Ellipsis in a modular perspective*

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1 Introduction

Johnson (2008:1): "Ellipsis is the consummate crowd-pleaser."

- What makes it crowd-pleasing is the breadth of its empirical (and thus theoretical) footprint:
  - Implications across roughly all areas of grammatical description.
- But it is precisely this expansiveness that makes it such a tough nut to crack.
  - If the architecture of grammar is *Modular*, as nearly all of us(?) believe,
    - What theory of ellipsis could coordinate effects across all the different modules, while simultaneously respecting the boundaries that separate those modules?

I won't attempt to answer a question of such broad scope here;

- Instead, I'll focus on just one proper subpart of this problem:
  - **How normal syntactic structures wind up silent** (presupposing structure within ellipsis sites throughout).
  - (I completely set aside questions of ellipsis identity/recovery, focusing entirely on the Syntax-PF relation.)

Surprisingly little progress has been made on this question, though one catchphrase is ubiquitous:

- "Ellipsis is deletion at PF."

To evaluate this statement, I assume a **Strictly Modular design** of the interface between syntax and phonology.

- Viewed from this perspective, various possible formalizations of "deletion at PF" fare quite poorly.
- Taking for granted that we don't wish to abandon Strict Modularity, then we must pursue alternatives.

Goals:

- Use the constraints imposed by Strict Modularity to adjudicate among different **theories of elliptical silence**.
  - Conclusion: all existing approaches fail. Both phonological deletion and non-insertion violate *Domain Specificity* (see below).
- Sketch a Modularity-respecting alternative: **elliptical silence as null exponence**.
  - That is: insertion of silence (rather than non-insertion).
- Explore some consequences of this approach, including:
  - The dissociation between [E]-licensing (in the syntax) and null exponence (at Vocabulary Insertion).

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2 Starting assumptions

I adopt the following initial assumptions without further justification:

(1) a. Derivation by phase and the PIC (Chomsky 2001, et seq.)
b. Late Insertion of Vocabulary Items, a.k.a. Vocabulary Insertion (*VI*: Halle 1990, Halle and Marantz 1993, et seq.)
c. Strict Modularity (inc. a *feed-forward Y-model* of grammatical architecture: Chomsky 1965)

The last item is rarely discussed explicitly in interface work (from a syntactic angle).

- I lay out a few consequences of this premise below, and then use them as a metric for evaluating theories of ellipsis.

Module: A domain-specific cognitive system dedicated to carrying out a single narrowly-construed computation.

- They take input (formulated in an alphabet proprietary to that module);
- Perform their computation automatically;
- Output the result (requiring translation if it is to be used as input for another module).

(2) **Some definitional properties of modules** (Chomsky 1965, Fodor 1983, Segal 1996, Jackendoff 1997, Scheer 2012:§36)
a. ***Domain Specificity***: each module has its own proprietary vocabulary; one module cannot understand the vocabulary of another module.
b. ***Encapsulation***: the computation within a module is bounded by its own input, which is fixed for each iteration; it is blind to the activity and information of other modules (and the central system, i.e. general cognition)

(3) **Domain Specificity in a linguistic context**
a. Proprietary vocabularies (alphabets, symbolic systems, etc.):
(i) Syntax: formal features, categories, phrases…
(ii) Phonology: distinctive features, segments, x-slots…
b. How to violate: a computation which has **simultaneous access to more than one vocabulary** (e.g. accessing both syntactic and phonological information within the same module).

(4) **Encapsulation in a linguistic context**
a. Input-boundedness (no external additions mid-computation)
(i) Syntax: the Numeration / Lexical Array (from List 1), workspaces…
(ii) Phonology: linearized segmental and skeletal information (from List 2)…
b. How to violate: a computation which is able to access new information not originally present in its input (i.e. an *Inclusiveness* violation in MP terms).

I also employ a standard Minimalist heuristic ("methodological Minimalism"):

(5) **The Minimalist critique** (or, rather, its consequence):
If we don't need it, we can't have it

- This will have bite when it comes to evaluating inter-modular redundancy.

See Newell and Sailor (submitted) for more on these assumptions and their consequences for the syntax-phonology interface.

I also adopt certain standard assumptions about ellipsis, below.

