The prosodic licensing of left-edge ellipsis and implications for clausal ellipsis*

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1   Introduction

This talk has three main empirical foci:

(1)   **Left-edge ellipsis** in spoken English, of the form illustrated below:
   a.   Seen the new Star Wars film yet? (= ~~Have you~~ seen . . .)
   b.   Won't bother seeing it, I think. (= ~~I~~ won't bother. . .)
   c.   You gonna see it? (= ~~Are~~ you gonna. . .)

(2)   **Fragment answers**, i.e.:
   a.   What did John eat? — Chips. (= ~~He ate~~ chips.)
   b.   What will he do then? — Go to the store. (= ~~He will~~ go to the store.)

(3)   The **interaction** between (1) and (2).

I will argue that **left-edge ellipsis** is a prosodic phenomenon, resulting from the satisfaction of the STRONGSTART constraint (Selkirk 2011, also Elfner 2012, Bennett et al. to appear), penalizing 'weak' starts to utterances (building on work in Weir 2012).

- However, various restrictions on left-edge deletion will lead me to conclude (along with e.g. Zwicky & Pullum 1983) that this deletion takes place at the level of *lexical insertion*, rather than at a level of 'phonology proper'. I propose that this deletion is located at the syntax-phonology interface – a level of grammar that has access to both syntactic and prosodic structure.

I will argue that the ellipsis that takes place to generate **fragment answers** also takes place at the syntax-phonology interface, but is not an instance of precisely the same phenomenon as left-edge ellipsis.

- The generation of fragment answers, I argue, requires access to syntactic structure, as it shows hallmarks of syntactic movement.

- However, I suggest (building on arguments in Weir 2014) that this movement has no interpretive consequences, and takes place at PF only, not LF – i.e. at the syntax-phonology interface.

I further support this conclusion by adducing some curious data concerning the interaction of left-edge ellipsis and fragments: the availability of fragment ellipsis **bleeds** the possibility of left-edge ellipsis.

- In (4), a full clausal answer is possible (4a), as is a fragment (4b). However, doing left-edge ellipsis of *it's* is strikingly ungrammatical (4c) – even though left-edge ellipsis of *it's* is possible in all-new contexts (5).

(4)   Who is it that I should I talk to about that?
        a.   It's JOHN that you should talk to about that.
        b.   JOHN.
        c.   *~~It's~~ JOHN that you should talk to about that.

(5)   ~~It's~~ nice weather that we're having today.

- I argue that this interaction can only be satisfactorily explained if *both* left-edge ellipsis and fragment answer ellipsis are taking place at the syntax-prosody interface.

This talk will **not** touch on the following:

- **Whether left edge deletion is responsible for non-constituent coordination.** Wilder 1994, 1997 proposes that cases like *He talked to Bill on Tuesday and Ted on Wednesday* are derived via a process of 'left-edge ellipsis': *He talked to Bill on Tuesday and ~~he talked to~~ Ted on Wednesday*. I have not tried to consider this phenomenon, which seems more complicated (see e.g. Sailor & Thoms 2014 and Bruening 2015 for some recent debate), only considering the non-coordination cases of the sort in (1).

- **Diary drop/ellipsis in written register.** Cases like *Am going to the gym today* are possible in diaries, but these show different properties from left-edge ellipsis in speech (Haegeman 1990, 1997, 2007, Weir 2012). I won't consider written register here, and any examples given should be taken as belonging to spoken English.

- **Topic drop/pronoun 'zap' in Germanic.** The issues considered here are surely relevant to cases like *~~Das~~ hab' ich schon gesehen* '~~that~~ have I already seen', as these are also 'left-edge' (see e.g. Sigurðsson & Maling 2010); but I haven't considered whether the analysis I present here can extend to languages beyond English.

The talk proceeds as follows:

- Section 2 proposes a constraint-based OT model of left-edge ellipsis at the syntax-phonology interface (building on Weir 2012).

- Section 3 discusses how the clausal ellipsis seen in fragment answers can also be implemented at the same interface level in the grammar.

- Section 4 shows how the data in (4) can be simply captured in such a model.

- Section 5 concludes.

2 Left-edge ellipsis

2.1 The data: deletion at the edge of an intonational phrase

It is quite common in English to 'leave off' material at the left edge (Schmerling 1973, Napoli 1982, Zwicky & Pullum 1983, Gerken 1991, Wilder 1997, Fitzpatrick 2006, Weir 2012 a.o.)

(6) a. Going to the gym later. (= I̶'̶m̶ going. . .)
     b. You going to the gym later? (= A̶r̶e̶ you going. . .)
     c. Seen the new Star Wars film yet? (= H̶a̶v̶e̶ ̶y̶o̶u̶ seen. . .)
     d. You seen the new Star Wars film yet? (= H̶a̶v̶e̶ you seen . . .)
     e. Won't bother seeing it, I think. (= I̶ won't bother. . .)
     f. Nice day today. (= I̶t̶'̶s̶ ̶a̶ nice day. . .)
     g. Great talk you gave yesterday. (= T̶h̶a̶t̶/̶I̶t̶ ̶w̶a̶s̶ ̶a̶ great talk. . .)
     h. A: Is this a good restaurant?
         B: Man over there seems to think so. (= T̶h̶e̶ man over there. . .) (from Gerken 1991)

This kind of ellipsis is notably not sensitive to syntactic constituency.

- the elided material does not need to form a constituent (it does not in (6a, c, f, g), and only does in the others trivially because what is elided is a single word)

- the remnant does not need to form a constituent either (it does not in (6f, g, h))

And it is not available at the left-edge of embedded clauses:

(7) a. *I think I̶ won't bother seeing it.
     b. ??He said t̶h̶e̶ man over there told him so.

I argue (along with Napoli 1982, Gerken 1991 and others) that such deletion is:

- **prosodically-driven deletion**

- of **unstressed material**

- at the left edge of an **intonational phrase**

Further evidence in favor of the prosodic status of the deletion will be given below. Note that the deletion is licensed after intonational breaks; for example, parentheticals can show left-edge deletion, as can 'paratactic' utterances of the form in (8c), and 'follow-up' utterances such as (8d):

(8) a. John Smith – t̶h̶e̶ guy over there with the hat – wants to talk to you.
     b. The new Star Wars film – I̶'̶v̶e̶ not seen it myself yet – gets good reviews.
     c. I've been meaning to ask, h̶a̶v̶e̶ you seen the new Star Wars film yet?
     d. Are you going to see the new Star Wars film? — Yeah, I̶ thought I would.

