

Possessor Extraction in English^o

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Abstract: I analyze possessor extraction (PE) in English, a restricted possibility in the colloquial language of some speakers. I argue that the complexities of this corner of English provide evidence for Cyclic Linearization (Fox & Pesetsky 2005, a.o.), which restricts English PE via its interaction with a PF condition on the Saxon genitive morpheme [*'s*] (Gavruseva & Thornton 2001) that possessor-extracting speakers can satisfy at the local phase level. These results imply the non-phasehood of DP, shed light on the derivation of *that's*-relatives, reveal some general linearization constraints on stranding, and indicate the origination of expletive *there* in vP.

1 Introduction

This paper examines a case of *possessor extraction* (PE), the A'-movement of a possessor from the possessed nominal phrase. For many English speakers, A'-movement of possessors requires pied-piping of the containing possessum, as in (1).

(1) **Standard English possessum pied-piping**

Mary is the author [_{CP} **whose new book**]_k they said [_{CP} ____k is good]]

Such pied-piping is often thought to be the only possibility for English. This view is challenged by examples like (2) below, which are the subject of this paper. In (2) we see an equivalent of (1) available in the colloquial language of some speakers, in which the possessor extracts, stranding the Saxon genitive morpheme [*'s*] as well as the rest of the possessum in an embedded clause. This initial English PE example is appropriately marked with ‘%’, as PE is not available to all speakers, but I omit this in subsequent examples.

(2) **PE in English**

% Mary is the author [_{CP} **who**]_k they said [_{CP} [____k **'s new book**] is good]]

In (2), [*'s*] becomes phonologically dependent on the verb *said* in the absence of the moved possessor. It is easy to see that this /s/ really must be a stranded Saxon genitive morpheme. The past tense and plural subject of the relative clause in (2) where PE is taking place eliminate the possibility of this /s/ being subject agreement. The fact that the possessor is female also removes any possibility of this being a reduced resumptive *his*.

While not all speakers accept such examples, many do as part of the informal spoken register. This informal status may contribute to its rarity in written form.¹ In the present

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¹English PE isn't absent in writing, however, as the following examples retrieved from the internet show:

study, a query of 34 speakers, mostly residents of the Boston area, resulted in 19 reporting PE to be grammatical.² Some such speakers are aware that they use the construction, while others are surprised to notice its acceptability when it is pointed out to them.

While PE has been well established in various languages³ like Hungarian (3), the possibility of PE in English has received little attention.

(3) **Hungarian PE** (Szabolcsi 1984)

ki-nek_k ismer-té-tek [a ____k vendég-é- \emptyset -t]
who-DAT know-PST-2PL [the guest-POSS-3SG-ACC]

‘Whose guest did you know?’ [Lit: ‘Whose did you know guest?’]

The only literature I know to have considered the existence of PE in English is Gavruseva & Thornton (2001), discussed in the next subsection.⁴ While I argue that English PE is true movement, its distribution is quite restricted, which plausibly has something to do with the fact that it has not been widely noticed. An analysis of these restrictions and their consequences for syntactic theory is the focus of this paper.

1.1 Background

The possibility of this sort of PE contrasts with the known impossibility of extracting *whose* (which I take to be *who* + [’s]), or any possessor marked with [’s] in English:

(4) **No extraction of *whose***

* Mary is the author [_{CP} **whose_k** they said [[____k **new book**] is good]]

If a possessor DP is the specifier of a possessive D whose exponent is [’s] in English (Corver 1992, Chomsky 1995, a.o.), the immobility of *whose* and elements like it is unsurprising,

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- i. a. She raised her eyebrows while her other brunette friend, **who I heard’s name** is Caroline...
 (<https://www.quotev.com/story/5110453/THE-GREAT-McCANN/23>)
 - b. ...the rizinosaurus, **who you said’s major downfall** would be it’s size...
 (<http://www.topix.com/forum/science/dinosaurs/TAIDJ8LEBGL3O0D5I/p2>)
 - c. So **who do you think’s car** it is.
 (<https://www.wattpad.com/133087986-stranger-c-d-2>)
 - d. Noelle has helped me in the past, along with another women **who I believe’s name** is Rosie.
 (https://www.dbchocolate.com/Hazelnut-Truffles_p_835.html)

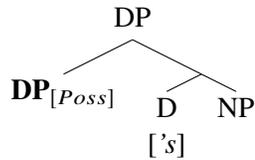
²My informants are mostly American, though the set of those who accept PE includes two Canadian, one Australian, and one British speaker. There is no clear generalization about the age/origin of PE speakers.

³In addition to the Finno-Ugric Hungarian, some other PE languages are Chamorro (Austronesian, Chung 1991), the Mayan languages Tzotzil (Aissen 1996) and Chol (Coon 2009), and much of Slavic (Bošković 2005, Ross 1967). Romance and Germanic have some PE of postnominal/PP possessors.

⁴The closest mention of the construction in other work that I am aware of (thanks to a reviewer’s comment) is Heck (2006), who in footnote 64 credits Andrew McIntyre for the observation of the sentence *a person who I thinks reputation would be better if they stopped dribbling incessantly*. Heck assumes that this sentence is formed by placing a parenthetical in DP, an analysis that the present paper argues against in section 3 below.

as this would be movement of a non-constituent. However, the specifier of [*'s*] is surely a phrase, which as such is in principle movable:

- (5) **A structure for possessive DPs headed by [*'s*] (where $DP_{[Poss]}$ = possessor)**



While this phrase can apparently be moved for some speakers as (2) showed, the marking ‘%’ on (2) reminds us that for many English speakers, such movement is not possible.

Various works attribute the typical illicitness of PE in English to conditions on PF (Phonological Form) that reject movement which separates a possessor from genitive morphology (Chomsky 1995, Radford 1997, Gavruseva 2000). Indeed, Gavruseva (2000) argues that such adjacency conditions play an important role in constraining PE cross-linguistically, banning PE in languages where they apply. In this paper, I will accept this general line of explanation for those English speakers who reject PE. However, I argue that the nature of PE in English does not indicate that speakers who permit PE lack such a constraint, but rather shows that such speakers can satisfy this requirement in a more flexible, local way. This account permits PE, but only in certain circumstances, as we’ll see.

Gavruseva & Thornton’s (2001) investigation of PE focused on long-distance *whose*-questions in child speech, where PE is quite frequent. Gavruseva & Thornton argue that PE is possible in child English because children have not yet acquired the PF constraints that require pied-piping, and consequently block PE. This perspective on the acquisition path leads us to expect a total lack of PE in a mature English grammar.

However, in a control study on adults reported in the same work, Gavruseva & Thornton (pg. 255) found PE in adult speech. 11% of their adult data comprises PE of the form shown in (2) above.⁵ Gavruseva & Thornton suggest that this 11% is the result of production errors. However, almost all such instances of PE gathered in this adult study were from two speakers, Cristy and Kath. Cristy produced PE about half as often as pied-piping, while Kath produced PE even more often. These speakers appear to have PE as a productive option. Indeed, in this work I claim that PE is a reality for some English speakers, though subject to restrictions, several of which Gavruseva & Thornton also identified. The explanation of these constraints, and their significance, comprises the core of this paper.

1.2 Results in preview

I argue that English PE obeys the following generalization, which subsumes an array of restrictions on this construction that will be laid out in the next section:

⁵A very small percentage of their data is comprised of other unusual extraction configurations (for instance, movement of *whose*) which I take to be genuine errors.

(6) **CP edge generalization on English PE**

A possessor must reach the left linear edge of the local CP before extracting from the possessum DP

A particularly clear instantiation of this generalization is evident with PE from non-subjects, exemplified in (7). We see here that PE from an object possessum is unacceptable if this possessum is stranded in its base position (7a). Rather, the possessum must be displaced to the edge of the local CP (7b).

(7) **Displacement of non-subject possessum under PE**

- a. * **Who**_k do they think [_{CP} Mary read [_{__}_k's **book**]]?
- b. ✓ **Who**_k do they think [_{CP} [_{__}_k's **book**]_j Mary read *t*_j]

1.2.1 The governing factors: Cyclic Linearization and ['s] adjacency

I argue that the generalization in (6), which describes (7) and related restrictions, derives from two concepts—the Cyclic Linearization (CL) theory of spellout (Fox & Pesetsky 2005a/b, Podobryaev 2007, Sabbagh 2007, Fanselow & Lenertová 2011, Ko 2011, 2014) and an adjacency requirement on ['s] and the possessor (Gavruseva 2000, Gavruseva & Thornton 2001). As mentioned, Gavruseva (2000) argues that PF conditions on genitive morphology restrict PE in some languages. I argue that while English speakers that reject PE enforce adjacency between possessor and ['s] absolutely, speakers who permit PE have the option of satisfying this requirement locally, as stated in (8):

(8) **Possessor-Genitive Adjacency (Local version, available to PE speakers)**

['s] must be adjacent to its associated possessor at the spellout of the minimal phase (vP, CP) containing ['s].

I argue that (8) derives restricted PE of the sort described by (6) through its interaction with CL. According to CL, successive-cyclic movement (and certain exceptions to it) is motivated by the information-preserving nature of spellout—*Order Preservation*. This property of spellout only allows syntactic derivations which do not generate contradictory linearization statements, thus motivating successive-cyclicality and related effects.

The power of CL in predicting the details of English PE, a restricted and apparently infrequent construction, provides evidence for something like CL as an aspect of UG. Under this account, CL is a part of the grammar of both speakers who permit PE and those who don't. The difference between these two groups lies in how they enforce a PF condition. This understanding maintains a uniform syntax, with variation attributed to the PF interface.

1.3 Roadmap

Section 2 describes the facts about English PE, which section 3 argues is true extraction. Section 4 introduces the concepts used in section 5 to build an account of this phenomenon.

Section 6 discusses the account's general consequences for syntactic theory, namely, the veracity of the Cyclic Linearization approach, and the non-phasehood of DP. Section 7 extends this account to a novel analysis of *that's*-relatives (Seppänen 1995, McDaniel et al 1998, 2002), which supports Deal's (2016) claim that TP is a phase in relative clauses. Section 8 examines some predicted constraints on stranding in phase edges, leading to an argument that expletive *there* originates in vP (Biberauer & Richards 2005, Deal 2009).

2 The basic facts and puzzles

Here I describe the facts about English PE. This involves some preliminary analysis, leading to a generalization (6) that the core of this paper is concerned with deriving.

Gavruseva & Thornton's study of PE in child speech focused on questions, but English PE is possible in any A'-movement context, as (9) shows:

- (9)
- a. **Question**
Who_k do you think [[___k's hat] is the biggest]?
 - b. **Embedded question**
I can't remember [who_k I said [[___k's friend] is coming over]]
 - c. **Relative clause**
This is the student [who_k you suspect [[___k's answers] were copied]]
 - d. **Free relative**
I'll speak to [who_kever you suggest [[___k's idea] is the best]]
 - e. **Cleft**
It's Michelle [who_k we heard [[___k's cat] is the cutest]]
 - f. **Topic/focus movement**
John may be boring, but let me tell you about Jim. **This guy**_k, I think [[___k's story] will intrigue you]

Most of the above examples show extraction of *who*. Other possessors can extract too, as in (10), though extraction of larger possessors tends to be judged as more difficult.⁶ For clarity of judgments, many of the PE sentences that I use in this paper extract *who*.

