

Possessor Extraction in Colloquial English: Evidence for Successive-Cyclicity and Cyclic Linearization*

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Abstract: This paper describes and analyzes possessor extraction (PE) in English, a restricted possibility in the colloquial language of some speakers. I argue that this phenomenon reveals evidence for the Cyclic Linearization theory of spell-out (Fox & Pesetsky 2005, a.o.), which constrains English PE by interacting with a (phase-level) requirement to keep the possessor and possessive D adjacent at PF (Gavruseva & Thornton 2001, a.o.). These factors prevent such PE from succeeding unless the possessum is stranded in a clause edge, among other restrictions. This analysis entails the non-phasehood of DP, clarifies the derivation of *that's*-relatives, reveals some linearization constraints on stranding, and suggests that expletive *there* originates 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, though I omit this from 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 [*'s*]. The past tense and plural subject of the relative clause in (2) where PE is taking

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place eliminate the possibility of this element being subject agreement. The fact that the possessor is female also removes any possibility of this being a reduced resumptive *his*.

Though not all native speakers accept such PE examples, the present study of 34 speakers, mostly residents of the Boston area, resulted in 19 judging PE of this form to be acceptable.¹ Those who accept the construction frequently note that it is distinctly colloquial, a fact that may contribute to its rarity in written form.² Some speakers are aware that they are capable of English PE, while many others are surprised to notice its acceptability when it is brought to their attention. 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 Gavrusseva & Thornton (2001), discussed in the next subsection.⁴ While I argue that English PE is true movement, we will see that its distribution is quite restricted, which plausibly contributes to the fact that it has not been widely noticed. An analysis of this construction’s restrictions and their consequences for syntactic theory is the focus of this paper.

¹My informants are mostly American, though the set of speakers who accept PE includes two Canadian, one Australian, and one British individual. There is no clear generalization about the age/origin/background of speakers with PE.

²English PE can be found in informal writing, however, as the following examples retrieved from the Internet show:

- 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)

³In addition to the Finno-Ugric Hungarian, PE is attested in Chamorro (Austronesian, Chung 1991), the Mayan languages Tzotzil (Aissen 1996) and Chol (Coon 2009), as well as much of the Slavic family (Ross 1967, Bošković 2005, a.o.). Romance and Germanic languages permit some extraction of post-nominal/PP possessors (Gavrusseva 2000).

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.

1.1 Background

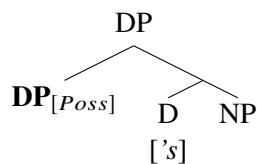
The possibility of this form of PE contrasts with the known impossibility of extracting *whose* (which I take to be *who* + [*'s*]), or any possessor marked with [*'s*] in English:

(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.), then *whose* and elements like it are not syntactic constituents, and therefore their immobility is expected. However, the specifier of [*'s*] is surely a phrase, which as such is in principle extractable:

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



While the possessor DP in the specifier of [*'s*] can indeed be moved for some speakers as (2) above 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 a requirement of PF (Phonological Form) which rejects movement that separates a possessor from the possessive D (Chomsky 1995, Radford 1997, Gavruseva 2000, Gavruseva & Thornton 2001, a.o.). Indeed, Gavruseva (2000) argues that PF adjacency requirements of this variety play an important role in constraining PE cross-linguistically. In this paper, I 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 the speakers who permit it lack such an adjacency requirement, but rather shows that such speakers can satisfy this requirement more locally. This analysis accurately predicts a constrained form of PE in English, as we’ll see.

Gavruseva & Thornton’s (2001) investigation of PE focused on *whose*-questions in child speech, where PE is quite frequent in long-distance questions. 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) observed PE in adult speech. 11% of their adult data comprises PE of the form shown in (2) above.⁵ The authors suggest that this 11% is the result of production errors. However, almost all such instances of PE gathered in their 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

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.

often. These speakers evidently have PE as a productive option. Indeed, in this work I argue that PE is a reality for some English speakers, though subject to restrictions, several of which Gavrusseva & 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 demonstrated in the next section:

(6) **Generalization about English PE and clause edges**

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

One particularly clear instantiation of this generalization is evident with PE from non-subjects, exemplified in (7) below. This example shows 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]?

I argue that the generalization in (6), which describes (7) and related restrictions, emerges from two concepts: the Cyclic Linearization (CL) theory of spellout (Fox & Pesetsky 2005a/b, Podobryaev 2007, Sabbagh 2007, Fanselow & Lenertová 2011, Ko 2007, 2011, 2014, Erlewine 2017, Davis 2019), and a version of the independently proposed requirement that the possessor and possessive D [*'s*] be adjacent at PF. In particular, I argue that while English speakers that reject PE enforce adjacency between possessor and [*'s*] absolutely, in contrast, speakers who permit PE can satisfy this requirement locally, in the way (8) states:

(8) **Possessor-['s] 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*].