3 Holding theories of elliptical silence to a Strictly Modular standard

3.1 Ellipsis isn't "deletion at PF"

The state of the art for 20+ years, following the work of Merchant (2001, i.a.):

- Since ellipsis licensing is syntactic, there must be an E(llipsis)-feature borne by all and only the licensing heads.
  - [E] is satisfied under Agree (potentially at a distance: Aelbrecht 2010), but that's all that syntax does.
  - What constrains the distribution of [E] – i.e., why only some heads bear it and not others – is still poorly understood.

- The remaining effects of ellipsis arise entirely at the interfaces, following "instructions" encoded on [E].
  - LF is instructed to impose some form of identity (e.g. mutual entailment modulo focus-closure);
  - PF is instructed to generate the silence that characterizes ellipsis…somehow.
    - The latter is why ellipsis is commonly referred to as simply "deletion at PF".

What does "deletion at PF" actually mean? Surprisingly few attempts to be explicit.

- To his credit, Merchant does offer some initial suggestions (emphasis mine), despite it being orthogonal to his interests:[1]
  - Merchant (2001:60): "the [E] feature will indicate [that] its sister is not to be prosodically incorporated into the PF structure at all."
  - Merchant (2004:671): "…a familiar kind of **morphologically triggered syncope**: here the morphological trigger is [E] and the syncopated element is TP. This is the entirety of 'PF-deletion' […] The non-pronunciation is entirely controlled by the actual phonology (that component which takes a PF structure as its input), in ways familiar from studies of morphologically determined syncope phenomena, **here merely applied to a larger prosodic unit**."
    - "…(how this should be implemented in current models of phonology is not germane to my interests here)."
      - Point of order: it can't be implemented.
      - Scheer (2011:616): "No phonological theory is suited for the manipulation of this kind of object, which phonologists look at like an ant looks at a jumbo jet."
  - Merchant (2008:134): "…we can view [E] to be **something like a suprasegmental**, but with the unusual effect of parsing its complement IP into a prosodically unrealized category. […] PF-'deletion', in this view, is the result of **a feature in the syntax**"
- But the Modularity problems are plain:
  - Even putting aside well-placed criticisms of [E] as being mostly descriptive, it poses a serious Modularity problem if formulated this way.
  - Domain Specificity cannot allow "a feature in the syntax" "to be something like a suprasegmental".

Even overlooking the details, it seems any PF-deletion approach will fail. A more general problem looms:

- If we take "deletion" to mean "removal of phonological material",[2] then the "at PF" bit has to mean "in the phonology":
  - Manipulation of the phonological vocabulary can only happen within that module (Domain Specificity).
- One idea that won't work: the phonology deletes a phrase corresponding to the ellipsis site.
  - Problem: phonology doesn't work with phrases (see Scheer quote above).
  - You're thinking, "well prosodic phonology does!"
  - But actually, if we take Minimalist assumptions seriously, then it doesn't, and it can't. In brief:
    - Direct Reference approaches are strong Modularity violators (no Domain Specificity)
    - Indirect Reference approaches respect Modularity in principle, but often not in practice (cf. OT implementations)

[1] Other works make crucial use of actual phonological deletion (An 2019, Erschler 2022, a.o.), so while the details of such a mechanism weren't relevant for Merchant, they have become relevant for the field.

[2] We could of course take "deletion" to mean "removal of structure (which then can't be pronounced)"; this is the tack taken in Murphy and Müller (2022), for instance, resuscitating some of the earliest generative ideas about ellipsis. I will not pursue structure removal further here, despite that it has the virtue of posing no apparent challenges to a Modular theory of the interface.

        - And they duplicate the work of syntax, violating (5).[3]
    - See Pak (2008), Samuels (2009, 2011), Scheer (2011:§706), and Newell and Sailor (submitted).
- Another idea that won't work: the phonology deletes the individual words that collectively make up the ellipsis site.
    - But where do its marching orders come from?
        - If ellipsis is effected in the syntax (see below), then there's another Domain Specificity problem lurking:
        - The syntax would then be in the business of marking terminals with "delete me" diacritics only legible within the phonology.[4]
        - Diacritics violate Domain Specificity by definition, since their job is to smuggle bits of one module's vocabulary into another (Scheer 2012:§95).

So "deletion at PF" is a non-starter when viewed through the lens of Strict Modularity:

- Phonology would either have to operate on a too-large structure,
- Or it would need diacritic instructions passed to it from a module that has no business dealing with such information.