(10) Extraction of other possessors

- a. [Which student]_k did he claim [[___k's idea] was stolen]?
- b. [How many people]_k do you think [[___k's books] are on the table]?
- c. I went to the place [which]_k she said [[___k's pastries] are tastiest]]⁷

⁶Gavruseva (2000) points out that the sorts of *wh*-phrases capable of PE in a given language are subject to some idiosyncrasy, and it may prove to be the case that this is true of English too.

⁷The possibility of examples like (10c) is interesting in light of the fact that *which* is not usable with [_s] in non-extraction circumstances (**which's*). Whatever the source of this unacceptability is, it is apparently ameliorated by movement. I suspect the same is true for other typically bad *wh*-possessors (**where's* / **what's* / **when's*). The source of this effect will have to wait for other work.

Further examination quickly reveals a number of puzzles. First, notice that all of the English PE examples shown so far have been multi-clausal. This is not a coincidence. As (11) shows, English PE within a single clause is not possible:

(11) **No PE in monoclausal derivations**

- a. * **Who**_k did you meet [_k's friend] yesterday?
- b. * **Who**_k should [_k's article] cause a big controversy?
- c. * John is the one [**who**_k you stole [_k's pie]]

Additionally, most of the English PE examples presented so far show PE from a subject. As previewed in (7) above, non-subject⁸ possessum DPs exited by PE must be displaced to the edge of the local CP. Not doing so is unacceptable, as (12) shows again:

(12) **Displacement of non-subject possessum under PE**

- a. * **Who**_k do they think [_{CP} Sue found [_k's kid]]?
- b. ✓ **Who**_k do they think [_{CP} [_k's kid]_j Sue found _j]
- c. * Mary is the person [**who**_j I heard [_{CP} John ate [_j's food]]]
- d. ✓ Mary is the person [**who**_j I heard [_{CP} [_j's food]_k John ate _k]]
- e. * Tell me [**who**_j they said [_{CP} we should meet [_j's friend]]]
- f. ✓ Tell me [**who**_j they said [_{CP} [_j's friend]_k we should meet _k]]

Example (12) demonstrates the necessity of this displacement with an object possessum, but as (13-15) below show, the same applies for non-subject possessum DPs in general. Leaving the possessum in its base position is impossible for all of these scenarios.

(13) **PE from direct object**

- a. **Who**_j do they think [[_j's book]_k we should give Mary _k]
- b. **Who**_j do they think [[_j's book]_k we should give _k to Mary]

(14) **PE from indirect object⁹**

- a. **Who**_j do they think [[_j's cat]_k we should give _k the prize]?
- b. **Who**_j do they think [[_j's cat]_k we should give the prize [to _k]]?

This contrast also applies to expletive associates, which are post-verbal by default, though under PE they must end up at the edge of CP, as in (15c). Such examples are marked, but they clearly improve on alternatives like (15b).¹⁰

⁸I use 'non-subject' to refer to all DPs whose base position prior to A'-movement is not spec-TP, but a lower, post-verbal position. Thus this set also includes, for instance, expletive associates.

⁹Though leftward A'-movement of the IO here is independently ruled out for some speakers.

¹⁰A reviewer notes that the degradation of this example may be due to the fact that the nature of the possessor interacts with the availability of being a *there*-associate, and *who* is not independently good as a *there*-associate (ii). As far as I can tell this is true of *wh*-phrases generally, meaning that examples like (15c) likely cannot be constructed without some degradation.

ii. Which teacher said there is a student/*who in the room?

(15) **PE from expletive associate**

- a. Mary said [there were [someone's books] on the table]
- b. * **Who_j** did Mary say [there were [___j's books] on the table]?
- c. ? **Who_j** did Mary say [[___j's books]_k there were *t_k* on the table]?

Gavruseva & Thornton noticed the obligatory displacement of non-subject possessum DPs under PE (specifically for objects) in their study as well, in both children and adults. They suggest that this is derived by the possessor's movement pied-piping the possessum to the edge of the embedded CP, and then stranding it there by subsequent extraction. If this is correct (as the appendix explicitly argues)¹¹, then such stranding provides overt evidence that movement from CPs successive-cyclically passes through their edge, joining arguments in previous literature on Afrikaans (Du Plessis 1977), mainstream English (Urban 1999), West Ulster English (McCloskey 2000, Henry 2012), and Polish (Wiland 2010). Those works show elements that are strandable in an intermediate CP edge, as well as in their base position. I have just shown, however, that non-subject possessum DPs in English cannot be stranded in their base position by PE. This fact presents a puzzle which suggests that the state of affairs here is more complex than the usual cases of stranding.

2.1 The possessor extracts from DP via the linear edge of CP

We've seen that PE from non-subject possessum DPs requires pied-piping the possessum to the edge of the local CP. At first glance, such facts suggest that PE is only possible from the structurally highest DP in the clause. Before A'-movements, the structurally highest DP is whatever ends up in spec-TP. If the DP exited by PE is not in spec-TP, it consequently must be pied-piped to spec-CP with the moving possessor prior to PE. This description is consistent with what has been shown so far.

If this were a sufficient description, however, PE of post-nominal possessors from a possessed subject should be grammatical. In reality, such examples are not accepted:

(16) **No PE of post-nominal possessors**¹²

- a. * **Who_k** did you say [_{CP} [**a cookie recipe of** ___k's] is getting popular]?
- b. * That's the senator [**who_k** they think [_{CP} [**a friend of** ___k's] got a huge bribe]]

We have already seen examples of PE from subjects, so there is no benefit to attributing the deviance of these examples to the known difficulty of extracting from a subject.

Notice that in the sentences of (16), the overt material within the possessum intervenes between the trace of PE at the right side of DP, and the left edge of the local CP. This observation suggests the following generalization, which I'll show is correct:

¹¹Specifically, the appendix argues that this displacement is not caused by topic/focus movement.

¹²These examples improve if ['s] is absent (to the extent that extraction from indefinite subjects is tolerable), indicating that this morpheme's requirements are influential in constraining PE, as this paper argues.

- (17) **CP edge generalization on English PE** [= (6)]
 A possessor must reach the left linear edge of the local CP before extracting from the possessum DP

This generalization is graphically depicted below:

- (18) $[_{CP2} DP_{[Poss]} \dots [_{CP1} (*\alpha) [_{DP} (*\alpha) \text{---}'s NP] \dots]]$
-

Since the overt material in DP intervenes between the linear edge of CP and the trace of PE in (16), this PE of a post-nominal possessor is expected to be bad, given (17). Further facts which the following subsections show have the same explanation. Notice that this generalization is consistent with the pied-piping of non-subject possessum DPs under PE (12-14)—without pied-piping to the CP edge prior to PE, (17) would not be met.

This generalization also clarifies the apparent impossibility of PE in mono-clausal sentences (11). If (17) holds, PE cannot become evident unless at least one CP is crossed by movement of the possessor.

2.1.1 Preposition stranding and PE

PE is not possible from a DP inside a PP, unless P is stranded in its base position:

- (19) **Pied-piped P blocks PE**
- Who_j do they think [[_j's house]_k we should leave **from** _k]?
 - * Who_j do they think [[**from** _j's house]_k we should leave _k]?
 - Who_j did they say [[_j's cat]_k we should give the prize **to** _k]?
 - * Who_j did they say [[**to** _j's cat]_k we should give the prize _k]?

As with other non-subject DPs, the DPs in (19) must be pied-piped to the edge of the local CP to permit PE. These DPs originated inside of PPs, and even though P is usually able to be pied-piped along with its DP complement under A'-movement in English, in this context only P-stranding is permitted. This is what we expect given the generalization in (17). If P had been pied-piped to spec-CP along with the possessum, this P would illegally intervene between the left edge of the clause and the trace of PE in DP.

2.1.2 Complementizers and PE

The distribution of complementizers and adverbs in PE derivations also fits the linear generalization in (17). Recall that in English, long-distance *wh*-movement of non-subject DPs is compatible with an overt C (*that*) in the embedded clause:

- (20) **Overt C with non-subject extraction**
 Who_j do they think [_{CP} (**that**) Mary likes _j]?

Subject extraction, however, is not compatible with an overt C, a phenomenon well-known as the *that*-trace effect:

(21) **The *that*-trace effect**¹³

Who_k do they think [_{CP} (***that**) ____k likes Mary]?

PE from a subject is also incompatible with an overt C. This fact is interesting because here we have extraction out of, but not (cross-clausal) movement of, the subject. Thus this fact does not necessarily constitute an instance of the *that*-trace effect.¹⁴

(22) **No overt C with PE from subject**

- a. Who_k do they think [**(*that)** [____k's name] is Mary]?
- b. Who_k did you suspect [**(*that)** [____k's notebook] was stolen]?

Notice that in (22), the presence of an overt C to the left of the possessum subject means that the trace of PE within this DP is not adjacent to the left linear edge of CP. Thus (17) is not met here, and ungrammaticality is expected.

PE from (obligatorily pied-piped) non-subject DPs is also incompatible with an overt C. If the possessum in such scenarios is stranded in spec-CP as discussed above, C should not be able to precede it anyway. An overt C to the right of the stranded DP is also not possible, which I attribute to the Doubly-Filled Comp Filter (Chomsky & Lasnik 1977).

(23) **No overt C with PE out of a pied-piped non-subject possessum**

- a. Who_j did you say [**(*that)** [____j's cat]_k (***that**) John saw ____k]?
- b. Who_j does he think [**(*that)** [____j's cat]_k (***that**) he wants to take home ____k]?

2.1.3 Adverbs and PE

High adverbs are possible on either side of the English subject:

(24) **Variable high adverb position**

- a. (Fortunately) John (fortunately) has money.
- b. (Usually) Mary (usually) eats a burrito for lunch.

PE from a subject is incompatible with such an adverb to the left of that subject, but is possible with the adverb to its right:

(25) **No adverb preceding subject exited by PE**

Who_k did you say [**(*usually/*fortunately)** [____k's friend] (usually/fortunately) has money]?

¹³At least in mainstream English, since as a reviewer points out, there are other English varieties that allow what would incur a *that*-trace violation in standard English (Sobin 1987).

¹⁴This fact is compatible with accounts of the *that*-trace effect as a linear filter on an overt C adjacent to a trace (Bresnan 1972, Chomsky & Lasnik 1977). I do not aim to say anything about complementizer-trace effects in this paper, as the account of English PE presented here ultimately predicts (22) anyway.

This unacceptability is expected if (17) holds, since an adverb to the left of the subject possessum DP linearly intervenes between the trace of PE in DP and the edge of CP. PE from a non-subject, necessarily involving pied-piping as already shown, behaves the same:

(26) **No adverb preceding non-subject exited by PE**

Who_j did you say [**(*allegedly/*fortunately)** [___j's cat]_k (allegedly/fortunately)
John found ___k]?