According to CL, with which (8) interacts to yield the restricted distribution of English PE, 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 information, and thus yields a variety of constraints on movement, as we'll see.

The power of CL in predicting the details of English PE, a restricted and apparently infrequent construction, provides evidence for a mechanism like CL as an aspect of Universal Grammar (UG). Under this account, CL is a part of the grammar of both speakers who

permit PE and those who do not. 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 of the paper

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 this account's consequences for syntactic theory, namely, the correctness of the CL approach, and the non-phasehood of DP. Section 7 extends this account to a novel analysis of *that's*-relatives (Seppänen & Kjellmer 1995, McDaniel et al 1998, 2002), which supports Deal's (2016) proposal 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 restricted distribution of English PE

This section describes the facts about English PE. This exposition involves some preliminary analysis, leading to the generalization in (6) above, which this paper will derive in section 5 below.

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

- (9) a. **Matrix question**
Who_k do you think [[___k's kid] ate the most cake]?
- 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 they 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's life might be boring, but let me tell you about Jim. **This guy**_k, I think [[___k's story] will intrigue you]

Most of the PE examples shown so far have involved extraction of *who*. Other possessors can be extracted also, as (10) below shows. Extraction of phonologically larger possessors

is often judged as more difficult to accept.⁶ For maximal clarity of judgments, most of the PE sentences reported in this paper involve extraction of *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 **papers**] fell off the shelf]?
- c. I went to the place [**which**]_k she said [[___k's **pastries**] are tastiest]]⁷

Further examination of this construction reveals numerous restrictions. 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 is not possible for clause-bound movement:

(11) **No PE with clause-bound movement**

- 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 extraction 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, as (12) shows once again:

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

- a. * **Who**_k do they think [_{CP} Sue found [___k's **cat**] today]?
- b. ✓ **Who**_k do they think [_{CP} [___k's **cat**]_j Sue found ___j today]?
- 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 obligatory application of this displacement for PE from the object of a transitive clause. As (13-15) below show, the same occurs with non-subject possessum DPs in general. Examples (13-14) show that this displacement holds for PE from either non-subject argument of a ditransitive:

⁶Gavruseva (2000) observes that the set of phrases capable of PE in a given language is subject to some idiosyncrasy, and this may be true of English as well, but this issue requires more systematic study.

⁷The possibility of examples like (10c) is interesting in light of the fact that *which* cannot occur with [_s] in non-extraction circumstances (**which's*). Whatever the source of this unacceptability is, it is apparently avoided by movement. While there is preliminary evidence that the same holds for other typically unacceptable *wh*-possessors (**where's* / **what's* / **when's*), the study of this effect must wait for other work.

⁸I use the term 'non-subject' to refer to all DPs whose base position prior to A'-movement is not spec-TP, but a lower, post-verbal position.

(13) **PE from direct object of a ditransitive**

- 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 object of a ditransitive**⁹

- a. **Who_j** do they think [[___j's **kid**]_k we should give ___k the prize]?
- b. **Who_j** do they think [[___j's **kid**]_k we should give the prize to ___k]??

Example (15) shows that the same holds for expletive associates. Such arguments are post-verbal by default, though under PE they must end up at the edge of CP, as in (15c). This example is marked, but clearly improves on (15b), which lacks the needed displacement.¹⁰

(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 ___k on the table]?

Gavruseva & Thornton noticed the obligatory displacement of non-subject possessum DPs under PE (specifically of objects) in their study as well, in both children and adults. They hypothesize that this is caused by the possessor's movement pied-piping the possessum to the specifier of the embedded CP, and then stranding it there by subsequent extraction. This is the view that the present paper defends. If this analysis is correct (as the appendix argues in greater detail),¹¹ then such stranding provides evidence that movement from CPs successive-cyclically passes through their edge, joining similar arguments from previous literature on stranding in mainstream English (Urban 1999), West Ulster English (McCloskey 2000, Henry 2012), Polish (Wiland 2010), and Wolof (Torrence 2019), among other languages. These works show elements that can be stranded in a CP edge, as well as in their base position. We have just seen, however, that English PE from a non-subject possessum does not allow the possessum to be stranded in its base position (in contrast to PE in Hungarian, as shown in (3) above). This fact suggests that English PE is more complex than typical cases of stranding.

⁹Though A'-movement of indirect objects is independently ruled out for some speakers.