2.2 StrongStart

Weir 2012 proposes that such material undergoes a process of prosodically conditioned deletion to satisfy the STRONGSTART constraint.

(9)   STRONGSTART (originally from Selkirk 2011, formulation below from Bennett et al. to appear)
       Prosodic constituents above the level of the word should not have at their left edge an immediate sub-constituent which is prosodically dependent (smaller than a prosodic word).

I consider a specific variant of this constraint, STRONGSTART-ι:[1] intonational phrases should not start with prosodically dependent constituents.

- This is the constraint that I argue is responsible for deletion at the left edge of an intonational phrase.

- I give a first, schematic version of the argument, before formalizing it further below.

- Following Selkirk 1995 I assume that lexical material – terminals of category N, A, V – are parsed into prosodic words, while functional material – D, C, P etc. – is not; such material is parsed into syllables which are then 'directly' dominated by a higher-level prosodic category, without being parsed into a prosodic word.[2]

- An utterance like *I'm going to the gym later* therefore contains a syllable (σ) *I'm*, not parsed into its own prosodic word, followed by the verb *going*, which is parsed into its own prosodic word (ω); the VP is parsed into a phonological phrase (ϕ) (which I don't show the parse of in greater detail). The whole thing is parsed into an Intonational Phrase (ι).

  (10)   ($_\iota$ ($_\sigma$ I'm) ($_\phi$ ($_\omega$ going) to the gym later))

- The parse in (10) represents a violation of the STRONGSTART constraint, as the intonational phrase starts with a weak syllable.

- To repair this violation, it's possible to delete the initial weak syllable: *going to the gym later* satisfies the STRONGSTART constraint.

- To capture the optionality of the process, I propose that, per utterance, STRONGSTART can be variably ranked with respect to a constraint of the MAX type, which penalizes deletion.

- If, for any given utterance, MAX is ranked above STRONGSTART, then deletion does not take place. If STRONGSTART is ranked above MAX, then deletion of initial weak syllables does take place.

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[1]Weir 2012 decomposes STRONGSTART into three separate constraints: STRONGSTART-ι, STRONGSTART-ϕ, and STRONGSTART-ω. In that paper I argued that this decomposition was required to capture the 'gradual' nature of left-edge ellipsis (i.e. both *You seen it yet?* and *Seen it yet?* are OK). I am not however currently sure whether this is the best way of handling those facts, and am concerned that this decomposition might lead to overgeneration of deletion. As I am only concerned with ιP-initial deletion here, I will only consider STRONGSTART-ι. See also footnote 11 for discussion of these cases.

[2]This assumes that the Strict Layer Hypothesis is not inviolable, which is a conclusion argued for by Selkirk 2011, Elfner 2012, a.o.

(11)

I'm going to the gym later	MAX	STRONGSTART
☞ a. $(_\iota$ $(_\sigma$ I'm) $(_\phi$ $(_\omega$ going) to the gym later))		*
b. $(_\iota$ $(_\phi$ $(_\omega$ going) to the gym later))	*!	

(12)

I'm going to the gym later	STRONGSTART	MAX
a. $(_\iota$ $(_\sigma$ I'm) $(_\phi$ $(_\omega$ going) to the gym later))	*!	
☞ b. $(_\iota$ $(_\phi$ $(_\omega$ going) to the gym later))		*

- As evidence for this prosodic treatment of left-edge deletion, note that, if left-edge ellipsis is used, certain auxiliaries (like *have* and *be*) *must* be deleted (Schmerling 1973, Napoli 1982, Zwicky & Pullum 1983, Weir 2012).

- That is, in (13) and (14), the subjects cannot be deleted to the exclusion of the auxiliary verbs.

(13)   a.   *Have just been sent a nasty email.
         b.   Just been sent a nasty email.

(14)   a.   *Is looking kind of rainy outside.
         b.   Looking kind of rainy outside.

- It's not immediately clear how to capture this on a 'syntaxy' view of what's going on here. On such a view, it's not very clear what would force the deletion of an auxiliary just in case the subject was deleted.

- However, this pattern can be understood in terms of STRONGSTART driving deletion.

- If any deletion is taking place, then STRONGSTART must be ranked above MAX.

- However, *have* and *is* are unstressed auxiliaries which are not parsed into their own prosodic word. They therefore violate STRONGSTART.

- It is therefore more optimal, under the ranking STRONGSTART ≫ MAX, to delete these auxiliaries as well as the subject.

- There is no way of ranking the constraints which makes deletion of the subject alone optimal – either nothing is deleted, or both subject and *is* are deleted.

(15)

It is looking kind of rainy	STRONGSTART	MAX
a. $(_\iota$ $(_\sigma$ it) $(_\sigma$ is) $(_\phi$ looking kind of rainy))	*	
☠ b. $(_\iota$ $(_\sigma$ is) $(_\phi$ looking kind of rainy))	*	*
c. $(_\iota$ $(_\phi$ looking kind of rainy))		**

- However, if *-n't* negation is added to these auxiliaries, then ellipsis of the subject becomes fine (as the above-mentioned authors note).

(16)   a.   Haven't been sent any nasty emails.
         b.   Isn't looking very nice outside.

- Again, this is mysterious on a syntactic view, but more understandable on a prosodic view.

- I assume that the 'augmentation' of the auxiliary with the *-n't* negation causes *haven't* and *isn't* to be parsed as prosodic words, rather than as mere syllables.

- As such, examples like (16) are not violations of SMALLCAPS STRONGSTART.

(17)   ($_\iota$ ($_\phi$ ($_\omega$ haven't) been sent any nasty emails))

2.3   Just phonology?

There are some restrictions that suggest that left-edge ellipsis is more complicated than this, though.

Firstly, as noted by Zwicky & Pullum 1983, not all 'weak' material on the left edge can in fact undergo deletion. Prepositions, for example, cannot be deleted, even though they represent 'weak starts'.[3]

(18)   a.   In Paris I ate a lot of nice food.
        b.   *Paris I ate a lot of nice food.

(19)   a.   For him I would do anything.
        b.   *Him I would do anything.

- Zwicky & Pullum 1983 (attributing the observation to Akmajian et al. 1979) and Fitzpatrick 2006 note that not all auxiliaries can undergo deletion, either.