2.2 The puzzle

I've shown that English PE is subject to the generalization in (17), which prevents any material from intervening between the trace of PE within DP, and the left linear edge of the local CP. As previewed, I will argue that this generalization emerges from two concepts: The pressures of CL, and an adjacency condition on ['s] that PE speakers can satisfy at a local (phase-bounded) level of the derivation.

2.2.1 Against a discriminating ['s]

Some of the unacceptable examples of English PE seen in this section look superficially like they might relate to cliticization requirements of ['s]. However, there turns out to be no clear way to state what such requirements would be. Evidently ['s] can attach to lexical nouns, as in the basic non-PE cases, and verbs (2, and many more), but not adverbs (25, 26), or functional heads like P (16, 19) or C (22, 23).¹⁵ These facts do not yield an obvious generalization about what ['s] may attach to in PE derivations.

It is also not obvious why ['s] would be discriminating in PE contexts, even though it isn't selective generally, and can cliticize to adverbs and functional heads (Zwicky 1987):

- (27) a. [The person you're talking **to**]'s jacket
b. [The man who left **yesterday**]'s book

It would also remain puzzling that ['s] can cliticize onto verbs in some PE contexts, but not in those like (7a) where an object possessum is stranded in its base position.

Given these issues, I account for the facts about English PE without positing such selectional restrictions on ['s]. With this hypothesis put aside, in the next section I make the case that PE is true movement, setting the stage for the core analysis previewed above.

¹⁵PE in ditransitives can also yield strings where ['s] is adjacent to a pronoun. A lexical noun in the same position is less acceptable, but I suspect there is a garden path effect here.

iii. Who_k did they tell **me/you**? **your friend** [[___k's name] is Bill?

3 English PE is true extraction

One might question whether English PE truly involves movement. Here I present some arguments that a movement analysis is correct.

Recall that English PE only occurs in long-distance A'-movement contexts, unlike PE in languages like Hungarian. This fact might be thought to show that English PE is an illusion created by a DP-internal parenthetical clause, between the possessor and ['s]. This parenthetical would make the resulting construction always appear multi-clausal, since the DP-internal parenthetical ends us up with an additional verb in the surface string. For instance, the initial PE example in (2) could be true extraction in a bi-clausal context (28a), or a single clause with a parenthetical *they said* in the possessed DP (28b):

(28) **String:** *Mary is the author who they said's new book is good*

a. **Extraction analysis**

Mary is the author [_{CP2} who_k they said [_{CP1} [_{DP} ____k's new book] is good]]

b. **Parenthetical analysis**

Mary is the author [_{CP} [_{DP} who (**they said**)'s new book] is good]

As (29) shows, parentheticals are not independently attested in this DP-internal position, weakening the parenthetical analysis of PE:

(29) **Parentheticals are not permitted between DP_[Poss] and ['s]**

a. [_{DP} John (***I think/*of course**)'s idea] is funny

b. [_{DP} A friend of the teacher (***Mary said/*in fact**)'s] came over yesterday

Even if this argument were not conclusive on its own, a variety of other lines of evidence show that the parenthetical analysis of English PE is inadequate.

3.1 Failures of parenthetical subtraction

Parentheticals are optionally inserted into what are otherwise well-formed sentences. Therefore if PE constructions in fact involve parentheticals, we should get a well-formed sentence after subtracting the content that is supposedly parenthetical. This test reveals numerous PE derivations that cannot have been derived by parentheticals.

Consider the PE question in (30). Subtraction of the supposed parenthetical here yields an impossible string, whether or not the auxiliary *do* is counted as part of the parenthetical:¹⁶

(30) **Failed parenthetical subtraction:** *Who do they think's cat he saw?*

a. Who **do they think**'s cat he saw? → * Whose cat he saw?

¹⁶Thought it ought to be counted, as the auxiliary is required for a parenthetical in a matrix question:

iv. Whose book, (**do you think / *you think**), did Mary buy?

- b. Who do **they think**'s cat he saw? → * Who do's cat he saw?

Similar facts can be observed when we consider the phenomenon of 'Free Deletion in Comp' (Chomsky & Lasnik 1977), which can derive examples like (31), where the *wh*-operator in a relative clause may be silent:

(31) **Null relativization**

- a. The person [(who/∅)_k I like ____k] b. The cat [(which/∅)_k I saw ____k]

Comparable PE sentences with no overt *wh*-phrase are possible.¹⁷ However, removal of the supposed parenthetical material here does not yield an acceptable result:¹⁸

(32) **Null relativization in PE**

- a. The person [∅_{WHk} **I said** [[____k's cat] is cute]]
→ * The person['s cat is cute]
- b. The person [∅_{WHk} **I said** [[____k's cat]_j you saw ____j]]
→ * The person['s cat you saw]
- c. The person [∅_{WHk} **I think** [[____k's friend]_j you talked to ____j]]
→ * The person['s friend you talked to]

A similar effect is apparent with adjunct control. Example (33) below takes a PE sentence in which the subject of the supposed parenthetical controls into a *before* adjunct. Removal of the supposed parenthetical yields a bad result, where PRO is un-controlled:

(33) **Adjunct control with PE**

- Which author **did you**_k **say** [[___'s book] looked good] [before **PRO**_k ordering it]?
→ * Which author's book looked good [before **PRO**_{??} ordering it]?

Given that parenthetical subtraction fails in these PE examples, I argue that they cannot have been derived by insertion of a parenthetical.

¹⁷These PE examples with a null relative pronoun pattern exactly the same as PE with an overt *wh*-pronoun, including, as we see in (32b/c), the property of pied-piping non-subjects to the edge of the local CP. The present paper attributes this pied-piping to the interaction of CL and an adjacency constraint on ['s] and the possessor, but we might have expected these factors to be inapplicable when the possessor is covert. There are a few ways of understanding this. One option is that the possessor was originally overt before deletion applied to it. Another option is that the promotion analysis of relative clauses is right, in which case the head itself underwent movement rather than a separate operator. Yet another option is that covert material is subject to linearization. This is natural under an approach like Arregi & Nevins (2012) in which linearization applies before phonological form is assigned—under such a system, linearization cannot know to only apply to phonologically expressed material, since phonological form is not assigned until linearization has already taken place. That covert phrases are ordered is also required for Fox & Nissenbaum's (1999) account of extraposition, which involves late merge to a DP that has undergone linearly rightward covert movement.

¹⁸Though the post-subtraction strings in (32) are acceptable on an irrelevant structurally distinct parse.

3.2 PE is blocked by non-bridge verbs

If English PE is an illusion caused by a DP-internal parenthetical, we expect the same set of verbs that are good in parentheticals to be possible in forming these misleading sentences. This is not the case. Consider *whisper*, which is productive in parenthetical clauses:

(34) **Productive parenthetical *whisper***

Mary (John **whispered**) wants (John **whispered**) a kitten (John **whispered**)

This verb is among the manner of speech verbs (*mutter, stammer, mumble, groan*) that are non-‘bridge’ verbs, whose complements are not transparent for extraction, though these verbs are fine in parentheticals (Zwicky 1971, p. 255). As (35) shows, pied-piping possessor movement from the complement of such a verb is no good (35a). An equivalent PE configuration is no better (35b):

(35) **No extraction from complement of non-bridge verbs**

a. **Pied-piping possessor movement**

The person [[whose cat]_k I thought/said/***whispered**/***groaned** [____k was cute]]

b. **PE**

The person [who_k I thought/said/***whispered**/***groaned** [____k's cat] was cute]

In contrast, verbs with transparent complements (*think, say, claim, prove, suspect, tell, believe, hear, etc.*) are generally fine with PE, as we've seen throughout this paper.

3.3 PE is blocked by islands

Finally, placing an island boundary between the extracted possessor and [’s] results in unacceptability, as expected if this construction involves genuine sub-extraction. For more on islands see the appendix, which shows that PE is sensitive to weak islands as well.

(36) **Adjunct island**

a. * Who_k did you go home [because I said [[____k's friend] is ugly]]?

b. * [Which kid]_k did you leave class [before I said [[____k's shoes] are ugly]]?

(37) **Complex NP constraint**

a. * Who_k did you hear [the rumor that they said [[____k's friend] should be hired]]?

b. * [Which teacher]_k do you know a student [that said [[____k's class] is hard]]?

(38) **Coordinate structure constraint**

a. * Who_k did [she say [[____k's friend] is nice]], and [he say [Bill is mean]]?

b. ✓ Who_k did [she say [[____k's friend] is nice]], and [he say [[____k's friend] is mean]]?

Overall, the facts presented in this section indicate that these PE examples involve true movement, and not a parenthetical construction.¹⁹

4 The two mechanisms that constrain English PE

As previewed, I argue that the restricted distribution of English PE is predicted by the interaction of CL, and an adjacency requirement on ['s] that PE speakers can satisfy locally. This section explains these concepts, which are applied in the next section.

4.1 Cyclic Linearization (CL)

Chomsky (2000, 2001, inter alia) argues that phrasal movement must successive-cyclically pass through the edge (= specifier) of certain constituents termed *phases* (including at least vP and CP). In this theory, the edge is an escape hatch because it is not subject to phase-level spellout, which targets only the phase head's complement. After spellout, the complement is impenetrable to further syntactic operations. Thus material moving out of the complement must get to the edge of the phase before spellout applies, otherwise it will be trapped in the complement, and unavailable for further movement.

In contrast, Fox & Pesetsky (2005a/b a.o.) argue that spellout applies to entire phasal constituents, edges included. Phases spell out as soon as they are done being built up by successive applications of Merge. This hypothesis requires that spellout does not make constituents impenetrable, because in this system, all movement from a phase is of material that has undergone spellout within that phase. As such, successive-cyclic movement through phase edges does not occur because edges are exempt from phase-level spellout. Rather, Fox & Pesetsky argue that successive-cyclic movement through the edge is motivated by the information-preserving nature of spellout, *Order Preservation*:

- (39) **Order Preservation** (Fox & Pesetsky 2005a, pp. 6)
Information about linearization, once established at the end of a given Spell-Out domain, is never deleted in the course of a derivation.

If Order Preservation holds, it is not possible to revise established ordering information to save derivations that end up with a contradictory linearization. Therefore syntax must be able to derive configurations that end up with linearization information that is consistent across all phases in a given derivation, because if it does not, there will be a crash at PF. Fox & Pesetsky argue that exiting a phase by moving out via its linear edge is one way to keep linearization consistent for a derivation:

¹⁹If possessors really can be extracted from the possessum by A'-movement, we might expect, contrary to fact, that PE speakers are capable of possessor raising via A-movement. I suggest that since possessors are Case-licensed DP-internally, A-movement from DP is not an option, as English lacks hyper-raising.

v. *John_k was washed [____k's hands]

(40) **Successive-cyclic movement through linear edge of the phase**

$$\text{a. } \checkmark [ZP \alpha \underbrace{[PhaseP \alpha \beta [XP \alpha]]}] \quad \text{b. } * [ZP \alpha \underbrace{[PhaseP \beta [XP \alpha]]}]$$

By exiting via the linear edge of each phase passed, phase-exiting phrases are determined by PF to precede the content of each phase in question. This is ultimately consistent with a final representation where the moved material precedes all phases that it has exited.