¹⁰A reviewer notes that the degradation of (15c) may be due to the fact that the nature of a phrase's possessor influences its ability to be an expletive associate: *who* is not independently a licit *there*-associate (ii), and a phrase containing *who* may be dis-preferred as a *there*-associate for this reason. As far as I know this is true of *wh*-phrases generally, meaning that examples like (15c) cannot be formed without some degradation.

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

¹¹Specifically, the appendix of this paper argues that this displacement of non-subjects is not caused by something like topic/focus movement into the left periphery of the embedded clause prior to PE, which is the most plausible alternative analysis that I am aware of.

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

We've seen that PE from non-subject possessum DPs requires displacement of the possessum to the edge of the local CP. At first glance, this fact suggests that PE is only possible from the structurally highest DP in the clause. Before any A'-movement, 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 a post-nominal possessor from a subject should be grammatical. In reality, such configurations are not accepted (16):

(16) No PE of post-nominal possessors

- 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 (16) to the known fact that extraction from subjects is frequently degraded. The examples in (16) improve if ['s] is absent (to the extent that extraction from indefinite subjects is relatively tolerable), indicating that this morpheme's requirements are influential in constraining PE, as this paper argues.

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

(17) Generalization about English PE and clause edges [=(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:

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

Given (17), we expect the unacceptability of (16), since here there is overt material separating the trace of PE from the left linear edge of CP. Additional facts about English PE shown in the remainder of this section have the same explanation.

Before moving on to the remaining facts, notice that the generalization in (17) is consistent with the displacement of non-subject possessum DPs under PE that we saw earlier in this section: without reaching the CP edge prior to PE, (17) could not be met in such configurations. This generalization also clarifies the impossibility of PE for clause-bound movement, shown in (11) above: if (17) holds, PE cannot become evident unless the possessor exits a possessum in an embedded CP edge.

2.1.1 Preposition stranding and PE

PE is not possible from a DP within a PP, thus that P must be stranded prior to PE:

(19) Pied-piped P with displaced non-subject blocks PE

- a. Who_j do they think [[___j's house]_k we should leave **from** ___k]?
- b. * Who_j do they think [[**from** ___j's house]_k we should leave ___k]?
- c. Who_j did they say [[___j's cat]_k we should give the prize **to** ___k]?
- d. * Who_j did they say [[**to** ___j's cat]_k we should give the prize ___k]?

As with other non-subject DPs, PE from the DPs in (19) requires them to be displaced to the edge of the local CP, presumably via pied-piping with the possessor's movement as discussed above. These DPs originate inside of PPs, and even though P may typically be pied-piped along with A'-movement of its DP complement in English, in (19) only P-stranding is permitted. This is what we expect given (17): if P is pied-piped along with movement of the non-subject possessum to the CP edge, then P illegally intervenes between the left edge of the embedded CP and the trace of PE in DP.

2.1.2 Complementizers and PE

The distribution of complementizers 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 complementizer *that* in the embedded clause:

(20) Overt complementizer *that* with non-subject extraction

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

Subject extraction, however, is not compatible with an overt complementizer *that*, a phenomenon well-known as the *that*-trace effect:¹²

(21) *that*-trace effect with subject extraction

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

PE from a subject is also incompatible with the complementizer *that* (22). This fact is interesting because here we have extraction from, but not (cross-clausal) movement of, the subject. Thus this fact does not necessarily instantiate the *that*-trace effect:¹³

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

- a. Who_k do you think [(***that**) [___k's friend] always laughs at bad jokes]?

¹²At least in mainstream English, since as a reviewer points out, there are other English varieties that allow configurations that would incur a *that*-trace violation in standard English (Sobin 1987).

¹³This fact is compatible with accounts of the *that*-trace effect as a linear filter on an overt C *that* adjacent to a trace (Bresnan 1972, Chomsky & Lasnik 1977). I do not aim to say anything about complementizer-trace effects in this paper, since the account presented here predicts (22) automatically.

- b. Who_k did they say [(***that**) [___k's window] broke during the storm]?

Notice that in (22), the presence of the *C that* to the left of the possessum subject separates the trace of PE within this DP from the left linear edge of the local CP. Thus the unacceptability of the complementizer here is expected, since it violates (17).

Non-subject DPs exited by PE also cannot be preceded by an overt *C that* (23). However, if the possessum in such configurations is stranded in spec-CP as discussed earlier in this section, then *C* should be unable to precede it anyway, independent of the fact that a complementizer in this position would also violate (17). An overt *C that* to the right of the possessum here is also impossible, as expected given the Doubly-Filled Comp Filter (Chomsky & Lasnik 1977).