- In fact, only *have*, *be*, and dummy *do* can be deleted – other modals cannot.[4]

- For example, the below cannot easily be interpreted as ellipsis of the auxiliary *will*, or the subject+auxiliary combination *I'll*.

(20)   a.   #You go see the new Star Wars film?
              (intended: ~~will~~ you go see. . .)
        b.   #Go see the new Star Wars film?
              (intended: ~~will you~~ go see. . .)
        c.   #Go see the new Star Wars film today.
              (intended: ~~I'll~~ go see. . .)

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[3]An exception to this may be *as* in *as far as I can tell*: as noted by Thrasher 1973 (cited in Zwicky & Pullum 1983), *Far as I can tell, there's nothing to his claim* is grammatical. It doesn't seem completely general though: ??*~~As~~ for John, he's a good guy*. We also find the reduction of *For god's/fuck's sake* to *God's/fuck's sake*. I have no explanation for these patterns currently except to suggest that such cases may be fixed expressions, though that raises the question of how they became fixed.

[4]This may not be universally true, however. I accept sentences like (i) with the meaning of an elided *can*, but I think I am an outlier, and Zwicky and Pullum mark such sentences as ungrammatical.

(i)   %You not just try restarting it? (= ~~Can~~ you not just try restarting it?)

The negation may be important here; ??*~~can~~ you just try restarting it?* is not as good.

Cases like (21) present more mysteries for a phonological account.

(21)   a.   Anyone in town and fancy a pint?
           b.   Got diabetes and planning to fast for Ramadan?[5]
           c.   New student and need an access card?[6]

Such sentences appear to be conjunctions of two T′s[7], with ATB movement of the subject and of an auxiliary, and deletion of the auxiliary (and possibly further material, as in (21b, c)).

(22) $[_{CP}$ ~~Aux~~$_j$ $[_{TP}$ anyone$_i$ t$_j$ $[_{\&P}$ $[_{T'}$ t$_j$ $[_{vP}$ t$_i$ in town]] and $[_{T'}$ t$_j$ $[_{vP}$ t$_i$ fancy a pint]]]]]

- In support of T′ being present in the conjuncts of structures like these (rather than only consisting of 'bare' coordinated vPs or even VPs), note that nominative case is available for the subject if expressed, and in fact this is the the only case available.

- Furthermore, TP-level adverbs (such as epistemic or temporal adverbs) are grammatical in both conjuncts. (Fitzpatrick 2006 presents these and other arguments for 'simple' cases of aux drop, without the conjunction complication)

(23)   (?They/*Them) in town and fancy a pint?
        (compare 'default accusative' in 'bare' verb phrases: *What, me worry?*)

(24)   a.   Always tired and need more coffee?
           b.   Tired and always need more coffee?
           c.   Anyone perhaps heading up town and fancy a pint?
           d.   Anyone heading up town and perhaps fancy a pint?

But: there are no possible overt sources for these cases!

(25)   a.   *Is anyone in town and fancy a pint?
           b.   *Does anyone in town and fancy a pint?
           c.   *Is there anyone in town and fancy a pint?

(26)   *Have you got diabetes and planning to fast for Ramadan?

(27)   *Are you a new student and need an access card?

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[5]The original was *Have diabetes and planning to fast for Ramadan?*, spotted on the 'Diabetes UK' Facebook page. This is a written case and, for unclear reasons, is more liberal (allowing *have* to stand alone), but the point is made for spoken register with the variant with *got*.

[6]The Norwegian version of this sentence (*Ny student og trenger adgangskort?*) was spotted on a sign at NTNU. There seems to be something more complicated going on with the Norwegian example, as the verb *trenger* 'need' is within a vP when it 'should' have moved to C. It's possible that this is related to the 'exotic' co-ordination structures in Germanic discussed by Höhle 1990, Johnson 2002. The puzzles raised by this are left for future work; thanks to Chris Wilder for discussion.

[7]Alternatively, conjunction of two TPs, with subjects ATB-moving to a higher functional projection, e.g. AgrSP or SubjP (Rizzi & Shlonsky 2007).

Note that we can't appeal to full clausal conjunction and some form of independent ellipsis in the right conjunct, as in (28).

(28)   a.   ~~Is~~ anyone in town and ~~do they~~ fancy a pint?
        b.   ~~Do you~~ have diabetes and ~~are you~~ planning to fast for Ramadan?
        c.   ~~Are you a~~ new student and ~~do you~~ need an access card?

- Such ellipsis in the right conjunct should in principle be possible independently of ellipsis in the left conjunct, but it is not – if it were, then the alternative sources suggested above should be grammatical.

- In addition, the below example cannot be paraphrased with a clausal conjunction containing a pronoun.

(29)   No-one in town and fancy a pint?

- (29) asks: is there no x such that x is in town and x fancies a pint. That is, the subject of the right conjunct is a variable bound by *no-one*, as we would expect on an analysis where the subject has ATB-moved.

- But that's not what a putative clausal-conjunction-plus-ellipsis source, as in (30), would mean; in fact, such a source seems semantically ill-formed, due to the lack of referent for the pronoun *they* (which cannot be bound by *no-one* over the clause boundary):

(30)   #Is no-one in town and do they fancy a pint?

2.4   Left-edge ellipsis as failure of lexical insertion

The conclusion I draw from the data above is that left-edge ellipsis of auxiliaries is not *purely* a process of phonological deletion.

- Purely phonological deletion would require a well-formed pre-deletion source, but that doesn't seem to be available in cases like *anyone in town and fancy a pint*.

- In addition, it's not clear why purely phonological deletion should not be able to delete prepositions, or auxiliaries like *will*. (Phonological deletion shouldn't be sensitive to *what* it deletes.)

To understand this, I propose that left-edge deletion, while still driven by the need to satisfy STRONGSTART, involves the insertion of **null lexical items** for certain categories – namely auxiliaries and determiners.

- That is: the lexicon of English contains a 'null spellout' for these functional categories – but crucially has no null spellout corresponding to a P, accounting for the fact that prepositions cannot be dropped.

- Locating the ellipsis of these items in the morphophonological component (after 'syntax proper'), and lexically specifying which items can be elided, is proposed by Zwicky & Pullum 1983 – however, they propose the *deletion* of certain *contentful* lexical items, while I propose the *insertion* of *null* items.