If a movement from a phase doesn't pass through that phase's linear edge, hence crossing over some material in the phase on the way out, there is a way to salvage the derivation: Moving that crossed-over material into the next phase to a position preceding what crossed it, thus restoring their original order, keeps linearization coherent. For instance, (41a) below is bad if it remains as-is due to α non-successive-cyclically crossing over β on the way out of the phase. However, the derivation won't fail if, as (41b) shows, β later moves to precede α within the next phase as it did in the first:

(41) **Repairing a potential linearization problem**

$$\text{a. } * [YP \alpha \underbrace{[PhaseP \beta [XP \alpha]]}] \rightarrow \text{b. } \checkmark [YP \beta \alpha \underbrace{[PhaseP \beta [XP t_\alpha]]}]$$

This schema is the essence of Fox & Pesetsky's account of Holmberg's Generalization.

In what follows, we will see that pressure to obey the scenarios in (40) and (41) restricts PE by interacting with the previewed adjacency condition on [*'s*], discussed further below.

4.2 Phase-bounded adjacency and [*'s*]

Gavrusseva (2000) argues that PF conditions which mandate adjacency between genitive morphology and possessors partly determine whether a given language permits PE. Gavrusseva & Thornton (2001) make use of an English-particular instantiation of this general constraint, the essence of which I state as follows:

(42) **Possessor-Genitive Adjacency (Strong version)**

For any derivation containing [*'s*], [*'s*] must be linearly adjacent²⁰ to its associated possessor at the final PF representation of that derivation.

This constraint is phrased in such a way that it must be satisfied by the final representation generated by the derivation in question. Such a constraint predicts that PE should be impossible, as is indeed the case for many English speakers.

Of course, it is necessary to say something else about the grammar of those speakers who permit PE. I argue that (constrained) PE is an option for such speakers because they are able to satisfy the above condition more locally. In particular, I argue that such speakers can enforce this condition in a phase-bounded way, as described in (43):

²⁰I define adjacency as a relation between two elements α and β , whereby α and β form a linear string with nothing intervening between them. This notion of adjacency is not a primitive of CL, which is concerned only with relative order, for which intervening material is irrelevant. I suggest that adjacency of this sort is enforced by the PF requirements of certain elements, intuitively what we call "bound morphemes".

- (43) **Possessor-Genitive Adjacency (Local version)** [= (8)]
 ['s] must be adjacent to its associated possessor at the spellout of the minimal phase (vP, CP) containing ['s].

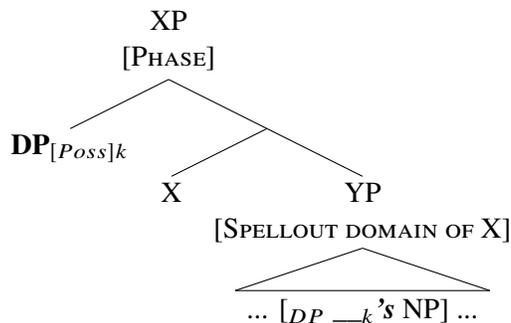
As we'll see, after satisfaction of this locally-evaluated condition, subsequent movement operations can break adjacency between the possessor and ['s]. Precisely because ['s] is not carried along into subsequent phases after successful PE, the adjacency condition is not applicable to those later phases, and the possessor can move on freely. For more discussion about the nature of this constraint, see section 9.1 and footnotes within.

4.3 The importance of spelling out phase edges

The fact that the CL theory includes phase edges in the spellout domain of a phase is crucial for the account of English PE. This system allows phase-level spellout and the PF adjacency requirement of ['s] in (43) to interact with successive-cyclic movement through phase edges. As we'll see, this interaction results in satisfaction of the requirement of ['s] only under particular circumstances, as desired.

This crucial interaction is not possible for Chomsky (2000, 2001), for which phase-level spellout is limited to phase complements. To see why, consider that in a PE derivation, successive-cyclic A'-movement brings the possessor to the edge of each phase being exited. In order for PE to actually occur, there will necessarily be a point in the derivation where the possessum is stranded in the spellout domain (complement) of a phase to whose edge the possessor has extracted. In such a configuration, as schematized in (44), the extracted possessor and the possessum are separated by a spellout domain (here YP):

- (44) **Possessor and ['s] separated by a spellout domain**



When spellout applies to YP in (44), the local adjacency requirement of ['s] is not met. This is because the extracted possessor has moved outside of the spellout domain YP of this phase XP, before spellout applied to YP. Thus spellout of YP finds ['s] non-adjacent to the possessor, and this derivation fails. This failure can be avoided if instead of PE, the possessum is pied-piped along with movement of the possessor. However, in doing this, PE fails to occur. This issue arises at any point where a spellout domain would separate the

possessor and possessum, leading this theory of phases to ultimately predict a total lack of PE, contrary to the facts presented in this paper.²¹

5 Predicting the facts

Now I will show how the concepts explained above predict the details of PE in English, which as we've seen, obeys the following generalization:

- (45) **CP edge generalization on English PE** [= (6)]
 A possessor must reach the left linear edge of the local CP before extracting from the possessum DP.

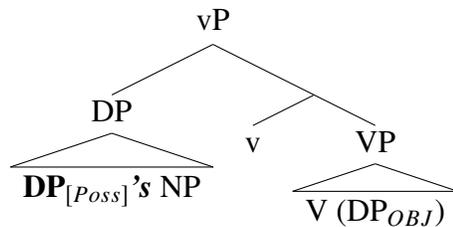
First I discuss PE out of subjects, followed by the more complex case of PE from non-subjects. I take all vPs to be phasal following Legate (2003), Ko (2014), and references therein, a claim which will also be relevant to the discussion of expletives later on.

5.1 PE from subjects

5.1.1 PE from subjects: The embedded vP level

First, consider PE from an external argument. If external arguments originate in spec-vP, as in unergatives and transitives, no successive-cyclic movement is necessary at this stage of the derivation. The in situ subject and its possessor are already at the linear edge of vP, which they will soon exit.

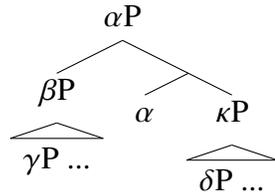
- (46) **Transitive/unergative vP**



Further, if movement of a phrase to the specifier of a head requires a probing feature on that head to find that phrase in its c-command domain (Chomsky 1995, 2001), then phrase-bounded specifier to specifier movement is not possible (Ko 2014). This is because a head does not c-command, and therefore cannot move, any of its specifiers or anything inside them. This is illustrated by the schema in (47), where we see that the head α c-commands its complement κ P and all that it contains, but not its specifier β P or any content thereof:

²¹A reviewer notes that one might defend the phase theory of Chomsky here by saying that if X in (44) is null (like a null C), the adjacency requirement would be satisfied upon the spellout of the next phase. The reviewer however points out that this idea could only apply in circumstances where PE is string-vacuous, and since non-string vacuous PE does occur, such an approach does not get the right results.

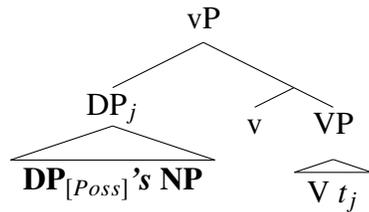
(47) **Heads don't c-command their specifiers and can't target them for movement**



Thus for instance, movement of βP or γP to a higher specifier of αP isn't possible. In the same way, extraction of the possessor in (46) to a higher specifier of vP is not only unnecessary as far as CL is concerned, but impossible anyway.

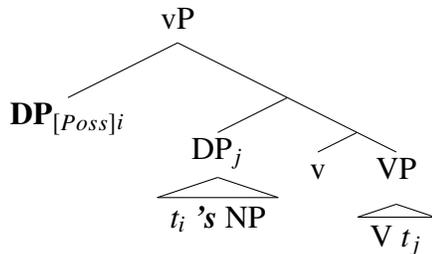
Now consider PE from a theme subject, as seen in unaccusatives and passives. If such arguments are externally merged as complements of V where they receive their theme θ -role, they must move to spec- vP in order to maintain a coherent linearization under CL. Given that English V moves to v (Larson 1988, Chomsky 1995, Kratzer 1996, and others), movement of the theme subject to spec- vP brings it to precede V within vP , just as it will after A-movement to spec-TP. This movement within vP automatically brings a possessor contained by the theme subject to the linear edge of the phase:

(48) **Subject movement in unaccusative/passive vP**



It is also in principle possible for the possessor to extract to the edge of vP , with the theme subject then moving to a lower specifier of vP below the extracted possessor via tucking-in (Richards 1997, 1999) as in (49) below. This string-vacuous possessor extraction satisfies the adjacency requirement of [*'s*] just as if the possessor had not exited DP.

(49) **PE from theme subject with subject tucking-in**



Because the derivation in (48) accomplishes the same thing as (49) but with less movement operations (modulo the different final constituency), we might expect concerns of economy to favor (48). However, nothing of substance for my account changes if the reality is (49), or if both derivations are available.

So far, the adjacency requirement of [*'s*] has not been critically relevant, since we have not yet explored the situations where its influence is particularly important. However, it will become central when we consider the next phase of the derivation.

5.1.2 PE from subjects: The embedded CP level

After the completion of vP, I assume that upon external merge of T, the subject A-moves to spec-TP. When C is merged, the opportunity for PE arrives. In section 2, I showed that at this stage of the derivation, various restrictions hold. In short, as (50) shows again, nothing can intervene between the trace of PE in DP and the linear edge of the embedded CP:

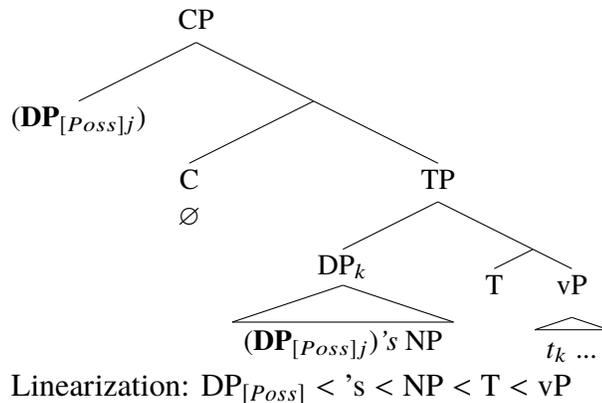
(50) **CP edge restrictions on PE from subjects**

- a. Who_k did you say [(***frequently**) [_k's friend] (frequently) has money]?
- b. Who_k do they think [(***that**) [_k's name] (***that**) is Mary]?

Before examining how things can go wrong in (50), let's establish why these examples are acceptable when the problematic material in the left edge of CP is absent.

If no material is present in the CP edge, after A-movement of the possessed subject to spec-TP, the possessor it contains is already at the linear edge of CP. The possessor could string-vacuously extract to spec-CP, though such movement is unnecessary.