But just in case these purely theoretical arguments don't convince you, there are good empirical arguments:

- Ellipsis can also disrupt allomorphy (see Appendix C).
    - This places the timing of elliptical silence as derivationally prior to phonology (assuming Late Insertion).
- Ellipsis can salvage cases of morphological ineffability (Merchant 2015, Abels 2019, Mendes and Nevins, to appear).
    - For the same reasons, it's hard to imagine how phonological deletion could achieve this. (See below for non-insertion accounts.)

Approaches to elliptical silence couched in Vocabulary (non-)Insertion come closer...

- ...but also fail for Modularity reasons, as we'll now see.

3.2 Non-insertion approaches to elliptical silence all violate Modularity too

The main competitor to "deletion at PF" as a theory of elliptical silence: **non-insertion** (Wilder 1997, Bartos 2000, 2001, Kornfeld and Saab 2004, Saab 2008, Saab 2022, a.o.)

- Elliptical silence is the result of Vocabulary Insertion failing to apply to ellipsis-internal terminals.[5]

Even though it's been around as long as 'deletion at PF' (in those terms, but cf. Ross 1969, Sag 1976), it remains a minority view (although one that's gaining increasing popularity)

- But how does it actually work?

One option: licensing marks ellipsis-internal terminals with **"don't insert on me" features** (Saab 2008, Merchant 2015).

- When Vocabulary Insertion (VI) encounters such a feature, it simply doesn't add List 2 material to that terminal.
- Problem: Modularity is violated in at least one way.

[3] An even weaker version of prosodic phonology reduces the inventory of "prosodic constituents" to the inventory of Spell-Out domains (Kratzer and Selkirk 2007, a.o.), making prosodic constituency superfluous: again see (5). This reduction seems to pose problems for prosodic phonology (see Scheer 2012:§122), but see below for discussion of ellipsis.

[4] One way around this is to claim that "deletion applies for free", and then leave the job of filtering out ill-formed ellipses to some other part of grammar. This is the approach taken in Ott and Struckmeier (2018), who imply that over-application of freely-applying ellipsis will lead to unrecoverable deletions, which they imply are ruled out on grounds of discourse infelicity (i.e., the grammar generates such over-applications, but we don't use them because it wouldn't be Gricean of us). Aside from the fact that this kind of approach seems to ignore all the findings attributed to ellipsis licensing since Bresnan (1976), it also predicts no interactions between ellipsis and other syntactic processes, contrary to fact (Aelbrecht 2010, Sailor 2018, etc.).

[5] See Appendix A for remarks about cyclicity with respect to VI-based accounts of elliptical silence.

- As noted in Saab (2022), the addition of arbitrarily-many "don't insert on me" features mid-computation is a clear Inclusiveness violation.
  - (Inclusiveness is the MP name for Encapsulation: Scheer 2011:§648.)
- Moreover, Domain Specificity is also violated, as we'll now see.

An alternative: Saab (2022)

- We can overcome the Encapsulation problem by adopting a very early proposal about VI (Halle 1990):
  - VI isn't *additive* (as above), but rather *replacive*:
    - It doesn't a add List 2 item to a terminal; rather, it replaces a placeholder variable, [Q], on that terminal.
    - (See Halle 1990 and Embick 2015:§4.2 for further details on this distinction.)
  - With this assumption, Saab's solution is to take ellipsis to be **removal/deletion of this [Q] variable** within the syntax.
    - Thus, terminals inside an ellipsis site simply fail to provide an input for a replacive VI operation.
    - Encapsulation is respected: nothing new is added mid-computation.
      - (This of course requires [Q] to be present in the input to the syntactic module, suggesting it is an intrinsic part of every List 1 entry; see Embick 2015:§4.2 for some relevant discussion.)
- This solves our Inclusiveness/Encapsulation problem…
  - However, **a different Modularity problem is lurking**, as we'll now see.

Within a Modular architecture, where exactly is Vocabulary Insertion?[6]

- It can't be a syntactic operation (even a 'late' one):
  - While it takes syntactic features as its input, it produces phonological features as its output.
  - Locating VI within the syntax would make it a syntactic operation that manipulates items of the phonological alphabet, contrary to everything else we know (see e.g. Zwicky and Pullum 1986).
  - (NB: it can't be a phonological operation for the same reason)
- I'll follow Scheer (2012:§169) in taking VI to be intermodular:
  - It is responsible for translating the output of the syntax module into terms the phonological module can take as its input.
  - (This is what allows it to read and write two different alphabets: it isn't a module, so it isn't subject to Domain Specificity.)