(23) **No overt *C that* with PE from 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

Typically, high adverbs may occur on either side of the English subject:

(24) **Variable high adverb position**

- a. (Fortunately) Mary (fortunately) has money.
 b. (Usually) John (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 an extra taco]?

This is expected if (17) holds, since an adverb to the left of the possessum subject linearly intervenes between the trace of PE in this DP and the edge of CP. PE from a non-subject, involving stranding in the CP edge as we've seen, 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

This section has shown that English PE is subject to the generalization in (17), which describes the fact that no overt material may intervene between the trace of PE within DP, and the left linear edge of the local CP. This paper will argue that this generalization emerges from the interaction of CL, and an adjacency requirement of ['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 shown in this section might, at first glance, be attributed to restrictions on what [*'s*] can cliticize to. Upon closer inspection, however, it becomes unclear how to state what the relevant restrictions would be. We have seen that [*'s*] can attach to verbs in PE contexts (2, and many more) but not adverbs (25, 26), or functional heads like P (16, 19) or C (22, 23).¹⁴ 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 in typical non-PE contexts it is not selective, and can cliticize to adverbs and functional heads, among other elements (Zwicky 1987).

(27) Typical indiscriminating cliticization of [*'s*]

- 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, this paper accounts for the facts about English PE without positing such restrictions on [*'s*]. With this hypothesis set aside, the next section makes the case that English PE is truly movement, setting the stage for the core analysis previewed above.

3 English PE is true extraction

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 it contributes an additional verb to 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]

¹⁴PE 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 that this is attributable to a garden path effect.

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

As (29) shows, parentheticals are not independently permitted in this DP-internal position (Emonds 1976, a.o.), weakening the parenthetical analysis of PE:

- (29) **Parentheticals are not permitted between DP_[Poss] and [’s]**
- a. [_{DP} John (***in my opinion/*of course**)’s idea] is funny
 - b. [_{DP} A friend of the teacher (***Mary said/*in fact**)’s] visited 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 inferior to the movement analysis.

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, subtracting the content that is supposedly parenthetical should yield a licit configuration. This diagnostic reveals numerous PE configurations that cannot have been derived by use of a parenthetical.

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:¹⁵

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

Similar facts become evident when we consider the phenomenon of ‘Free Deletion in Comp’ (Chomsky & Lasnik 1977), which can derive examples like (31), where the *wh*-operator responsible for relativization is silent:

- (31) **Relativization with null operator**
- a. The one [_{wh}_k/∅_k I like ____k]
 - b. The cat [_{wh}_k/∅_k I saw ____k]

Comparable PE sentences with no overt *wh*-operator are possible (32).¹⁶ Removal of the supposed parenthetical material from such sentences yields an acceptable result:¹⁷

¹⁵Thought 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?

¹⁶These PE examples with a null relative operator behave the same as PE examples with an overt operator, including, as we see in (32b/c), the property of pied-piping non-subject possessum DPs to the local CP edge. The coming analysis in section 5 attributes this pied-piping to the interaction of CL and a requirement of adjacency between [’s] and the possessor, but such adjacency is not obviously relevant when, as in these examples, the possessor is covert. I hypothesize that the possessor here was originally overt as usual, before later being removed from the surface string via the mechanism responsible for Free Deletion in Comp.

¹⁷Though the post-subtraction strings in (32) are acceptable on an irrelevant structurally distinct parse.

(32) **PE with null relativization**

- a. The person [\emptyset_{WHk} **I said** [[$_k$'s cat] meows too much]]
→ * The person['s cat meows too much]
- b. The person [\emptyset_{WHk} **I said** [[$_k$'s cat]_j you saw $_j$]]
→ * The person['s cat you saw]
- c. The person [\emptyset_{WHk} **I think** [[$_k$'s friend]_j you talked to $_j$]]
→ * The person['s friend you talked to]

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

(33) **Adjunct control with PE**

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

To sum up, given that parenthetical subtraction fails in numerous PE configurations, I argue that this construction is not derived by insertion of a parenthetical.