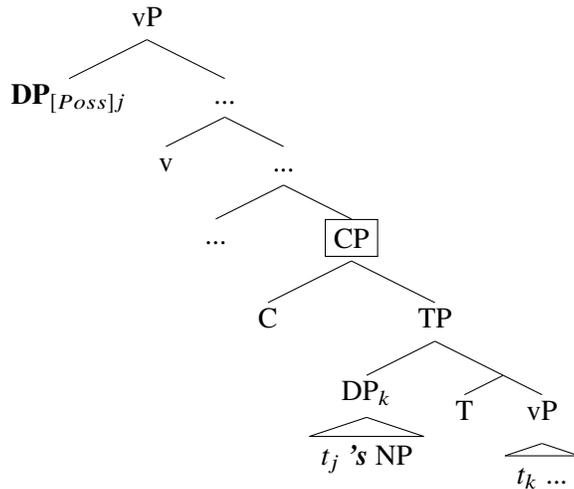
(51) **Harmless string-vacuous PE from subject**



The linear order established at the spellout of this CP satisfies the adjacency requirement of [*'s*], which is linearly adjacent to the possessor at PF whether or not the possessor string-vacuously extracts at this point. CL will also be satisfied here, as the extracting possessor has reached the linear edge of CP either way.

After (51), the possessor can extract into the matrix vP (and then onward), stranding the possessum and the [*'s*] it contains in the lower CP. When the matrix vP spells out, [*'s*] is not present within that phase to enforce its adjacency requirement. This is because [*'s*] has been stranded in a lower phase that has already undergone spellout (as signified by the box around the embedded CP in (52) below), at which point the adjacency requirement of [*'s*] was locally satisfied. As such, extraction of the possessor succeeds:

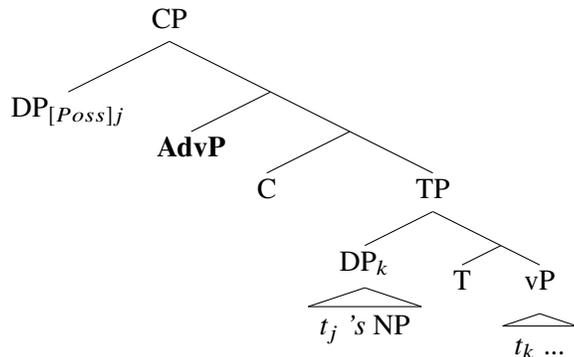
(52) **Successful PE into matrix vP: [*'s*] stranded in embedded CP**



Crucial to this logic is the claim that the adjacency requirement under discussion is a property of the bound morpheme [*'s*] only, not of the possessor.

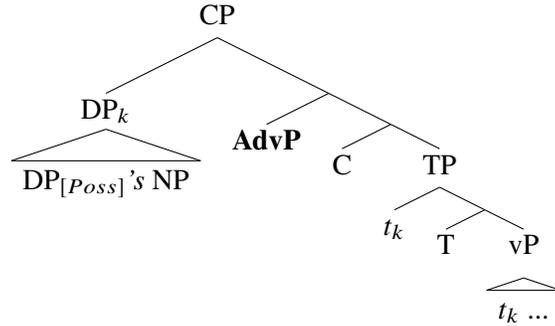
Next, let's examine a derivation where there is problematic material in the CP exited by PE. Consider a derivation like (53) below, where the embedded CP contains an adverb in the left periphery. CL motivates the possessor to exit CP via its linear edge. Therefore the possessor must move to the left of that high adverb, to reach the CP edge. Notice that if it does this, thereby stranding the possessum subject in spec-TP, that high adverb consequently intervenes between the moved possessor and [*'s*]:

(53) **Movement around intervening adverb to linear edge of CP**



While subsequent movement of the possessor from CP in (53) is licit as far as CL is concerned, there is a problem. When this embedded CP undergoes spellout, PF will find the possessor and [*'s*] in this phase non-adjacent due to the intervening adverb. Therefore this CP will be deviant at PF. However, there is a way to avoid this problem: Pied-piping the possessum around that adverb to the edge of CP, along with the possessor (54):

(54) **Pied-piping movement over adverb to the linear edge of CP**



This pied-piping movement in (54) satisfies CL as well as [*'s*] within this embedded CP. After (54), the possessor can extract into the matrix vP, as in (52) above. In such derivations we end up with the high adverb to the right of the stranded possessum, which as we saw in (50a), is the only way to have such an adverb in a CP exited by PE.²²

Derivations in which instead of a high adverb there is an overt complementizer, like (50b), will be identical to what I have just shown for the adverb scenario. If CP contains an overt C, the possessor must move to its left, pied-piping the possessum with it in order to maintain adjacency with [*'s*]. The eventual stranding of the possessum in spec-CP will result in deletion of the complementizer due to the Doubly Filled Comp Filter, something we independently know to hold in English. Thus as (50b) above showed, an overt C on either side of a subject that PE has exited is impossible.

This concludes the analysis of PE from subjects. Next I will show how this account also makes the right predictions for the restrictions on PE from non-subject possessum DPs.

5.2 PE from non-subjects

5.2.1 PE from non-subjects: The embedded vP level

While for PE from subjects nothing of great importance happened within vP, PE from non-subject DPs immediately shows the influence of the concepts under discussion. Recall that PE from a non-subject DP requires that DP to be pied-piped to the edge of the local CP. That is, in contrast to a typical PE language like Hungarian, English PE cannot strand a non-subject possessum in its base position:

(55) **Non-subject exited by PE cannot be stranded in situ**

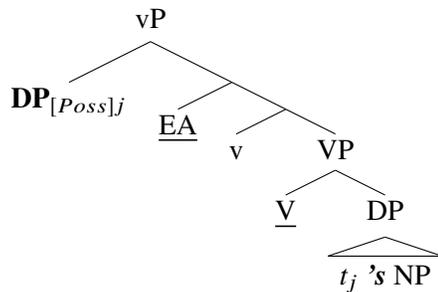
- a. * The person [**who**_j you think [John ate [_j's food]]] is Mary]
- b. ✓ The person [**who**_j you think [[_j's food]_k John ate _k] is Mary]

To begin understanding why this is so, let's first examine such derivations at the embedded vP level. PE from any non-subject DP will work in essentially the same way.

²²This result could also have been reached by adjoining the adverb to the right rather than the left of the subject, but the point is that even if the adverb originates left of the subject, the derivation can converge.

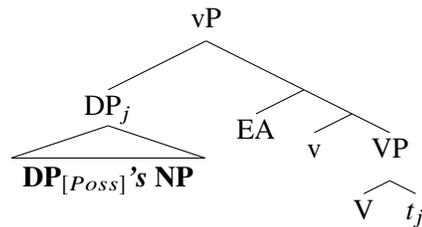
In (56) below we see a transitive vP in which PE has exited a direct object, stranding it in situ in the complement of V. This derivation will be satisfactory for CL, as the moving possessor has reached the linear edge of this phase. However, spellout of this structure will find it to be in violation, since the in situ subject (here EA, the external argument) and V, both underlined below, intervene between the moved possessor and [*'s*]:

(56) * PE from in situ non-subject in vP



The way to satisfy CL as well as [*'s*] is to pied-pipe the object possessum to the vP edge, which brings the possessor to the phase edge while keeping [*'s*] adjacent:

(57) Pied-piping of non-subject possessum in vP



Thus we have an explanation for why base position stranding of a non-subject exited by PE is impossible. Such stranding violates the requirement of [*'s*] at the spellout of vP.

At this point, the possessum has been pied-piped into the edge of vP, but it cannot remain here, as shown below:

(58) Non-subject possessums cannot be stranded in spec-vP

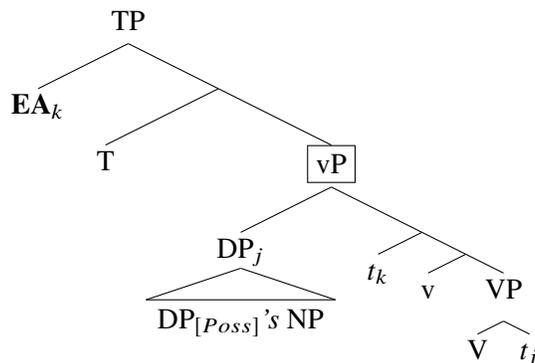
- a. * The person [**who**_j I think [_{CP} they [_{vP} [_{—j}'s food]_k ate _{—k}]]] is Mary
- b. * [**Which student**]_j did you say [_{CP} she [_{vP} [_{—j}'s book]_k found _{—k}]]?

As we've seen in examples like (55) above, the non-subject possessum must be pied-piped to the edge of the embedded CP. This fact is now puzzling, since the proposal so far provides no reason why the pied-piped possessum should not be able to remain in spec-vP, where the adjacency requirement of [*'s*] was met. To see why this account in fact predicts that the possessum cannot remain in spec-vP, let's consider the next phase of the derivation.

5.2.2 PE from non-subjects: The embedded CP level

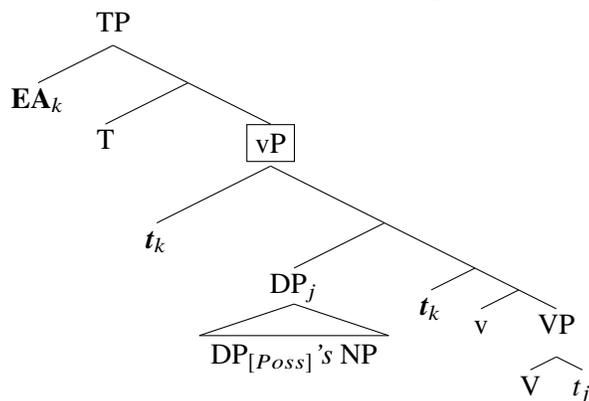
Upon the merge of T, the subject A-moves to spec-TP from its external merge site in the lower spec-vP. This movement carries the subject across the possessum which in (57) was pied-piped to an outer spec-vP, yielding the structure in (59):

(59) **A-movement of subject across pied-piped possessum in vP edge**



Recall that CL motivates elements exiting a phase to pass through that phase's linear edge. We can imagine that for this reason, A-movement of the subject in (59) might stop off in a higher spec-vP, above the moved possessive DP, as in (60) below. However, such a derivation requires movement of the subject from one specifier of vP to another. Such a phrase-bounded spec-to-spec movement is not possible, as discussed in subsection 5.1.

(60) * **A-movement of subject through linear edge of vP**



Thus we expect the only possibility to be the derivation in (59), where the subject non-successive-cyclically moves across the pied-piped possessum in the edge of vP. The derivation in (60) would end up problematic for linearization anyway—here the subject's derived position at the vP edge precedes the possessor, but the possessor will later move to spec-CP post-extraction, where it will precede the subject. Thus the ordering of possessor and subject will end up inconsistent in (60). In contrast, the derivation in (59) avoids a linearization problem, as the possessor precedes the subject within vP, just as will be the case in CP.

