *pro*-drop languages discussed above.

In summary, the different distribution of null subjects in Japanese and Spanish conform to the typology of ellipsis proposed in this paper, according to which phrases and heads are deleted in the syntax and morphology, respectively.



6. Conclusion

I have shown that many ellipsis puzzling facts can be captured under a theory with the following crucial ingredients:

- (A) Ellipsis is a grammatical operation that applies at different stages of a given derivation deleting *Q*-variables on terminal nodes before Vocabulary Insertion applies.
- (B) The type of objects that can be elliptical are phrases or heads. Phrases are deleted in the syntax, whereas heads are deleted at PF.
- (C) Traces, E-sites and certain types of null arguments form a natural class of phenomena.

Among other facts discussed previously in this paper, the theory explains the particular behavior of phrasal vs. head copies within E-sites, many inflectional mismatches in surface anaphora and the distribution of null arguments in radical *pro*-drop languages of the Japanese type and in consistent null subject languages of the Spanish type. The final picture is an integral theory of ellipsis with large empirical coverage. I conclude contending that competing theories of ellipsis should be evaluated with respect to their descriptive power regarding the same set of apparently unrelated phenomena

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