3.2 PE is blocked by non-bridge verbs

If English PE is an illusion caused by a DP-internal parenthetical, then we expect the set of verbs that are licit in parentheticals, and the set of verbs that can appear to be crossed by illusory PE, to be the same. 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 productive in parentheticals (Zwicky 1971, p. 255). As (35) shows, pied-piping possessor movement from the complement of such a verb is unacceptable (35a). An equivalent PE configuration is no better (35b):

(35) **No extraction (PE or otherwise) 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*, *suspect*, *tell*, *believe*, *hear*, etc.) are always acceptable 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 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] will get 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 English PE truly involves movement, and not a deceptive parenthetical construction.¹⁸

4 The two mechanisms that constrain English PE

As previewed, this paper argues that the restricted distribution of English PE emerges from the interaction of CL, and an adjacency requirement of [*'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 of certain constituents termed *phases* (including at least vP and CP). In this theory, the phase edge is an escape hatch because it is not subject to phase-level spellout, which targets only the phase head's complement, transferring it to the interfaces of Phonological Form and Logical Form. After spellout, the complement is inaccessible to further syntactic operations. Thus material moving from a phase head's complement

¹⁸Given that some English speakers can extract possessors via A'-movement, it would also be reasonable to expect such speakers to permit possessor raising via A-movement, though this is not in fact possible (v). I hypothesize that because English possessors are always Case-licensed DP-internally, A-movement of possessors from DP is not an option, since English lacks phenomena like hyper-raising.

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

must reach 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 to prevent a moving phrase from being trapped by phase-level spellout. Rather, Fox & Pesetsky argue that successive-cyclic movement through phase edges is motivated by the information-preserving nature of spellout, *Order Preservation*:

- (39) **Order Preservation** (Fox & Pesetsky 2005a, p. 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 previously established ordering information in order to save derivations that end up with a final linearization that is not coherent. Therefore syntax must be able to construct configurations that end up with linearization information that is consistent across all phases in that derivation, since if it does not, a crash at PF is unavoidable. Fox & Pesetsky argue that exiting a phase by moving out via its linear edge is one way to keep linearization information consistent within a derivation:

- (40) **Successive-cyclic movement through linear edge of a phase**
 a. ✓ $[YP \alpha [PhaseP \alpha \beta [XP \alpha]]]$ b. * $[YP \alpha [PhaseP \beta [XP \alpha]]]$

By moving via the linear edge of each phase passed, phase-exiting phrases are determined by PF to precede the rest of 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 movement from a phase doesn't pass through the 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 previously crossed it, thus restoring the original order of those elements, keeps linearization coherent. For instance, (41a) below is ungrammatical 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 in the next phase as it did in the first:

- (41) **Avoiding a linearization problem with order-restoring movement**
 a. * $[PhaseP2 \alpha [PhaseP1 \beta [XP \alpha]]]$ b. ✓ $[PhaseP2 \beta \alpha [PhaseP1 \beta [XP t_\alpha]]]$

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

In the next section, we will see that pressure to obey the scenarios in (40) and (41) restricts PE by interacting with the adjacency requirement of [*'s*], described below.

4.2 Adjacency of ['s] and the possessor

As mentioned previously, several works argue that PE in English is typically prevented by a PF requirement mandating adjacency of the possessor and possessive D ['s] (Chomsky 1995, Radford 1997, Gavrusseva 2000, Gavrusseva & Thornton 2001, a.o.). Indeed, Gavrusseva (2000) argues that a requirement of adjacency to possessive D is influential in blocking PE in many languages. To describe an English grammar that does not allow PE, it will suffice to state the relevant requirement as follows:

(42) **Possessor-['s] Adjacency (Global version)**

For any derivation containing ['s], ['s] must be linearly adjacent¹⁹ 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 at the final PF representation generated by the derivation in question. A grammar with such a constraint will never permit separation of possessor and possessum, as is indeed the case for many English speakers.

However, it is necessary to say something different about the grammar of those speakers who do permit PE. I argue that (constrained) PE is an option for such speakers because they are able to satisfy adjacency to ['s] more locally. In particular, I argue that such speakers can satisfy this requirement in a phase-bounded way, as (43) states:

(43) **Possessor-['s] 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, this adjacency condition is not applicable to those later phases, and the possessor can move on freely. For more discussion about the nature of this adjacency constraint, see section 9.1 and footnotes within.

4.3 The importance of spelling out phase edges

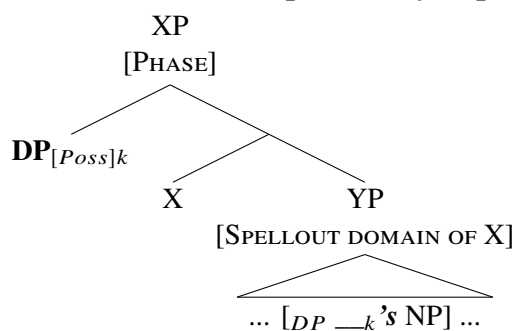
The fact that the CL theory includes phase edges in the spellout domain of phases is critical for this account of English PE. This system allows phase-level spellout and the PF adjacency requirement of ['s] in (43) to interact with successive-cyclic movement through phase edges. As we'll see, this interaction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

The needed 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,

¹⁹I 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 term 'bound morphemes'.