- These null lexical items can be considered as 'default' or 'elsewhere' forms, underspecified for meaning and for featural content. This builds on Fitzpatrick 2006, who proposes that the grammar assigns deleted auxiliaries on the left edge a sort of 'default' interpretation.[8]

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[8]Fitzpatrick adopts a phase-based analysis, where material in the highest phase (i.e. auxes that move to C) can fail to spell out. However, as the phenomenon of left-edge ellipsis appears to be more general than moved auxiliaries (i.e. it can elide auxes in T as well, in addition to pronouns in [Spec, TP], etc.), and moreover seems to be sensitive to prosodic facts, I do not adopt this view here.

- The auxiliaries that can be dropped (*have, be, do*) are not independently semantically meaningful – they are 'syntactic glue'. As such, they can in principle be replaced by the null form.

- However, more contentful items like *will* can't be dropped (i.e. null lexical items cannot be inserted in their place), as these have semantic content that cannot be recovered from the underspecified null form.

With this in place, we can understand the puzzle of *Anyone in town and fancy a pint?*:

- This sentence can't contain an overt auxiliary in C, as that would involve ATB-moving two unlike auxiliaries (*is* and *does*).

- However, if the auxiliaries involved can be spelled out as $\emptyset$, then ATB-movement becomes possible:

(31) $[_{CP} \emptyset_j [_{TP} \text{anyone}_i \ t_j \ [_{\&P} [_{T'} \ t_j \ [_{vP} \ t_i \ \text{in town}]] \text{ and } [_{T'} \ t_j \ [_{vP} \ t_i \ \text{fancy a pint}]]]]]$

- I argue that pronouns and determiners that 'go missing' under left-edge drop plausibly work in the same way: these are null lexical items, which are underspecified for meaning by themselves, but receive interpretations from context.

- Clearly there is a lot more to say about the range of meanings that these items can receive – but the precise nature of the interpretation of the null determiners and pronouns invoked in left-edge ellipsis is left here to future work.[9]

- The fact that deleted left-edge auxiliaries can apparently be underspecified for interpretation suggests that a null lexical insertion analysis (at least for auxes) is on the right track – which suggests that the same may be true for pronouns and determiners.

- However, as discussed above, the *licensing* condition on inserting these null items seems to be prosodic in nature – null elements cannot show up just anywhere, but must be at the start of an intonational phrase.

- I now propose a detailed model of the syntax-phonology interface that seeks to capture this interaction.

2.5   Left-edge ellipsis at the syntax-phonology interface

I propose that left-edge ellipsis takes place at the syntax-phonology interface.

- Crucially, I assume that this level of the grammar is the domain of lexical insertion – that is, lexical insertion happens 'late' (as in e.g. Distributed Morphology)

- It is also the domain in which prosodic structure is assigned – it has access both to syntactic structure and to phonological/prosodic structure.

- I assume an optimality-theoretic, constraint based model for this level of the grammar.

- The input to the model is a syntactic tree with only feature bundles at the terminals – i.e. before spellout of the lexical material.

- The output is a pair of a syntactic tree with lexical items inserted, and a prosodic parse for this tree.[10]

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[9]I suspect the range of interpretations for the null determiner might be usefully linked to the interpretations that null determiners can get in written registers ($\emptyset$ *Man bites* $\emptyset$ *dog*), which I consider in Weir to appear.

[10]The reason why it is important to have a syntactic tree as part of the output will become clear later on in the discussion of fragments.

I consider a simplified model, with four constraints (one of which is a cover term for a family of constraints).

(32)   RECOVERABILITY
         Any null pro-form must be recoverable.

The above is an undominated constraint – maybe even a constraint on GEN/the set of candidates.

(33)   MAPPING
         Syntactic structure maps to prosodic structure. In particular:

         a.   root utterances map to intonational phrases;
         b.   lexical XPs map to phonological phrases;
         c.   lexical X^0s map to prosodic words.

This is a cover constraint for however we want to implement the syntax-prosodic mapping in general terms. This formulation is loosely based on the MATCH constraints in Selkirk 2011, but I do not think the formulation is crucial here.

(34)   MAX
         Every terminal node in syntax should be mapped to a contentful phonological representation. (I.e. insert spelled-out lexical items, rather than null ones.)

(35)   STRONGSTART-ι
         An intonational phrase should not have at its left edge an immediate sub-constituent which is prosodically dependent (smaller than a prosodic word).

I exemplify below how this model works for the sentence *have you seen the film?*. Note that I assume that weak pronouns are *not* lexical categories but rather functional ones, and these therefore get parsed into syllables only, not prosodic words or phonological phrases.

(36)

$[_{CP}$ T$_i$ $[_{TP}$ D $[_{TP}$ t$_i$ $[_{VP}$ V DP$]]]]$	RECOV	MAPPING	MAX	STRST
a. $[_{CP}$ $[_T$ Have$]$ $[_{TP}$ $[_D$ you$]$ $[_{VP}$ $[_V$ seen$]$ $[_{DP}$ the film$]]]]$ $(_\iota$ $(_\sigma$ have$)$ $(_\sigma$ you$)$ $(_\phi$ $(_\omega$ seen$)$ $(_\phi$ the film$)))$				*

- We can see that this sentence, because of the weak *have* and *you*, contains a weak start for the intonational phrase.

- Given the ranking shown above, where MAX ≫ STRONGSTART, the output *have you seen the film?* is optimal.

- I propose that the output *seen the film?* is generated if MAX is placed below STRONGSTART.

- MAX penalizes the insertion of null terminals as realizations of terminal nodes. We need a constraint like this, and it needs to be fairly high-ranked, as we do not want null pronouns or auxiliaries to be freely insertable (*I devoured ~~it~~, *he ~~has~~ seen the film).

- However, I propose that MAX can be ranked below STRONGSTART. If this is the case, then the insertion of these null terminals is tolerated if it results in a strong start for the intonational phrase.

- From now on, I will abbreviate tableaux by omitting the MAPPING constraint. I will assume that this is always active, and prevent 'repairs' of the STRONGSTART violation such as 'promoting' *have* and *you* into full prosodic words.[11]

(37)

[CP T$_i$ [TP D [TP t$_i$ [VP V DP]]]]	RECOV	STRST	MAX
a. [CP [T Have] [TP [D you] [VP [V seen] [DP the film]]]] ($_\iota$ ($_\sigma$ have) ($_\sigma$ you) ($_\phi$ ($_\omega$ seen) ($_\phi$ the film)))		*	
☞ b. [CP [T ∅] [TP [D ∅] [VP [V seen] [DP the film]]]] ($_\iota$ ($_\phi$ ($_\omega$ seen) ($_\phi$ the film)))			**

- Auxiliaries like *will* are not deletable, as there are no null pro-forms that correspond to their meaning – there would therefore be a violation of RECOVERABILITY (which I assume to be undominated.)