The question now arises: what is [Q]?

- It isn't a syntactic feature: it has no bearing whatsoever on the syntactic computation.
- By design, it's an instruction meant solely for VI: it tells VI when and how to do its job.
  - Ergo, it isn't an item of the syntactic alphabet; it's some other formal device.
  - Ergo, by Domain Specificity, the syntax can't delete it, or otherwise "see" it at all.
    - So even if VI is replacive rather than additive, and we pack [Q] into all our List 1 entries…
    - …our syntax can't delete it in order to effect elliptical silence.

[6] See Arregi and Nevins (2012) for another answer to this question, within a model that is not straightforwardly compatible with the assumptions adopted here (e.g., it is unclear how the numerous discrete "modules" in that work are able to communicate without violating Domain Specificity, given that no means of intermodular translation is proposed).

Thus, while Saab's approach comes closer to a strictly modular theory of elliptical silence than its predecessors...

- ...it ultimately entails a systematic violation of Domain Specificity.

But let's not throw the VI baby out with the Q-deletion bathwater (!?)

- Arguments for elliptical silence arising at VI are strong (for a recent summary, see Lipták and Güneş 2022:§2.3.4):
  - As we said above, it allows us to understand how ellipsis could:
    - disrupt allomorphy (Sailor 2022),
    - rescue cases of ineffability (Merchant 2015, Abels 2019, Mendes and Nevins, to appear), etc.
- What we need: a VI-based theory of elliptical silence that doesn't require syntax to directly 'instruct' VI.
  - VI should interpret the result of syntax like always, and then yield the silence we need...somehow.

4 A null exponence approach to elliptical silence

In what remains, I'll sketch one possible alternative.

- Pros: fully respects Modularity; and, silence is yielded at VI, where we want it.
- Cons: requires quite a powerful version of non-terminal insertion (with overwriting).

Proposal in a nutshell:

- Elliptical silence reflects insertion, not non-insertion.
- The silence is simply an exponent of [E] (plus a category feature), /Ø/, inserted on [E]'s phrase rather than its head.
  - Non-terminal insertion entails overwriting of prior instances of VI, here leading to total silencing of [E]'s domain.

Crucial assumption, motivated on entirely ellipsis-independent grounds:

- Radkevich (2010:§3.1.2) *Vocabulary Insertion Principle*, a theory of non-terminal insertion:[7]

(6) **The Vocabulary Insertion Principle** (Radkevich 2010:62)
The phonological exponent of a vocabulary item is inserted at the minimal node dominating all the features for which the exponent is specified.

- According to the VIP, VI proceeds inside-out/bottom-up as usual; however:
  - It must be able to operate on non-terminal nodes, and when it does,
  - it overwrites (or "overrides") its own prior output when a node is reached with a more suitable matching lexical entry than what was inserted lower.
- In brief, for a structure $[_{\alpha P}\ \alpha\ [_{\beta P}\ \beta]]$:
  - Insert at αP rather than at α *iff* there's a List 2 exponent specified for $[\alpha, \beta]$
  - In such a case, αP is the "minimal node dominating all the features" specified, in accordance with (6).[8]

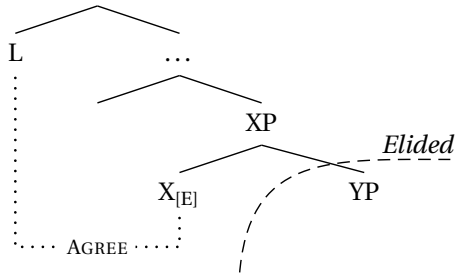
To see how this works, recall Aelbrecht's (2010) approach to ellipsis licensing:

[7] Nanosyntax also adopts non-terminal insertion: see e.g. Baunaz and Lander (2018:§1.3.3.2) (and see Caha 2018 for explicit comparison of the two). It may in fact be possible to formalize the proposal below in Nanosyntactic terms rather than the VIP: see Vanden Wyngaerd's (2018:286) discussion of how pointers interact with the Superset Principle for one possible starting point, though this remains to be worked out.