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 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 in (44), the local adjacency requirement of ['s] will not be 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 is avoided if the possessum is pied-piped along with movement of the possessor to the phase edge. 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 incorrectly predict a total lack of PE.²⁰

5 Predicting the facts

This section shows how the concepts explained above predict the details of PE in English, which as we've seen, obeys the following generalization:

- (45) **Generalization about English PE and clause edges** [= (6, 17)]
 A possessor must reach the left linear edge of the local CP before extracting from the possessum DP.

First I discuss PE from 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 concept which will also be relevant to the discussion of expletives later on.

²⁰A 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 achieve the right results.

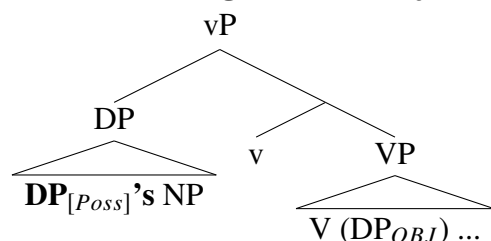
5.1 PE from subjects

This subsection analyzes PE from subjects. We've seen that English PE is only possible for cross-clausal movement, a fact whose explanation will be clear by the end of this section. Given this constraint, the analysis of a PE sentence must begin with the vP of the embedded clause in which the possessor originates. In the case of PE from subjects, this part of the derivation is straightforward, since the interactions most important to this analysis do not fully emerge until the derivation of the embedded CP.

5.1.1 PE from subjects: The embedded vP level

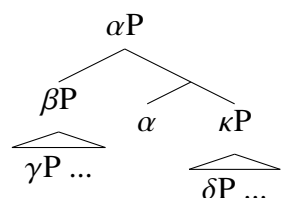
The facts reported in this paper show PE from both external argument and internal argument subjects. Let's first consider what occurs within the embedded vP of a derivation with PE from an external argument. If external arguments originate in spec-vP, as in transitive and unergative contexts, then no successive-cyclic movement is necessary at this stage of the derivation. The in situ external argument and its possessor simply start out at the linear edge of the vP phase, which they will soon exit.

(46) Transitive/unergative vP: Subject and its possessor originate at phase edge



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 2007, 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 in (47), where we see that the head α c-commands its complement κP and all that it contains, but not its specifier βP or any content thereof:

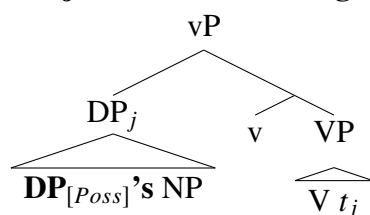
(47) Heads don't c-command their specifiers and can't target them for movement



Thus movement of βP or γP to a higher specifier of αP in (47) is not 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.

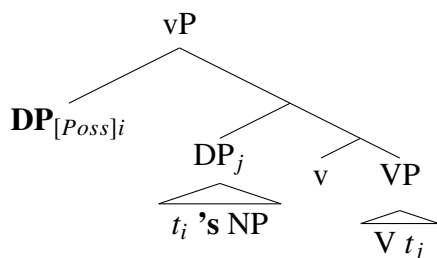
Second, consider the vP derivation involved with PE from a subject that is an internal argument, as in unaccusative and passive contexts. Independent of PE, given that such a subject is externally merged as a complement of V, it must move to spec-vP in order to maintain a coherent linearization under CL: since English V moves to v (Larson 1988, Chomsky 1995, Kratzer 1996, and others), and because the subject ultimately precedes V from its final position in spec-TP, it is necessary for the internal argument subject to move to spec-vP in order to precede V at the spellout of vP. That A-movement of subjects indeed passes through vP edges is independently argued by Sauerland (2003). Notice that such movement of an internal argument subject automatically brings a possessor contained within it to the linear edge of vP, as we see in (48):

(48) **Subject movement to edge of unaccusative/passive vP**



It is also in principle possible for the possessor to extract to the vP edge, with the internal argument 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 passive/unaccusative subject with subject tucking-in**