As mentioned in section 4.1, CL makes a prediction about how to repair non-successive-cyclic phase exits, which don't pass through the linear edge of the phase. In these scenarios,

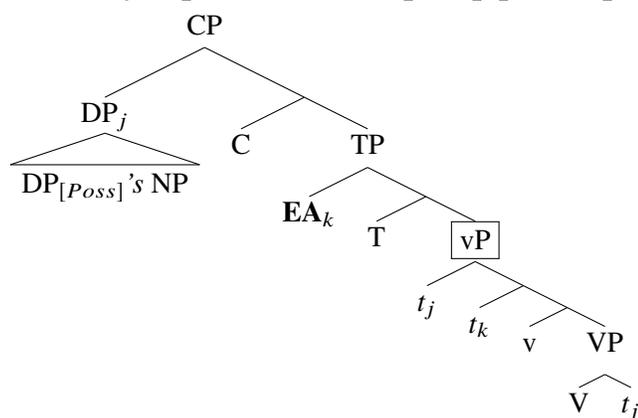
the material crossed over by movement from the non-edge must also move into the next phase. In particular, it must reach a position preceding what previously crossed it. Doing so keeps the linearization information of both phases consistent, as (61) illustrates again:

(61) **Repairing a potential linearization problem**

$$\text{a. } * [_{YP} \alpha [_{PhaseP} \beta [_{XP} \alpha]]] \rightarrow \text{b. } \checkmark [_{YP} \beta \alpha [_{PhaseP} \beta [_{XP} t_\alpha]]]$$

Given this hypothesis, if the A'-moved possessum in spec-vP must be non-successive-cyclically crossed by A-movement of the subject as in (59), we expect that this possessum cannot remain in spec-vP. Rather, it must move to a position that precedes the subject within the next phase. This is precisely what is accomplished by continuing to pied-pipe the possessum along with successive-cyclic A'-movement of the possessor to spec-CP:

(62) **Non-subject possessive DP is pied-piped to spec-CP**



-Linearization of vP: DP_[Poss] < 's < NP < EA < V ...

-Linearization of CP: DP_[Poss] < 's < NP < C < EA < T < vP ...

This additional pied-piping maintains a coherent linearization. The present account thus correctly predicts that non-subject possessum DPs must be pied-piped to the embedded spec-CP under PE. While in principle non-subject possessum stranding in spec-vP should be licit, CL's interaction with A-movement of the subject requires further pied-piping.

After pied-piping the non-subject possessum throughout the derivation of the embedded CP, the possessor can move on freely, as in (52). Nothing forces further pied-piping, as the facts about English PE show us. The possessor extracts on into the matrix clause, with ['s] remaining stranded below in the lower CP phase where its adjacency requirement was met.

We have just gone over a successful derivation of PE from a non-subject, but this is not the end of the story. Recall that, as for PE out of subjects, PE out of non-subjects involves restrictions on the content of the embedded CP—that is, no material may intervene between the trace of PE in DP and the embedded CP edge:

(63) **CP edge constraint on PE from non-subjects**

a. **No overt C on either side of pied-piped non-subject**

Who_j did you say [_{CP} (*that) [_{DP} _j's cat]_k (*that) John saw _k]?

- b. **No adverb left of pied-piped non-subject**
Who_j did you say [_{CP} (*allegedly) [_{__j}'s cat]_k (allegedly) John stole _{__k}]?
- c. **No pied-piped P left of pied-piped non-subject**
Who_j do you think [_{CP} [(**from**) _{__j}'s house]_k we should leave [(**from**) _{__k}]?

The analysis so far yields familiar explanations for these restrictions. On one hand, such material in the left edge of the embedded CP is problematic because the possessor must move around it within CP to satisfy CL. This results in that material intervening between the possessor and ['s] at the time when CP spells-out (see section 5.1.2). Alternatively, if the possessor doesn't move around that material before CP spells-out, that material will be non-successive-cyclically crossed by later movement of the possessor from CP, thus violating CL. Either way, the result is a failed derivation.

Finally, if there are multiple embedded CPs, the possessum can be stranded at any CP edge in the possessor's movement path, given that the constraints discussed here are met:

(64) **PE with double embedding**²³

- a. Who_k do you think ([_{__k}'s cat]) he said ([_{__k}'s cat]) is cute?
- b. Who_k do you think ([_{__k}'s cat]_j) he said ([?][_{__k}'s cat]_j) they saw _{__j}?

5.3 Why English PE requires multi-clausality

Recall that English PE is impossible in mono-clausal derivations (11):

(65) **No PE in mono-clausal derivations**

- a. * Who_k will [_{__k}'s article] be published next year?
- b. * Who_k did they criticize [_{__k}'s article]?

Given that a non-subject possessum must be pied-piped to a CP edge prior to PE as just discussed, there is no chance for the possessor to extract from a non-subject if the derivation contains only one clause. In this case, there is no opportunity for the possessor to break away after pied-piping the possessum to the local CP edge, since at this point the derivation ends. Thus more than one clause is needed for PE from non-subjects to occur.

For similar reasons, PE from subject possessum DPs cannot become evident in a single clause derivation. In such a scenario, any material between the extracted possessor and ['s] that would diagnose the occurrence of that PE violates the adjacency requirement of ['s] within CP, as (66) below illustrates with T to C movement:

(66) **Diagnosing monoclausal PE out of subjects violates adjacency**

- * [_{CP} **Who_k** will(C-T_j) [_{TP} [_{DP} _{__k}'s cat] _{t_j} win the contest]]?

²³We see in (64b) that PE from a non-subject that strands the possessum in the lower spec-CP is somewhat degraded, though by no means absolutely. I leave this fact aside for now, since it does not affect the analysis.

To conclude, this paper has derived the fact that English PE cannot become apparent unless movement of the possessor crosses a clause boundary. Consequently, such PE cannot be surface-evident in mono-clausal derivations. However, nothing said here in principle prevents string-vacuous PE, which cannot violate either CL or the requirement of [*'s*].

This concludes the core analysis of English PE. In the next section, I discuss some general consequences of this analysis, before moving on to some extensions.

6 General consequences

6.1 In support of CL

The CL theory is crucial to the account provided here, because of its inclusion of phase edges in spellout domains. This allows successive-cyclic movement through phase edges to interact with the adjacency condition on [*'s*], which is enforced at spellout. I argued that CL and this condition together derive some otherwise puzzling facts about English PE. These facts are intricate, and the construction in which they hold does not appear to be very frequent (as perhaps indicated by the fact that it is nearly undocumented).

Given this, the complex restrictions on English PE are unlikely to be a set of memorized quirks. Rather, these details should emerge from more general grammatical principles. Indeed, this paper has argued that the facts can be derived from just two principles, one language-specific and one general. The first was a PF condition on [*'s*], and the second was CL. This account proposes that CL is an aspect of UG, automatically possessed by all speakers. Having CL intrinsically, the only thing English speakers must learn to determine whether their grammar bans PE, or permits it in the restricted form described here, is the point in the derivation when the requirement of [*'s*] may be satisfied. As such, to the extent that this analysis is correct, it stands as evidence for CL as an aspect of UG.

An important detail captured by this account is the fact that non-subject possessum DPs must be pied-piped as far as CP under PE. I argued that stranding of non-subject possessum DPs in spec-vP should be possible in principle, though in reality it is not (58). I pointed out that under CL, the crossing-over of this position by A-movement of the subject is predicted to require that it be emptied, thus forcing the possessive DP to be pied-piped further. This is an instantiation of a general prediction of CL explained in section 4.1, that if an element in a phase is crossed by something non-successive-cyclically moving out of that phase, the crossed material must also move out, to a position above what crossed it:

(67) **Repairing a potential linearization problem**

$$\text{a. } * [Y_P \alpha \underbrace{[PhaseP \beta [XP \alpha]]}] \rightarrow \text{b. } \checkmark [Y_P \beta \alpha \underbrace{[PhaseP \beta [XP t_\alpha]]}]$$

In the Chomskyan approach to phases, there is no reason why movement of a lower specifier across a higher one of the same phase should require movement of the higher one as well.²⁴ In section 8, I'll examine a few other scenarios that I argue support this prediction of CL.

²⁴Though see Bošković (2016) for an approach which defines only the outermost edge of phases as being

6.2 The non-phasehood of DP

This account of English PE is not compatible with a theory in which DP is a phase. I have proposed that the adjacency condition of [*'s*] can be satisfied in its local phase, thus allowing the possessor to separate from [*'s*] provided that [*'s*] remains within a phase where its adjacency requirement was met. Given this logic, if DP were a phase in of itself, the requirement of [*'s*] would be immediately satisfied within DP. There would thus be no reason to pied-pipe under PE at all, predicting the possibility of leaving non-subject possessum DPs in situ in VP under PE. As we've seen, this is not possible

The strongest conclusion to draw from this result is that the English DP is not a phase. This is at least superficially in agreement with Matushansky (2005), who argues that the phasehood of DP remains ambiguous. The present paper is compatible with there being a nominal phase boundary below the possessor and [*'s*] (perhaps nP, if categorizing heads are phases (Embick & Marantz 2008, a.o.)), but not a nominal phase above them.²⁵

Like the present paper, Sabbagh (2007) and Zyman (under review) must also exclude DP from the set of cyclic domains. Such research may be compatible with a theory in which the English DP is a phase for Logical Form, but not Phonological Form (in other words, DP is not an independent domain for linearization), a possibility that arises if a given phase need not necessarily transfer its contents to both interfaces. See Citko (2014) for an overview of works that make use of such non-simultaneous spellout.

A corner of English grammar that may provide a diagnostic for DP phasehood is the stranding of *exactly/precisely* under *wh*-movement (Urban 1999). Such adjuncts can be stranded in their base position²⁶, or in an intermediate CP edge:

(68) ***Exactly-stranding***

What_k (exactly) did you say ____k (**exactly**) that she wants ____k (exactly)?

If DPs are phases, which successive-cyclic movement must pass through the edge of, such stranding should be possible in the edge of DP. However, as Zyman (under review) points out, this appears not to be the case. This result is consistent with a non-phasal DP.

(69) **No *exactly-stranding* in the edge of DP**

What_k (exactly) did you write [_{DP} ____k (***exactly**) a book about ____k]?

7 *that's*-relatives as possessor extraction

In this section I discuss an additional context that can be analyzed as involving PE, which I'll refer to as *that's*-relatives (Seppänen 1995, McDaniel et al 1998, 2002). This construction

accessible. Because this approach does not obviously capture the fact that the distribution of English PE is constrained by concerns of linear order, I do not explore such an approach here.

²⁵This hypothesis is evocative of Chomsky's approach to phases, in which the edge is not subject to spellout. However, as discussed in section 4.3, this theory is incompatible with the account given here.

²⁶Actually, Zyman (under review) argues that adjuncts like *exactly* can't be stranded VP-internally, despite appearances, though he maintains that *exactly* can be stranded in phase edges.

can prima facie be described as relativization of a possessor that is accomplished by replacing the typical relative pronoun *who* with *that*:

(70) ***that*'s-relatives**

- a. This is the girl [that's hat is red]
- b. There's the boy [that's cat is fat]
- c. This is the dog [that's food the cat ate]
- d. That is the cat [that's tail the kids pulled]

The concepts defended in this paper so far lead to an account of this construction with the addition of one final proposal from Deal (2016), that TP is a phase in relative clauses.