[8] The wording of the VIP as Radkevich (2010) gives it – and, in particular, her demonstration of it on p. 65 – makes the following (admittedly counterintuitive) effect quite clear: insertion at αP of an item specified for $[\alpha, \beta]$ is possible even if earlier instances of VI took place inside βP involving items specified for other features (e.g. $[\gamma]$). In other words, an exponent can overwrite an earlier item whose features it isn't actually specified for. It is this property that I exploit to capture the total silencing effect of /Ø/-insertion here; however, this property also makes the VIP an incredibly powerful – perhaps excessively powerful – insertion mechanism.

- Ellipsis is properly licensed *iff* an [E]-bearing head X undergoes an Agree relation with a higher ellipsis-licensing head L:

(7) Ellipsis licensing (Aelbrecht 2010:§3.2.3)



Whereas Aelbrecht takes this to result in non-insertion or "deletion at PF" of X's complement YP...

- ...I suggest that XP itself is rendered silent, following non-terminal insertion of /Ø/.

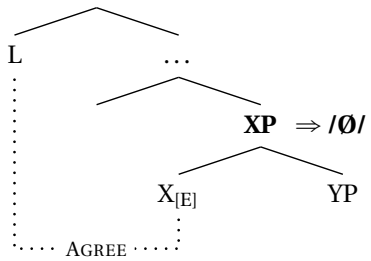
If a language allows elliptical silencing of YP, this amounts to a statement about its Vocabulary (in addition to licensing):

- Namely, that it contains **an exponent specified for [E, Y] which is null**: /Ø/.
- By (6), /Ø/ will be inserted on the minimal node dominating both the ellipsis feature [E] and the category feature [Y].
  - ▸ Namely XP in (7).
- This null exponent and its context of insertion within an Aelbrecht-style licensing configuration are illustrated below:[9]

(8) Ellipsis as null exponence (Sailor *in progress*)

a. List 2 entry resulting in a silent XP in an ellipsis context:
/Ø/ ⇔ [E, Y]

b.



For example, for ellipsis of *v*P (following its licensing within the narrow syntax):

- Insert /Ø/ on the minimal node dominating the features [E, *v*] (which, following the assumptions in Aelbrecht 2010:§4.2, would be VoiceP).

Essentially, this null exponence approach is akin to a **dramatic instance of portmanteau suppletion**:

- A single exponent realizes features spread across more than one head.
- An advantage of this proposal:
  - ▸ The silencing effect of ellipsis is mundane, requiring no special PF/phonological mechanism beyond what can be justified on ellipsis-independent grounds.

One alarming property of this analysis:

- Insertion of /Ø/ silences much more structure than just the heads bearing the relevant conditioning features:

[9] Given cyclicity and bottom-up VI, it is possible in principle for XP to be targeted for insertion prior to Merge of the ellipsis licensing head L (i.e., if the two are separated by a cyclic domain boundary). This does not pose a challenge for the present proposal, though: since [E] is part of the List 1 entry for X (rather than a property resulting from Agree with L), nothing will prevent insertion of /Ø/ at the point when XP is spelled out. Assuming VI has no effect on the narrow-syntactic representation, insertion of /Ø/ would not disrupt Agree between L and X at a later cycle (setting aside the independent question of whether Agree can cross a cyclic domain boundary). See Sailor (in progress) for further discussion.

- ▸ Also silences any YP-internal structures, for example.

- This is a straightforward consequence of non-terminal insertion and its concomitant overwriting procedure (both within DM and Nanosyntax: see references cited above).

- In practice, YP can dominate an arbitrarily-large structure, all the exponents of which are (correctly) overwritten by insertion of /Ø/ at XP.

Under this analysis, the licensing of ellipsis and its characteristic silence are only indirectly related:

- Unlike Aelbrecht's (2010) approach (also Merchant 2001, 2004), **ellipsis licensing does not cause the resulting silence**

  - ▸ It doesn't instruct VI not to apply, nor does it instruct PF to delete a constituent somehow (see above).

- Rather, both the licensing of ellipsis and its silence happen to make use of the same feature, [E].

- As such, **the two ought to be dissociable**:[10]

  - ▸ In principle, it should be possible to distinguish [E]-licensing (as analyzed in Aelbrecht 2010) from the silence of ellipsis.