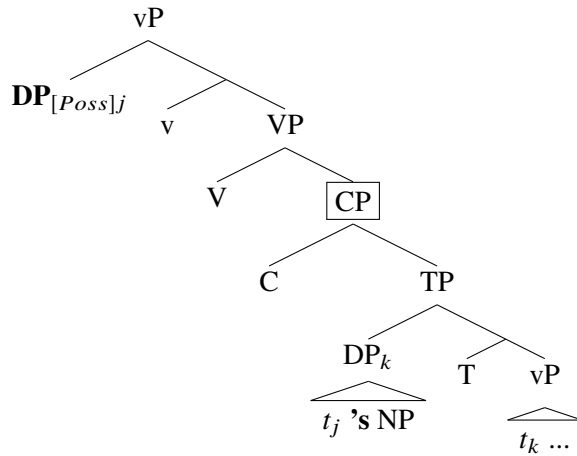


Because the derivation in (48) accomplishes the same thing as (49) but with less movement operations (modulo the different final constituency), we might expect concerns of economy to favor (48).²¹ However, nothing of substance for this paper's account changes if the reality is (49), or if both derivations are available.

This concludes the consideration of the embedded vP phase for derivations with PE from a subject. So far, the adjacency requirement of ['s] has not been critically relevant, since the context where its influence is most evident has not yet arisen. This requirement is much more influential on the derivation of the CP phase, as we'll see next.

²¹Furthermore, the derivation described for (49) may represent an instance of *chain interleaving*, which following Collins (1994), is independently ruled out. If this is so, then on these grounds as well, the derivation in (48) stands as superior.

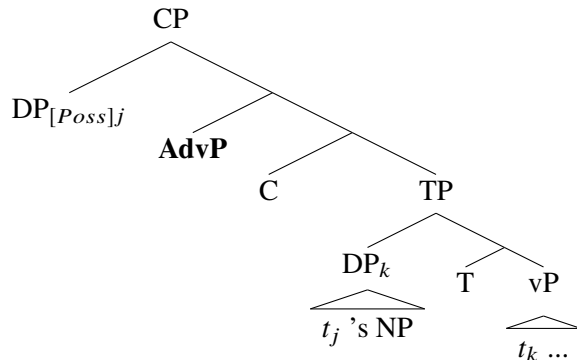
(52) **Successful PE into matrix vP: Possessum stranded in embedded CP**



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

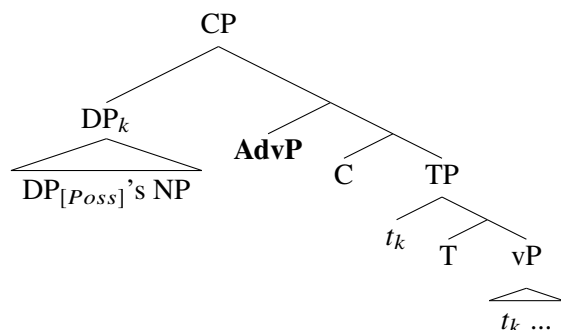
Next, let's examine a PE derivation where there is problematic material in the edge of the CP exited by PE. Consider (53) below, where the embedded CP contains an adverb in the left periphery. CL motivates the possessor to exit this CP via its linear edge. Therefore the possessor must move to a position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

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



While later movement of the possessor from CP in (53) would satisfy CL, there is a problem. When this embedded CP undergoes spellout, PF will find the possessor and [*'s*] 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 with the possessor's movement over the adverb to the edge of CP (54):

(54) **Possessum pied-piping over adverb to the linear edge of CP**



This pied-piping movement satisfies CL as well as the adjacency requirement of [*'s*] within this embedded CP. After (54), the possessor can successfully extract into the matrix vP. In such a derivation we end up with the high adverb to the right of the stranded possessum subject. As we saw in (50a) above, this is indeed 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 *that*, such as (50b) above, will be identical to what we have just seen for the adverb scenario. If CP contains an overt C, the possessor must move to its left, pied-piping the possessum with it to spec-CP 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) showed, an overt C on either side of a subject that PE has exited is impossible.

This concludes the analysis of PE from subjects. The next subsection analyzes the properties of PE from non-subject DPs, which is governed by the very same principles.

5.2 PE from non-subjects

5.2.1 PE from non-subjects: The embedded vP level

Recall that PE from a non-subject DP requires that DP to be pied-piped to the edge of the local CP in English. Consequently, in contrast to more typical PE in a language like Hungarian, English PE cannot strand a non-subject possessum in its base position:

(55) **Non-subject exited by PE must be stranded in a CP edge**

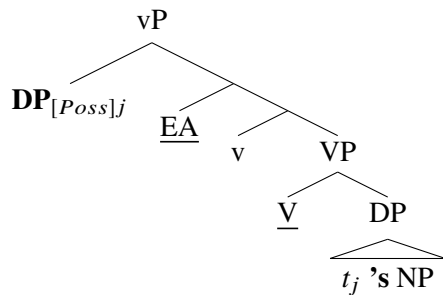
- a. * The person [**who**_j you think [John ate [_j's food]]] is Mary]
- b. ✓ The person [**who**_j you think [[_j's food]_k John ate _k] is Mary]

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 achieved by adjoining the adverb linearly to the right rather than to the left of the subject, but we see here that even if the adverb originates left of the subject, the derivation can converge.