- This has an interesting effect: it becomes ungrammatical to do any left-edge deletion if the auxiliary is *will*, even of the pronoun (which is recoverable).

- Deleting just the pronoun doesn't help the STRONGSTART problem. With any ordering of MAX and STRONGSTART, the optimal outcome is not to delete anything.[12]

(38)

[CP [TP D [T' T [VP V DP]]]]	RECOV	STRST	MAX
☞ a. [CP [TP [D I] [T' will [VP [V see] [DP the film]]]]] ($_\iota$ ($_\sigma$ I) ($_\sigma$ will) ($_\phi$ see the film))		*	
b. [CP [TP [D ∅] [T' will [VP [V see] [DP the film]]]]] ($_\iota$ ($_\sigma$ will) ($_\phi$ see the film))		*	*
c. [CP [TP [D ∅] [T' ∅ [VP [V see] [DP the film]]]]] ($_\iota$ ($_\phi$ see the film))	*		**

In summary: ranking MAX below STRONGSTART leads to the optimal outcome being the deletion of (formally Recoverable) material at the left edge of an intonational phrase.

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[11]Other repairs are conceivable, though; for example, letting the weak pronoun cliticize into the following phonological phrase. This may well be what is going in in a form like *Ya seen the film? – have* is deleted, but the pronoun can be preserved by cliticization: ($_\phi$ ya seen ($_\phi$ the film)). I have not yet tried to work out if there's a consistent ordering of the constraints I propose here that would allow this – I focus only on the candidates with 'full' left-edge deletion here.

[12]Note that this assumes that STRONGSTART is a categorical constraint – either it's violated or it isn't. If it were gradient, then the (a) candidate in (38) would have two violations of STRONGSTART and would not harmonically bound (b).

3   Turning to fragments

3.1   Fragments as clausal ellipsis

I now turn to an apparently entirely different type of ellipsis: fragment answers. I assume without discussion that short/fragment answers like those in (39a) are derived via ellipsis from full clausal answers like (39b).[13]

(39)   What did John give to Mary?
    a.   The big blue book.
    b.   John gave the big blue book to Mary.

The justification for this comes from case connectivity effects, binding connectivity effects, and various other evidence of full clausal structure (Merchant 2004). With this accepted, there are (broadly speaking) two views about how this sort of ellipsis arises.

- **View 1: the movement-plus-deletion approach:** ellipsis is a process that targets syntactically-defined constituents. If what has been elided looks like a non-constituent, this is because the ellipsis 'remnant' has moved outside the ellipsis site. (Merchant 2004 and much subsequent work.)

    (40)   [$_{CP}$ [$_{DP}$ The big blue book] [$_{TP}$ ~~John gave t to Mary~~]]

- **View 2: the in-situ approach:** ellipsis is a phonological or prosodic process, a form of extreme deaccenting à la Tancredi 1992. The issue of 'non-constituent ellipsis' doesn't arise, as the process is not sensitive to syntactic constituency. Brueing 2015 is a recent proposal of this view.

    (41)   ~~John gave~~ the big blue book ~~to Mary~~

I will assume that View 1 is correct, in view of phenomena such as the P-stranding generalization (Merchant 2001, 2004): in languages where prepositions must pied-pipe under movement, prepositions also appear in fragment answers, suggesting a movement derivation.

(42)   Mit wem   hat Anna gesprochen? – *(Mit) dem Hans.
         with whom has Anna spoken   with   the Hans
         'Who did Anna speak to? – (To) Hans.'

In addition, Barros et al. 2015 note that left-branch adjectives cannot be fragment answers – expected if they are subject to syntactic constraints on movement:

(43)   Did he hire an *experienced* writer?
    a.   No, he hired a budding writer.
    b.   *No, budding. (cf. *Budding, he hired a t writer*)[14]

---

[13]That is, I am passing over non-sentatialist views where such fragments are generated 'directly', such as e.g. Ginzburg & Sag 2000, Stainton 2006, Jacobson 2013, etc.

[14]An adjective like *budding*, which cannot be in predicative position, is needed to ensure that the elliptical source here is not something like *Budding ~~he is t~~*, as Barros et al. discuss.

3.2   Fragments as PF movement

- I assume, therefore, that some form of syntactic movement is implicated in the generation of fragments.

- However: Weir 2014, 2015 argues that, even if fragments are moving in syntax, they do not look like they've moved for the purposes of *semantic* interpretation.

- For example, NPIs can be fragments (see also den Dikken et al. 2000, Valmala 2007), even though it's not generally possible to move NPIs out of the scope of their licensor.

(44)   (den Dikken et al. 2000's fn. 3, (i, ii), adapted)

       a.   John has returned with the shopping for the party. A and B know that he bought cheese, olives, and juice, but suspect that he has forgotten something.

       b.   A: What didn't he buy?   B: Any wine.

(45)   *Any wine, he didn't buy.

- In addition, fragments do not show the Lebeaux effects that are characteristic of A′-movement – i.e. Condition C is not bled in fragments.

(46)   a.   *He$_i$ will praise the guy that John$_i$ promoted.

       b.   The guy that John$_i$ promoted, he$_i$ will praise t.

(47)   A: Who will John praise? Will he praise his boss?

        B: ??No, the guy that John promoted. (OK: No, the guy that he promoted.)

- Weir 2014, 2015 therefore argues that, while fragments do undergo syntactic movement – to maintain facts like the P-stranding generalization – this movement is not interpreted. It takes place **only at PF syntax.**

- Assuming that Lebeaux effects are fundamentally LF issues concerning the application of the binding theory, we do not expect them to arise from PF-only movement.

- Similarly, moving NPIs out of the scope of their licensors will not be a problem if done only at PF: at LF, these items remain in the scope of their licensors.