  - ▸ For reasons that will become clear, let's call these properties of [E], rather than of ellipsis proper:

(9) **Formally distinguishing two properties of [E]**
  a. *[E]-licensing* in the narrow syntax
    (i) Induces a PIC-like effect on the complement of [E] (Aelbrecht 2010)
    (ii) Subjects the complement of [E] to identity effects (various)
  b. */Ø/-insertion* at VI
    (i) Induces the post-syntactic effects we've seen (bleeding of allomorphy, salvaging of ineffability, etc.)
    (ii) A fully lexical property, and thus subject to variation.

This last property predicts the following language / YP-'ellipsis' type:

- [E]-licensing takes place, inducing PIC and identity effects on YP, but

- This domain isn't silenced, because the language lacks /Ø/ as an exponent of [E, Y].

  - ▸ If the language simply has a morphological gap here, then presumably the result is ineffable (Merchant 2015, Abels 2019, Mendes and Nevins, to appear)[11]

  - ▸ But if the language has an overt exponent for [E, Y] – say, a pronominal-looking element – then...

    - **We derive surface anaphoric properties with an overt "pronominal".**

    - The syntax treats this domain as an 'ellipsis' site:

      - Internal structure = subextraction possible...

      - ...but [E]-licensing greatly limits the options: Aelbrecht 2010.

    - Whereas VI realizes this domain as a simplex-looking element.

- Does such a language / 'ellipsis' type actually exist? Yes:

  - ▸ Bentzen et al. (2013): surface anaphora in Norwegian and German have mixed properties like this:

[10] This doesn't entail that they should be doubly-dissociable. Note that one direction of dissociation can be ruled out: for insertion of /Ø/, [E] must be present in the derivation, and all instances of [E] must be properly licensed under Agree (see Aelbrecht 2010:§3.2.3 for details). In other words, we do not predict insertion of [E, Y] ⇔ /Ø/ to be possible in contexts where [E]-licensing doesn't take place.

[11] On this approach to elliptical silence, something more must be said about how morphological gaps can(not) be salvaged. In particular, the question arises: precisely when would a morphological gap cause a crash? If the answer is, "at the precise moment VI reaches for an exponent and finds nothing", then, assuming bottom-up VI, I would have a problem: VI might encounter a morphological gap node before it reaches its target for /Ø/ (whose insertion could otherwise solve the problem). However, if the answer is, "not until the end of the cycle" or "not until externalization", then this null exponence account can capture salvaged ineffability just as a non-insertion account can.

        - An overt pronominal in e.g. predicate position, and yet
        - Extraction (etc.) out of that domain is nevertheless possible.
    - **Perhaps these languages simply have overt exponents for [E, Y]** (for some category Y) rather than /Ø/.
- Requires us to think of overt surface anaphora as requiring [E]-licensing just like ellipsis; this may or may not be right.
- (Deep anaphoric properties would still arise in the usual way: a simplex structure in the syntax.)

Another consequence (noteworthy for its counterintuitiveness):

- The [E]-licensed node is actually smaller than, and immediately dominated by, the node realized as a null exponent: cf. (7) vs. (8b).
- This predicts a minor but systematic disparity between:
    - The domain of 'ellipsis'-induced PIC and identity effects on the one hand, and
    - The domain actually realized as silent on the other:
        - The latter will always be slightly larger than the former.
- Thus, there is an edge position inside the silence – [Spec, YP] – which is properly excluded from the [E]-licensed domain
    - This means only [Spec, YP] should not be subject to PIC and/or identity effects (but XP is).[12]
    - This may provide a means for understanding limited cases of non-identity in ellipsis…
        - …but this (and much more) remains to be explored carefully.

While this approach crucially relies on a non-standard model of Vocabulary Insertion,

- It has the strong advantage of complying with the constraints of Strict Modularity, unlike its competitors.

5 Conclusion

This talk has attempted to highlight some consequences of Strict Modularity for the theory of elliptical silence.

- In particular, two fundamental properties of modules seem to rule out common approaches involving "deletion at PF"
    - Domain Specificity requires each module's vocabulary to be proprietary;
    - Encapsulation prohibits addition of new input mid-computation.
- These properties, alongside a basic Minimalist heuristic to avoid redundancy (5), spell trouble for "deletion at PF":
    - Any of various possible implementations runs afoul of these premises.
- Likewise, non-insertion faces similar challenges:
    - Syntax cannot be in the business of issuing direct instructions to non-syntactic operations.