Deal argues that relativization involves successive-cyclic A'-movement to spec-CP via an intermediate step of movement through an outer specifier of a phasal TP, based on facts about word order, complementizer choice, and case attraction in Nez Perce. Deal argues that this conclusion also explains anti-*that*-trace effects (Bresnan 1972) in English²⁷, in the context of Pesetsky & Torrego's (2001) account of *that*-trace phenomena. While space constraints prevent discussing Deal's analysis in detail here, this claim sheds new light on the derivation of *that*'s-relatives, when the possibility of PE in English is considered.

At first glance, it is conceivable that *that*'s-relatives use an instance of *that* which is a relative pronoun. The position occupied by *that* in this construction is not obvious based on the surface string, but if *that* really can be a relative pronoun, it should be able to take the place of the typical *wh*-operator when relativization involves a pied-piped P. This turns out to be impossible, as we see below:

(71) ***that* is not a fully productive relative pronoun**

- a. Mary is the student [[about **whose**/***that**'s book] I wrote a review]
- b. I saw a man [[on **whose**/***that**'s face] there were many tattoos]
- c. That is the person [[with **whom/which**/***that**] I traveled]
- d. John is the person [[to **whom/which**/***that**] I sent a package]

We expect this result if *that* is in fact never a relative pronoun. In the absence of such a possibility, the natural hypothesis is that the *that* of *that*'s-relatives is simply a complementizer, as usual. If this is so, it suggests that *that*'s-relatives must actually have a gap in possessor position, from which a relativizing operator moves to spec-CP:²⁸

(72) ***that*'s-relative (relativization from subject)**

[_{DP} the girl [_{CP} ∅ that [_{TP} [_{DP} ___ 's hat] is red]]]

²⁷The anti-*that*-trace effect describes the necessity of the complementizer in subject relatives (*The woman *(that) likes cats*). This effect is also present in *it*-clefts (*It's Mary *(that) likes cats*). While uniting cleft clauses with relative clauses is a subject of debate, under Deal's analysis, this fact suggests a TP phase in cleft clauses too. The presence of a TP phase in the cleft clause accurately predicts the availability of a *that*'s-relative-like structure in clefts (*It's John that's family is rich*) under the analysis of this section.

²⁸McDaniel et al (2002) consider several possible analyses of this construction and conclude that modern English is converging on an analysis involving complementizer *that* plus [_S], precisely as this section argues.

Such an analysis might be regarded as ad hoc under standard assumptions about the impossibility of PE in English, but this is not so for the present paper.

This paper has shown the existence of English PE in a variety of contexts, including relative clauses. In these cases (as in others) I argued that the possessum is stranded at the linear edge of an embedded CP, since the possessor can't be extracted unless the possessum is able to occupy the linear edge of a local phase dominating both of them:

(73) **PE in typical relative clauses**

- a. Mary is the author [**who**_k they said [_{CP} [_{__}_k's new book] is good]]
- b. The person [**who**_j you think [_{CP} [_{__}_j's food]_k John ate _{__}_k] is Mary]

Now, if TP is also a phase in relative clauses, there is another possible derivation—instead of the possessum following the moving possessor until reaching a CP edge, the possessum might also be stranded in the TP edge, right below C. Such a derivation will produce a *that's*-relative. In the case of a subject *that's*-relative, the possessor operator will simply exit the subject from spec-TP. This has already been diagrammed in (72) above. In a non-subject *that's*-relative, the non-subject possessum will be pied-piped to the edge of the TP phase before the possessor extracts to spec-CP:

(74) ***that's*-relative with relativization from non-subject**

[_{DP} the cat [_{CP} ∅ that [_{TP} [_{DP} _{__}'s tail] the kids pulled _{__}]]]

Whatever derives the Doubly Filled Comp Filter prevents the extracted possessor from being overtly realized when the complementizer also is. In this situation, we will see a *that's*-relative. If the Doubly Filled Comp Filter is resolved in the opposite way, realizing the possessor operator but keeping the complementizer silent, the possessor and the possessum will simply appear linearly adjacent as they do in typical relative clauses:²⁹

(75) **Complementizer deletion yields a typical relative clause**

- a. The girl [who ~~that's~~ hat is red] (= whose hat is red)
- b. The cat [who ~~that's~~ tail the kids pulled (= whose tail the kids pulled)

Note that this analysis of *that's*-relatives preserves the phase-bounded adjacency constraint on [_{'s}] that I've argued generally restricts English PE. This constraint's interaction with Cyclic Linearization forces a possessum to occupy the edge of a phase dominating it and the possessor prior to PE. Ultimately this is the CP edge in the cases examined earlier in the paper, since the vP edge is unavailable. If TP in relative clauses is also a phase, then in this context the TP edge provides another position where the possessum can be stranded.

²⁹It is possible to have a non-subject relative clause where C and the relativizing *wh*-phrase in its specifier are both silent (*The cake [which that I ate]*), but this possibility does not seem to extend to *that's*-relatives (**The person [who that's friend I like]*). I would like to leave this puzzle aside for the time being.

8 On stranding in spec-vP

The analysis of English PE in this paper leads to some general predictions about how CL will govern stranding in the vP edge, which I examine in this section. See Davis (under review) for a more thorough cross-linguistic consideration of stranding in phase edges.

8.1 Predicting the distribution of stranding at vP

McCloskey (2000) shows that in West Ulster English, *wh*-movement can strand the post-*wh* quantifier *all* either in its base position, or at the edge of an intermediate CP:³⁰

- (76) ***all*-stranding in spec-CP** (McCloskey 2000, ex. 8)
 What_k (all) did he say [_{CP} ___k (**all**) that we should buy ___k (all)]?

McCloskey argued that those intermediate instances of *wh*-associated *all* stranding provide evidence for successive-cyclic A'-movement through CP edges. However, he notes that such stranding in specifiers of vP isn't possible.³¹ This is a puzzle if both vP and CP are phases. McCloskey's analysis of West Ulster English argues that V moves to a head above vP, thus his examples showing this gap attempt stranding after V, as in (77) below:

- (77) **No *all*-stranding in spec-vP** (McCloskey 2000, ex. 14e)
 What_k did he tell_j [_{vP} ___k (***all**) ___j his friends [_{CP} ___k (all) that he wanted ___k]]?

The concepts defended in the present paper predict this fact, for two reasons.

First, recall that CL requires a phrase A'-moving from vP to stop in its most linearly peripheral position, which must be a specifier above the subject in situ in a lower spec-vP. The subject later A-moves to spec-TP across that outer spec-vP, presumably non-successive-cyclically as argued in 5.2.2. There is no problem with this derivation, as long as the A'-moved material in the outer spec-vP moves along to spec-CP. However, if A'-movement were to strand *all* (or anything else) in that spec-vP, movement of the subject across that stranded material is predicted by CL to cause a linearization problem:

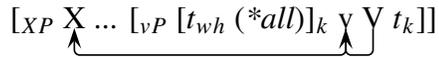
- (78) **A-movement across outer spec-vP**
 [_{TP} T ... [_{vP} [_{t_{wh}} (***all**)]_k SUBJ v V t_k]]

A second reason why *wh*-associated *all* stranding is banned in spec-vP has to do with head movement. McCloskey argues that V moves out of vP in West Ulster English. If heads can only move to other heads, there is no position V can move to that precedes the specifiers of vP within this phase. Therefore movement of V from vP will necessarily non-successive-cyclically cross any specifiers of vP, banning stranding there:

³⁰A reviewer notes that if such stranding is really in spec-CP, the fact that an overt C can co-occur with it is surprising, given something like the Doubly Filled Comp Filter. While I cannot comment on this in detail here, it is conceivable that the Doubly Filled Comp Filter only applies when a full phrase is sitting in spec-CP (rather than something like a remnant quantifier) The same might be said of examples like (68).

³¹Henry (2012) shows that there is more variance on *all*-stranding in West Ulster English than reported in McCloskey (2000). I will leave varieties other than the one studied by McCloskey aside for now.

(79) **Head movement across spec-vP**



This analysis predicts that stranding in spec-vP is possible only when what is stranded isn't later crossed by non-successive-cyclic movement from vP. One case in which this prediction may be borne out comes from Ko (2011). Ko argues that object scrambling in Korean can strand a numeral quantifier in spec-vP, above an in situ subject (80). Since the subject does not move from vP here, we indeed predict stranding in spec-vP to be permitted. V also cannot have moved leftward across spec-vP, since Korean is head-final:

(80) **Stranding numeral quantifier in spec-vP in Korean** (Ko 2011, ex. 24)

Kong-ul_k amato [vP [_k **sey-kay**]_j haksayng-tul-i _j patassulkesita]
 Ball-ACC probably 3-thing student-PL-NOM received
 'The students probably received three balls'

The same is possible in Japanese, which has the same relevant properties as Korean:

(81) **Stranding numeral quantifier in spec-vP in Japanese** (P.c. Takashi Morita)

Ringo-o_k osoraku/tabun [vP [_k **san-ko**]_j John-ga umaku _j nusun-da]
 Apple-ACC probably 3-thing John-NOM well steal-PST
 'John probably skillfully stole 3 apples'

A phenomenon in English that provides convergent evidence for this approach comes from the stranding of adjuncts like *exactly/precisely* under *wh*-movement. To review, such adjuncts can be stranded in their base position, or in an intermediate CP edge, as we saw in (68) above. A-movement of the subject in English should rule out *exactly*-stranding in spec-vP. I argue that this prediction is accurate. Example (82) below only has an odd reading construing *exactly* as an adverb of v/VP, rather than a stranded modifier of DP:

(82) * **Spec-vP exactly-stranding**

[_{CP} What_k did you [vP _k (***exactly**) eat _k]]?

A similar stranding pattern can be found with other DP adjuncts of quantity/degree, like *to the nearest pound*, which can be stranded in its base position or at a CP edge:

(83) **Quantity adjunct stranding**

Tell me [_{CP} [how much flour]_k (to the nearest pound) you said [_{CP} _k (**to the nearest pound**) that the bakery wants _k (to the nearest pound)]]

Such an adjunct is not strandable in spec-vP. With this adjunct the judgment is clearer than for the *exactly*-stranding in (82), as it cannot easily be construed as an adverb of v/VP:

(84) * **Quantity adjunct stranding in spec-vP**

[How much flour]_k (to the nearest pound) did the bakery [vP _k (***to the nearest pound**) ask for _k (to the nearest pound)]?

Example (84) shows this fact in a transitive sentence, but the same restriction holds in passive (85) and unaccusative (86) derivations:

- (85) * **Quantity adjunct stranding in spec-vP: Passive**³²
 [How many boats]_k (to the nearest hundred) has the American navy [_{vP} ____k (***to the nearest hundred**) been provided with ____k (to the nearest hundred)]?
- (86) * **Quantity adjunct stranding in spec-vP: Unaccusative**
 [How many firefighters]_k (to the nearest dozen) did the house [_{vP} ____k (***to the nearest dozen**) burn down despite the efforts of ____k (to the nearest dozen)]?