(48)   What didn't John buy? — Any wine.

       a.   PF: [$_{CP}$ Any wine [$_{CP}$ [$_{TP}$ ~~John didn't buy t~~]]]

       b.   LF: [$_{CP}$ [$_{TP}$ John didn't buy any wine]]

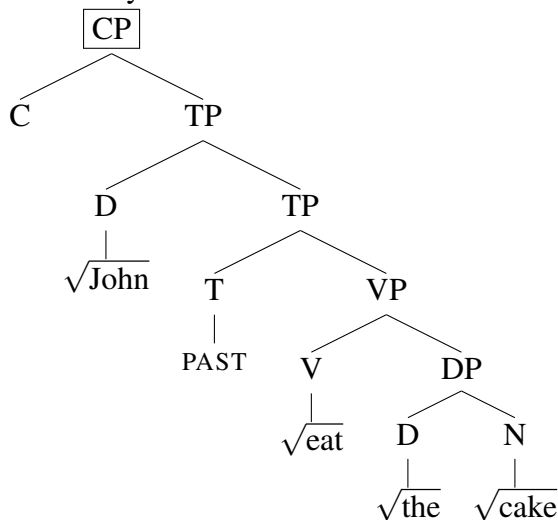## 3.3   Fragments at the syntax-prosody interface

- If the proposal in Weir 2014, 2015 that fragments move only at PF is correct, then it may be fruitful to extend the syntax-prosody interface model already developed for left-edge ellipsis to fragment answers.

- My proposal is that clausal ellipsis involves the **insertion of a null CP proform**[15] at the level of lexical insertion – i.e. at the syntax-phonology interface.

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[15]For current purposes, supposing a TP proform would work as well, but see Weir 2014:ch. 5 for arguments that what is elided in clausal ellipsis is bigger than TP.
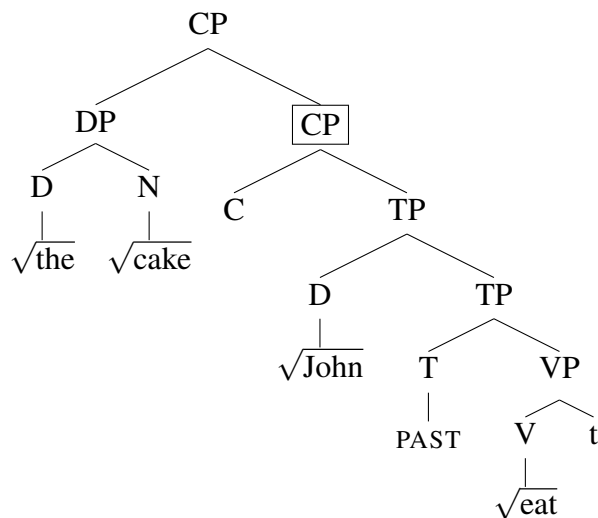
- If a CP meets particular **syntactic** and **semantic recoverability conditions**, it can be replaced by a null proform without violating the RECOVERABILITY constraint.

- I will not dwell on what the precise recoverability conditions here are. On the semantic side, the CP seems to have to be congruent in some way with the question-under-discussion or 'live issue' (Ginzburg & Sag 2000, Reich 2007, AnderBois 2010, Weir 2014, Barros 2014 a.o.) On the syntactic side, some sort of syntactic isomorphism with an antecedent seems to be necessary, even if the conditions on it are not fully understood (see e.g. Chung 2006, 2013, Merchant 2013).

- However, a focused phrase within an otherwise elidable CP has to be pronounced (obviously the deletion of a focused phrase, with new information, would lead to a violation of Recoverability).

- I propose that the way the grammar deals with this problem is to move a phrase bearing focus and adjoin it to CP. The resulting representation contains a CP which can be safely deleted (replaced with a null pro-form) without violating Recoverability (shown in a box below).

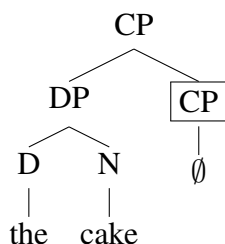(49)   What did John eat? — The cake.

(50)   a.   Narrow syntax:

         b.   PF-movement:

c. Lexical insertion:

```
                CP
              /    \
           DP      [CP]
          /  \       |
         D    N       ∅
         |    |
        the  cake
```

- Note that this is movement of a *syntactically* defined constituent – A′-movement – and it respects all the relevant constraints on movement.

- For example, in non-P-stranding languages, prepositions must be moved; left-branch adjectives can't be fragments; etc.

- Note further that the insertion of the null CP pro-form is a purely PF phenomenon. At narrow syntax (and at LF), all of the structure is there: i.e. the ellipsis here does not involve a (narrow-syntactic) structureless pro-form as in Lobeck 1995, nor an 'LF-copy' type model as in Chung et al. 1995.

3.4 Optionality of clausal ellipsis

- Insertion of a CP proform is only possible if the content would be Recoverable.

- The insertion of a null CP will also be penalized by MAX.

- We can usefully represent the optionality of clausal ellipsis, then, by making use of the same device as was used to represent the optionality of left-edge ellipsis: MAX is rerankable with respect to some constraint that *favors* the ellipsis of CP, which for the present I will simply call DELETE-CP.

- The tableaux below illustrate the derivation of two possible responses to the question in (51).

- The first is the full clausal answer, where MAX outranks DELETE-CP.

- The second is the fragment answer, where DELETE-CP outranks MAX.

(51)   What did John eat?
   a.   John ate the cake.
   b.   The cake.

(52)

[CP [TP DP [VP V DP]]]	RECOV	MAX	DELETE-CP
☞ a. [CP [TP [DP John] [VP [V ate] [DP the cake]]]] ($_\iota$ ($_\phi$ John) ($_\phi$ ate ($_\phi$ the cake)))			*
b. [CP [DP the cake] [CP ∅]] ($_\iota$ ($_\phi$ the cake))		*	

(53)

[CP [TP DP [VP V DP]]]	RECOV	DELETE-CP	MAX
a. [CP [TP [DP John] [VP [V ate] [DP the cake]]]] ($_\iota$ ($_\phi$ John) ($_\phi$ ate ($_\phi$ the cake)))		*	
☞ b. [CP [DP the cake] [CP ∅]] ($_\iota$ ($_\phi$ the cake))			*

3.5 Comments on PF movement

- The (syntactic) movement of the focused phrase (*the cake*) is taking place at the mapping between syntax and prosody. This is why this level of the model has to include a syntactic parse in the output: the input is the narrow syntax, where no movement takes place.

- The movement is forced because of the RECOVERABILITY constraint. Attempting to insert a CP proform for the whole CP (without first moving the focused phrase) will violate RECOVERABILITY.