A Modularity-compliant alternative is required, and one was proposed:

- Ellipsis as null exponence, imposed by non-terminal insertion at the minimal phrasal node dominating [E].
- Fully testing the predictions of this proposal remains to be done.

[12] Strikingly, this configuration looks almost exactly like the fundamental phasal configuration, with [Spec, YP] enjoying significantly more freedom than the complement of Y. This parallel may be worth pushing further, but I leave this for future work.

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Appendix A: cyclicity and VI-based approaches to ellipsis

In any VI-based account of elliptical silence (either non-insertion or null exponence), something must be said about cyclicity:

- At a glance, such approaches are counter-cyclic.
  - Ellipsis of a very large (multi-phasal) constituent would seem to require VI to go back into completed cycles to undo and/or overwrite spelled-out List 2 items
  - This is doubly problematic for the replacive approach to VI that Saab adopts:
    - In such a case there isn't even anything for VI to replace—the placeholder variable was swapped out for a List 2 item on a prior cycle
    - If that variable is an essential part of the input to VI, it cannot operate twice on the same terminal.
- There are various ways of overcoming this; one option comes from a recent proposal in Murphy and Müller (2022:§3.3.2):
  - For reasons having nothing to do with VI, they argue that ellipsis is successive-cyclic in a striking way:
    - Ellipsis licensing proceeds bottom-up during the derivation: essentially, all cyclic domains within an ellipsis site are themselves also ellipsis sites (enforced via cyclic Agree among [E]-bearing phase heads).
    - In other words, ellipsis of TP (e.g.) requires independent ellipsis of the VP within it.
    - Thus, the counter-cyclicity problem is avoided under Murphy and Müller's approach.
- See Saab (2022:fn. 6) for further discussion.

Appendix B: Ellipsis is relevant to the allomorph selection calculus (Sailor 2022)

Taiwanese (Southern Min / Min Nan) is a lexical tone language, and is famous for its tone sandhi pattern ("TTS").

- If a syllable bearing a lexical ("citation") tone is in non-XP-final position,[13] it undergoes a predictable tonal alternation, surfacing with another tone instead.[14]
- Throughout, I **bold** syllables that have undergone sandhi (example adapted from Simpson and Wu 2002:74).

(10) **na**-**si** **A**-sin **m**-khi, **A**-hui **ma** **b**-**e** khi.
if A-Sin NEG-go A-Hui also NEG-IMPF go
'If A-Sin doesn't go, then A-Hui also won't be going.'

So this is a process that looks like it cares about syntactic structure,[15] and yet it seems to manipulate phonological material.

As we'll now see, it consistently seems to apply after ellipsis has taken place:

- Ellipsis seems to create new XP-final configurations, as far as the TTS 'rule' is concerned (but see below)
- i.e., syllables that would've undergone sandhi if ellipsis hadn't taken place instead arise in citation form.

First consider data from Taiwanese predicate ellipsis ("VPE"; see Sailor and Kuo 2010 for details):

(11) a. **A**-Ying chang **b**-**o** **khi** **hak**-hau, **tan**-**si** **A**-Ha **u** **khi** **hak**-hau.
A-Ying yesterday NEG-PERF go school but A-Ha PERF go school
'A-Ying didn't go to school yesterday, but A-Ha did go to school.'

[13] This is an oversimplification, as adjunction complicates the characterization of the sandhi domain: essentially, the final syllable of an XP will undergo sandhi just in case that XP is an adjunct. For extensive discussion of these and other complications, see Chen (2000: ch. 10); these do not bear on the present discussion, so I leave them aside.

[14] Taiwanese and Xiamen (Southern Min) tone sandhi involves circular chain shift, a type of counterfeeding opacity that is notoriously difficult to capture in both rule-based and OT-style frameworks. Neither this property nor the actual tones involved (citation or sandhi) bear on the present discussion, which is only concerned with where and when sandhi takes place; therefore, I leave discussion of them aside. See Chen (1987, 2000) and Zhang et al. (2006), among others, for extensive discussion.

[15] For arguments that Taiwanese tone sandhi domains cannot be defined prosodically, see Chen (1987:143) and Tsay and Myers (1996:399). The above arguments against prosodic constituency cross-apply here, as well.

b. **A**-Ying chang **b**-**o** **khi hak**-hau, **tan**-**si** **A**-Ha { u / *__u__ } ~~[khi hak-hau]~~.
A-Ying yesterday NEG-PERF go school but A-Ha PERF
'A-Ying didn't go to school yesterday, but A-Ha did.'