This is expected, if CL requires internal argument subjects to pass through the vP edge in order to precede V (section 5.1). From that position, A-movement to spec-TP crosses anything stranded in the periphery of vP by A'-movement, causing a linearization violation.

8.2 Diagnosing the origination of expletive *there*

In section 2, I demonstrated that expletive associates exited by PE end up pied-piped to the edge of the local CP, just like all non-subject DPs, as repeated in (87):

- (87) **PE from expletive associate** (=15)
- a. * **Who**_j did Mary say [there were [____j's **books**] on the table]?
- b. ? **Who**_j did Mary say [[____j's **books**]_k there were *t*_k on the table]?

This possessum stranding can be used as a diagnostic for the derivational history of expletive *there*. Several works argue that expletive *there* is externally merged in spec-vP (Biberauer & Richards 2005, Deal 2009) before A-moving to spec-TP. If this is so, we expect A-movement of the expletive to result in a crossing effect that makes it impossible for PE to strand the expletive associate in spec-vP.

Example (87b) is ambiguous between stranding in situ or in spec-vP, since copular V in English moves to T, unless T is filled by an auxiliary. Therefore (88) below adds an auxiliary in order to allow V to remain low, and disambiguate the position of stranding. Here we see that the expletive associate exited by PE cannot remain in a position corresponding to spec-vP, as expected if the expletive moved from vP:

- (88) **Expletive associate must strand in spec-CP under PE**
Who_k do you think [_{CP} (____k's **friends**) there have [_{vP} (____k's **friends**) been a lot of stories told to (____k's friends)]]?

This conclusion is supported by the fact that adjunct stranding in spec-vP under *wh*-movement of the sort discussed in section 8.1 also is not possible in expletive constructions:

³²I assume that the edge of the clause-internal phase in passives is left of the passive auxiliary *be*, which following Harwood (2015), is merged in v.

(89) **No spec-vP DP adjunct stranding with expletive**

- a. [How many students] have there [_{vP} (***exactly**) been in the office today]?
- b. [How many kilos of gold] (to the nearest hundred) have there [_{vP} (***to the nearest hundred**) been consumed in the production of fancy pens]?

These facts only stand as evidence for A-movement of the expletive if vP is a phase in expletive constructions. If it is not, there would be no reason to expect successive-cyclic movement through, or stranding in, this position. Thus some evidence for phasehood in this environment is necessary. Nissenbaum (2000) argues that parasitic gaps in clausal adjuncts are licensed by successive-cyclic movement through spec-vP. Thus if such a parasitic gap can be licensed in a given environment, it suggests that successive-cyclic movement through spec-vP occurred. Legate (2003) used this logic to diagnose the phasehood of verb phrases in several contexts, but Legate did not perform this test in expletive constructions. When we do, I argue that we find successful PG licensing:

(90) **PGs in expletive constructions**

- a. ? Who_k was a there a big rumor about ____k [after the police arrested PG_k]?
- b. ? [Which employee]_k was there a party for ____k [before the boss promoted PG_k]?

To the extent that this constitutes evidence for a vP phase in expletive constructions, the facts in (88-89) indicate movement of the expletive from vP.

9 Conclusion

This paper described and analyzed the complexities of PE in English, a little-studied possibility for many speakers. I argued that English PE provides evidence for Cyclic Linearization as an aspect of UG, which constrains English PE via its interaction with a phase-level version of an independently proposed PF condition on [’s]. I argued that this analysis leads to insights about the phasehood of DP, the derivation of *that’s*-relatives, some constraints on stranding in vP, and the origination of expletive *there* in vP.

9.1 On the adjacency condition of [’s]

Following works proposing that PE in mainstream English is banned because [’s] must be adjacent to the possessor at PF, this paper hypothesized that the constrained nature of English PE emerges when such a requirement is enforced at a more minimal level.³³ Namely, I

³³This adjacency requirement resembles the alignment constraints sometimes used in Optimality Theoretic phonology (McCarthy & Prince 1993), which motivate the edges of certain categories to coincide. In Optimality Theory, all constraints are in principle violable. If the need for adjacency between possessor and [’s] is reducible to the influence of alignment constraints, we expect it to be potentially violable as well. For speakers without PE, we might say that this adjacency requirement completely overrides economy of movement, always forcing pied-piping. In contrast, for speakers with PE this adjacency is violable, but not

hypothesized that while such a constraint is globally enforced in English grammars without PE (42), those with PE can satisfy this constraint at the minimal phase level (43).³⁴

If such adjacency constraints can generally be locally evaluated in this way, we should expect to see phenomena in other languages analogous to the distribution of English PE examined here—that is, we should find circumstances where something like a bound morpheme can only be stranded after some movement occurs. I have not yet found more facts that obviously fit this description. If this proves to be unattested, it may be the case that the English grammar studied here is atypical and therefore likely unstable. If this is so, we may expect this grammar to re-arrange itself in coming generations.

Provided that my empirical arguments for this constraint are successful, understanding it more deeply should indeed be a topic for further research. My hope is that the insights of this paper (the impact of Cyclic Linearization being the main one) will be preserved independent of what concepts are ultimately brought to bear on this constraint's explanation. In [redacted, (in prep.)] this is precisely what I aim to achieve, by connecting this constraint to a broader perspective on the interaction of syntax, linearization, and the PF interface.

10 Appendix: Topic/focus movement and weak islands

In section 2, I assumed following Gavrusseva & Thornton (2001) that the displacement of non-subjects to the embedded CP edge under PE is caused by pied-piping along with A'-movement of the possessor. Alternatively, we might hypothesize that this displacement is caused by the non-subject possessum undergoing a step of topic/focus movement into the left periphery of the embedded CP prior to PE, since such movement is independently

utterly, since for part of the derivation pied-piping must apply. Allowing adjacency to be broken only after some minimal satisfaction is also evocative of Richard's (1988) Principle of Minimal Compliance. However, if this adjacency requirement is in principle violable depending on language-internal priorities, we predict a third sort of English grammar—one in which this adjacency constraint is prioritized so low that it asserts no influence. There is some preliminary evidence for such a variety. An anonymous reviewer points out that in a highly colloquial register, they tolerate PE with no pied-piping, stranding an object in situ:

- vi. a. ? So tell me, [which girl]/who_k didja/'dja meet [____k's friend] yesterday?
- b. ? So tell me, [which girl]/who_k d'you think he met [____k's friend] yesterday?

³⁴It would also suffice to state that both grammars evaluate the adjacency requirement phase by phase, but differ in which element the requirement is stated in terms of. As I've argued, a grammar with PE of the sort analyzed here is derived when it is a requirement of [_s] that it be adjacent to the possessor at the phase level. This allows [_s] to be stranded in a lower phase where adjacency was satisfied at spellout. This was captured by the constraint in (43), but we can reverse (43) in the following way to derive a grammar with no PE:

- vii. **Possessor-Genitive Adjacency (Reversed, but still local version)**

The possessor must be adjacent to [_s] at the spellout of the minimal phase (vP, CP) containing the possessor.

In a grammar with such a constraint, a violation is incurred whenever the possessor moves into a phase that does not include [_s], thus banning PE from ever succeeding.

possible for many speakers. Since the possessum reaching the CP edge is what is essential under this paper's analysis, either of these alternatives could in principle get the right results. Thus this choice does not affect the central findings of this paper, but there are reasons to believe that the topic/focus movement analysis is not correct.

Importantly, several of my informants who accept the relevant PE examples independently reject topic/focus movement. Further, for those that permit topic/focus movement, the semantic/pragmatic effect of such movement is absent in PE examples. For instance, consider (91a) below, where the fronted phrase *John's cake* is associated with a particular information structure: either setting up John's cake as the topic of the clause, or focusing on John's cake in contrast to other alternatives. PE speakers capable of such topic/focus movement report that such information structure is absent from PE sentences with a displaced non-subject like (91b). Such PE examples have a neutral information structure (modulo question-hood), just like their full pied-piping equivalents do (91c):³⁵

- (91) a. [John's cake]_k, I really liked ___k [Topic/focus movement]
 b. Who_j did you say [[___j's cake]_k they really liked ___k]? [PE]
 c. [Whose cake]_k did you say [they really liked ___k]? [Pied-piping equivalent]

If the topic/focus movement analysis is really incorrect, the relevant PE sentences should be accepted even with matrix verbs that ban embedded topicalization. Hooper & Thompson (1973) show that verbs like *doubt* and *deny*, which do not assert their complement, ban embedded topicalization (among other "root transformations" like VP fronting). It turns out that PE examples with such verbs fail, as (92) shows by comparing a bad PE sentence (92a) with its acceptable pied-piping equivalent (92b).

- (92) a. * Who_k do you **deny/doubt** [[___k's cat]_j they abused ___j]?
 b. [Whose cat]_k do you **deny/doubt** [they abused ___k]?

But if topicalization were the issue here, the relevant PE examples should be permitted with factive verbs like *realize*, *know*, *see*, which Hooper & Thompson show allow embedded topicalization. Importantly, PE with such embedding verbs also fails:

- (93) a. * Who_k did you **know/realize/see** [[___k's cat]_j they abused ___j]?
 b. [Whose cat]_k did you **know/realize/see** [they abused ___k]?

Both non-assertive verbs like *doubt*, *deny* in (92) and the factive verbs in (93) are classified as weak islands (see Szabolcsi and Lohndal (2017) for a recent overview). This group also includes *wh*-islands caused by *whether*, which interfere PE as well:

- (94) a. * Who_i do you wonder [whether we said [[___i's friend]_k we like ___k]]?
 b. [Whose friend]_k do you wonder [whether we said we like ___k]?

³⁵The prosodic profile typical of topic/focus movement is also absent from examples like (91b).

Negation and NPI licensers like *few / only* also induce weak islands, and degrade PE (95a vs. 95b) A similar contrast holds for basic negation (95c vs. 95d). While this violation is not absolute, a contrast is evident for many speakers.³⁶

- (95) a. [Whose art]_k have **few people/only they** said [___k is interesting]?
 b. *^{?%} Who_k have **few people/only they** said [[___k's art] is interesting]?
 c. That's the author [[whose work]_k I didn't say [___k is **any** good]]
 d. ^{%?} That's the author [who_k I didn't say [[___k's work] is **any** good]]

Overall, the hypothesis that PE is dependent on topic/focus movement fails to describe the actual set of circumstances in which it is degraded, which fits the set of weak islands. English PE is in essence a sort of left branch extraction (Ross 1967), and some other left branch extractions in western European languages are also sensitive to weak islands, like *combien*-split in French (Obenauer 1984) and *wat voor / wat aan*-split in Dutch (Corver 1990, Beermann 1997, Honcoop 1998). Thus weak island sensitivity in English PE falls within the purview of known constraints on (some) left branch extractions.

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³⁶Examples (95b/d) are best with focus on the intervener, an amelioration known for this island effect, which is sensitive to a number of such semantic/pragmatic factors (Kroch 1989, Kuno & Takami 1997, a.o.).

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