- Attempting to do the ellipsis 'bit by bit' (which would leave the remnant in situ) will also run afoul of RECOVERABILITY, on the assumption that there is no lexical pro-form for e.g. lexical verbs (like *ate*).[16]

(54)

$[_{CP} [_{TP} DP [_{VP} V DP]]]$	RECOV	DELETE-CP	MAX
a. $[_{CP} [_{TP} [_{DP} John] [_{VP} [_V ate] [_{DP} the cake]]]]$ $(_\iota \quad (_\phi John) (_\phi \quad ate \quad (_\phi the cake)))$		*	
b. $[_{CP} [_{DP} the cake] [_{CP} \emptyset]]$ $(_\iota \quad (_\phi the cake) \qquad)$			*
c. $[_{CP} \emptyset]$ $(_\iota)$	*!		*
d. $[_{CP} [_{TP} [_{DP} \emptyset] [_{VP} [_V \emptyset] [_{DP} the cake]]]]$ $(_\iota \qquad\qquad (_\phi the cake))$	*!		*

- We might also worry that giving this level of syntax the ability to (syntactically) move constituents gives it too much power – constituents might be moved for merely prosodic reasons.

- Such movement for prosodic reasons is in fact countenanced for Irish pronoun postposing by Bennett et al. to appear.

- I suppose there is a constraint, high-ranked in English, that enforces the 'correct' linearization of syntactic structure in general, which I take from Bennett et al. to appear, with a small addition:

(55) NO SHIFT (my additions in bold)
If a terminal element α is linearly ordered before a terminal element β in the syntactic representation of an expression E, then the phonological exponent of α **if expressed** should precede the phonological exponent of β **if expressed** in the phonological representation of E.

- NO SHIFT will penalize 'gratuitous' PF movement in the general case, as in the candidate (56a).

- However, under ellipsis, linear order is *not* in fact violated. E.g. in (56b), *the cake* does not appear out of order wrt *John ate*, because *John ate* is not pronounced.

- So, under ellipsis only (in English), PF-movement that 'disrupts' linear order becomes possible. (Fox & Pesetsky 2005 make use of a similar idea, and cf. the literature on 'exceptional movement in ellipsis', e.g. Boone 2014.)

(56)

$[_{CP} [_{TP} DP [_{VP} V DP]]]$	NO SHIFT	RECOV	DELETE-CP	MAX
a. $[_{CP} [_{DP} the cake] [_{CP} [_{TP} [_{DP} John] [_{VP} [_V ate]]]]]$ $(_\iota \quad (_\phi the cake) \qquad (_\phi John) \quad (_\phi ate))$	*!		*	
b. $[_{CP} [_{DP} the cake] [_{CP} \emptyset]]$ $(_\iota \quad (_\phi the cake) \qquad)$			*	

---

[16]I haven't indicated this candidate as being penalized by DELETE-CP (even though the CP is not deleted as such), because this depends on how this constraint is understood – see next section.

3.6 What is DELETECP? – some speculations

- What is the nature of the constraint favoring ellipsis?

- At the moment, I have to leave this question open, and maintain the ad hoc constraint DELETE-CP.

- I do think it's plausible that the constraint involved is prosodic in nature: the constraint in question may be one that penalizes the number of phonological phrases in an output, something like Truckenbrodt 1999's *PPHRASE.

- Obviously eliding most of a clause will help reduce the number of phonological phrases in it:

(57)   What did John eat:
     a. $(_\phi$ John) $(_\phi$ ate $(_\phi$ the cake)).   (3 PPhrases)
     b. $(_\phi$ the cake)   (1 PPhrase)

This speculation is bolstered by the data below.

(58)   What will he do to the cake?
     a.   He will EAT the cake.
     b.   EAT it.
     c.   *EAT the cake.

(59)   What should he do with the flowers?
     a.   He should give the flowers to MARY.
     b.   Give them to MARY.
     c.   *Give the flowers to MARY.

- These questions can be answered with full clausal answers (a), and in such cases the Given DPs can be expressed in full.

- However, they can also be answered with VP fragment answers (b) – and if this is done, Given DPs within the fragment *must* be pronominalized. It is ungrammatical to express them as full DPs (c).

- If the constraint favoring ellipsis is one that penalizes the presence of phonological phrases, then this can be understood as favoring a representation like (60a) over one like (60b), where the full NP *the flowers* would be parsed into its own phonological phrase – by contrast, the pronoun is not (presumably cliticizing).

(60)   What should he do with the flowers?
     a. $(_\phi$ give them)$(_\phi$ to Mary)   (2 PPhrases)
     b. $(_\phi$ give $(_\phi$ the flowers)) $(_\phi$ to Mary)   (3 PPhrases)

- However, I have not yet been able to pin down exactly what constraint ranking predicts this.

- If the only constraints active were MAX and *PPHRASE, then (61a) below is predicted to harmonically bound (61b) – neither violate MAX, and (b) contains one more phonological phrase than (a).

- However, both outputs are in fact grammatical – we don't want (b) to be harmonically bounded.[17]

(61)

he should give the flowers to Mary	MAX	*PPHRASE
a. he should ($_\phi$ give them ($_\phi$ to Mary))		**
b. he should ($_\phi$ give ($_\phi$ the flowers) ($_\phi$ to Mary))		***!

- The idea that ellipsis is driven by a constraint penalizing prosodic structure is an attractive one, but the explication has to be left to future work – any suggestions are welcome.

---

4 The interaction between left-edge ellipsis and fragments

4.1 Fragments bleed left-edge ellipsis

- Left-edge ellipsis and fragments interact in a curious way.

- Namely, **the availability of a fragment appears to block left-edge ellipsis.**

- This is further support for locating both of these processes at the same 'level' of grammar.

Consider contrasts like the below.

(62)   [Out of the blue]
      a. ~~I~~ just gave some flowers to Mary.
      b. ~~I've~~ just made a very nice cake.
      c. ~~I'm~~ leaving at four.
      d. ~~I'm~~ going to the gym later.

(63)   What did you just give to Mary?
      a. I gave SOME FLOWERS to Mary.
      b. SOME FLOWERS.
      c. ??Gave SOME FLOWERS to Mary.

(64)   What have you made there?
      a. I've made A VERY NICE CAKE.
      b. A VERY NICE CAKE.
      c. ??Made A VERY NICE CAKE.

(65)   (from Zwicky & Pullum 1983:ex. (28), adapted)
    When are you leaving?
      a. At four.
      b. I'm leaving at four.
      c. ??Leaving at four.[18]

---

[17](b) would not be harmonically bounded if MAX penalized the realization of DPs as pronouns. But we don't want this – in the analysis given in section 2 of left-edge ellipsis, MAX crucially must penalize only silent exponents, not pronouns.