The crucial contrast is between *u* 'PERF' in (11a) vs. (11b):

- In the former, *u* is in a non-XP-final position, and thus undergoes sandhi;
- In the latter, *u* evidently finds itself in an XP-final position at the relevant point, and thus appears with its citation tone.

This effect arises in other ellipsis environments as well, e.g. in nominal ellipsis:

(12) a. **Chi**-Beng **beh sann pun** chhe, **A**-Ying **beh si** **pun** chhe.
Chi-Beng buy three CL books, A-Ying buy four CL book
'Chi-Beng bought three books, and A-Ying bought four books.'
b. **Chi**-Beng **beh sann pun** chhe, **A**-Ying **beh si** { pun / *__pun__ } ~~[chhe]~~.
Chi-Beng buy three CL books, A-Ying buy four CL
'Chi-Beng bought three books, and A-Ying bought four.'

- In (12a), *pun* 'CL' undergoes sandhi as usual in non-XP-final position.
- In (12b), *pun* is in XP-final position at PF, and thus cannot undergo sandhi, arising instead with its citation tone.

Thus, ellipsis seems to have taken place by the time tone sandhi is assessed...

- ...on the assumption implicit in Merchant (2001, inter alia) that an elided XP can be sent to PF with other cycle-internal material adjacent to it such as the classifier *pun*. (We return to this below.)

Of course, the probative value of these facts is inherently limited by the timing of tone sandhi:

- If TTS happens very late in the phonology, then the fact that ellipsis precedes it would tell us relatively little about when the silence of ellipsis takes hold.
- Indeed, there are reasons one might assume that TTS applies rather late:
  - Superficially, it seems to be a system of phonological rules manipulating lexically-specified tones; so, obviously, linearization and Late Insertion need to precede it
  - Some studies even claim that phonetic information influences the application of TTS (Zhang et al. 2006);
    - Could be taken to indicate that TTS occurs near the very end of the phonological computation, at the phonology-phonetics interface.
- If correct, the facts above would be telling us little more than "the silence of ellipsis arises at some point before the very end of phonology"—a trivial conclusion.

However, there is at least one significant reason to believe that TTS actually applies much earlier than this:

- There is substantial evidence suggesting that TTS is not actually a phonological process, but rather the effect of contextual allomorphy in the DM sense (Bobaljik 2000)
  - If correct, would mean that the effects of TTS arise outside the phonology module completely, namely during Late Insertion (where allomorphy is handled)
- This allomorphy-based approach to TTS was first proposed in Tsay and Myers (1996), motivated primarily on theory-internal grounds.[16]
- But since then, compelling evidence has come from work showing the sheer non-productivity of TTS.

[16] In brief, Taiwanese tone sandhi poses a challenge for some phonological theories that draw a strict distinction between phrasal phonology on one hand and lexical phonology on the other: like many sandhi systems, it seems to apply at the phrasal level (i.e. it is not word-bounded), but it nevertheless exhibits characteristics more consistent with lexical phonology (e.g. it has exceptions, it is not fully productive, etc.). See Tsay and Myers (1996) for discussion and references (and see Scheer 2012: ch. 3 for an entirely non-phrasal approach to external sandhi phenomena).

- Several nonce-word experiments in the literature have shown it to be largely unproductive: for instance, the experiment in Zhang et al. (2006) resulted in just 11.5% correct application of tone sandhi to nonce words, with the overwhelming majority (82.9%) undergoing no change in tone whatsoever, i.e. non-application.
- Speakers simply fail to learn the system of opaque rules necessary to generate the sandhi system (see fn. 14).
  - Instead, they must store all sandhi and citation forms together as allomorphs.
    - Nonce-words can have no allomorphs, hence non-application.
  - See Chen et al. (2010) for experimental results supporting this view of TTS, and McPherson (2019) for recent extension of this view to the tone sandhi system in Seenku (Mande).

- In light of this, the ellipsis facts above become much more informative:
  - Evidently, **the silence of ellipsis is relevant to the allomorph selection calculus**.
  - That is, silence must arise no later than at Late Insertion.

So the hits keep coming for a phonological deletion approach to ellipsis:

- Deleting during the phonology is just too late, even if you could make it work from an MP-friendly modular perspective (and you can't).