[18]Zwicky and Pullum actually mark this example with '*' (in this context); I agree that this is degraded but do not feel as strong an ungrammaticality as '*' implies.

(66)   Where are you going later?

        a.   I'm going to the GYM later.
        b.   To the GYM.
        c. ??Going to the GYM later.

- Left-edge ellipsis in sentences like these is grammatical as such in out-of-the-blue (broad focus) contexts, such as (62).

- However, in narrow focus contexts – where a fragment answer is available – left-edge ellipsis is degraded.

- This is more sharply obvious in cases like (67), (68), where the cleft structure forces narrow focus.

(67)   Who is it that I should talk to about this?

        a.   It's JOHN that you should talk to about this.
        b.   JOHN.
        c.   *JOHN that you should talk to about this.

(68)   What was it that you bought?

        a.   It was a copy of *Aspects* that I bought.
        b.   A copy of *Aspects*.
        c.   *A copy of *Aspects* that I bought.

- Deleting *it's* is of course possible under left-edge ellipsis as such (e.g. *Gonna start raining soon*)

- And it's possible to do left-edge ellipsis in the cleft-like structures in (69)– which are out-of-the-blue.[19]

(69)   a.   ~~That's a~~ nasty bruise that you've got there.
            b.   ~~It's~~ fine weather that we're having today.

- And note that forms like (67c), (68c) satisfy STRONGSTART.

- But it appears that the availability of a fragment, as in (67), (68), *bleeds* the possibility of left-edge ellipsis.

4.2 Modelling the interaction

- It is not very clear how this interaction could be handled if left-edge ellipsis were 'purely' prosodic but clausal ellipsis was not.

- By contrast, it is quite simple to capture this pattern if the constraints governing both fragment ellipsis and left-edge ellipsis are operative at the same level.

- We can stipulate that the constraint favoring fragment ellipsis, DELETE-CP, is rigidly ordered above STRONGSTART.

- MAX is freely rerankable – but if it's below STRONGSTART, then it's below DELETE-CP too.

---

[19]Thanks to Chris Wilder for pointing this kind of datum out.

- All-new sentences allow left-edge ellipsis if MAX is ranked below STRONGSTART. (Technically, such sentences incur violation of DELETE-CP, but deleting these CPs would result in fatal violations of Recoverability.)

(70)

[$_{CP}$ T$_i$ [$_{TP}$ D [$_{TP}$ t$_i$ [$_{VP}$ V DP]]]]		RECOV	DELETE-CP	STRST	MAX
a.	[$_{CP}$ [$_T$ Have] [$_{TP}$ [$_D$ you] [$_{VP}$ [$_V$ seen] [$_{DP}$ the film]]]] ($_\iota$ ($_\sigma$ have) ($_\sigma$ you) ($_\phi$ ($_\omega$ seen) ($_\phi$ the film)))			*	*!	
☞ b.	[$_{CP}$ [$_T$ ∅] [$_{TP}$ [$_D$ ∅] [$_{VP}$ [$_V$ seen] [$_{DP}$ the film]]]] ($_\iota$ ($_\phi$ ($_\omega$ seen) ($_\phi$ the film)))			*		**

Sentences in which a fragment is in principle possible – i.e. ones in which the CP can be deleted without violation of RECOVERABILITY – can be pronounced in totality if MAX is above DELETE-CP (the below sentence answers *Who is it I should talk to?*)...

(71)

It's John that you should talk to		RECOV	MAX	DELETE-CP	STRST
☞ a. It's John that you should talk to				*	*
b. John ~~it's t that you should talk to~~			*!		
c. ~~It's~~ John that you should talk to			*!	*	

...and a fragment can be produced if MAX is below DELETE-CP ...

(72)

It's John that you should talk to		RECOV	DELETE-CP	MAX	STRST
a. It's John that you should talk to			*!		*
☞ b. John ~~it's t that you should talk to~~				*	
c. ~~It's~~ John that you should talk to			*!	*	

...but if MAX is below STRONGSTART, then the result is *still* the fragment. The form with left-edge ellipsis is bounded by the form that deletes the entire root CP (except for the fragment).

(73)

It's John that you should talk to		RECOV	DELETE-CP	STRST	MAX
a. It's John that you should talk to			*!	*	
☞ b. John ~~it's t that you should talk to~~				*	*
c. ~~It's~~ John that you should talk to			*!		*

5 Ramifications and future work

Many questions remain:

- I have put aside here the question of formal recoverability of the null pro-forms involved. For the CP pro-forms, this is the question of what the identity condition in ellipsis is, which is very hotly debated. The recoverability of null DP pro-forms is no less so. I plan to return to this in development of this work.

- Another key unanswered question concerns the nature of the 'constraint favoring clausal ellipsis', as discussed above. It seems plausible that this constraint may be prosodic in nature, but this requires future work.

- If, however, clausal ellipsis *is* motivated by a prosodic constraint, then this raises questions about whether 'purely' syntactic mechanisms of ellipsis licensing – such as Merchant 2001's [E]-feature –

are required, or indeed even desirable. Can all the work be done by a combination of recoverability constraints on the use of pro-forms, combined with some (as yet mysterious) constraint at the syntax-phonology interface which motivates ellipsis? This is tempting, but things like cross-linguistic variation in ellipsis (e.g. the wider distribution of clausal ellipsis in Hungarian compared with English, van Craenenbroeck & Lipták 2006 a.o.) would need to be dealt with.

- Another area for development is how other forms of ellipsis fit into this picture, such as sluicing; if sluicing is also clausal ellipsis, is it also a PF-syntax interface phenomenon? What about VP ellipsis?

- Finally: the model I have proposed here requires a syntactic parse to be part of the *output* of the syntax-prosody mapping. We might wonder if we could do without that.

- The motivation for this is the apparent fact that fragments are sensitive to A′-movement conditions. Can this somehow be reduced to facts about *prosodic* constituency only? Bruening 2015 attacks this project, but it's not clear whether facts like the P-stranding and left-branch generalizations can be reduced to prosody – though maybe they can.

However, I hope to have established at least the following conclusions:

- left-edge ellipsis is prosodically-driven insertion of null lexical elements, at the syntax-prosody interface;

- fragment answer ellipsis is movement of a constituent, followed by insertion of a null CP proform, at that same interface;

- evidence for both of these processes taking place at the same layer of the grammar is given by the interactions between them.

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