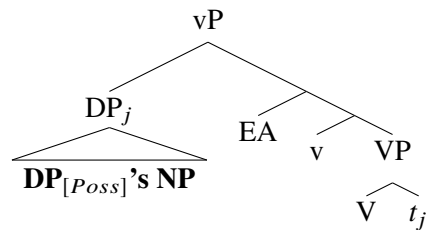
In (56) below we see a transitive vP in which PE has exited a direct object, stranding it in situ in the complement of V. This derivation would be satisfactory for CL, since the moving possessor has reached the linear edge of this phase. However, spellout of this structure will find it to be in violation,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

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



Satisfying CL as well as [*'s*] requires pied-piping the object possessum to the vP edge along with the possessor's movement, instead of stranding it. Consequently, the possessor reaches the phase edge while keeping [*'s*] adjacent, as in (57):

(57) Pied-piping of non-subject possessum with possessor to vP edge



It is now clear 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 non-subject possessum has been pied-piped into the edge of vP, but it cannot remain here, as demonstrated in (58):

(58) Non-subject possessum cannot be stranded in spec-vP by PE

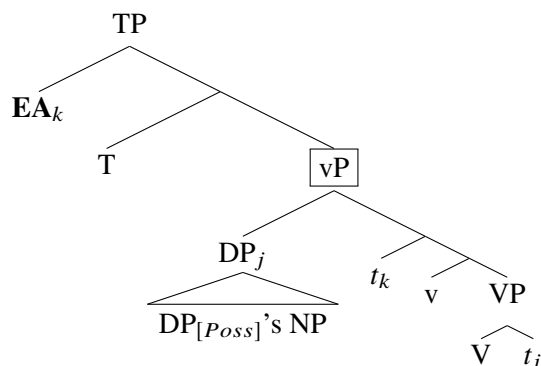
- a. * The person [**who**_j I think [_{CP} they [_{vP} [_{—j}'s **food**]_k ate _{—k}]]] is Mary
- b. * [**Which student**]_j did you say [_{CP} she [_{vP} [_{—j}'s **book**]_k found _{—k}]]?

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 analysis 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 the concepts defended in this paper in fact predict that the non-subject possessum must exit spec-vP, we must consider the next phase of the derivation.

5.2.2 PE from non-subjects: The embedded CP level

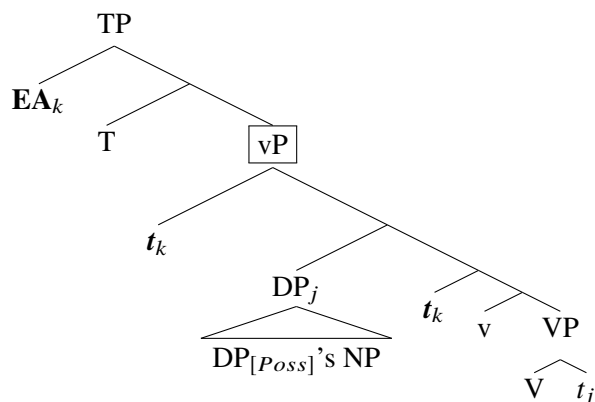
Upon the merge of T, the subject A-moves to spec-TP from its external merge site in spec-vP. This movement carries the subject across the non-subject possessive DP which in (57) above A'-moved to an outer spec-vP, due to pied-piping of the possessum along with the possessor's movement. The result is the structure in (59):

(59) **A-movement of subject to spec-TP across moved possessive DP in vP edge**



Recall that CL motivates elements exiting a phase to pass through that phase's linear edge. For this reason, in principle A-movement of the subject might in fact 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) * **Subject A-movement via higher spec-vP above pied-piped possessum**



Thus we expect the only possibility to be the derivation in (59), where the subject reaches spec-TP by non-successive-cyclically moving across the possessive DP occupying the linear edge of vP. The derivation in (60) would end up problematic for linearization anyway: here the subject would precede the possessor at the spellout of vP, but the possessor will ultimately extract and move to spec-CP, and thus precede the subject. Since in this situation the relative order of possessor and subject is not consistent across both phases, a linearization contradiction will arise. In contrast, the derivation in (59) avoids this linearization problem, since here the possessor precedes the subject within vP, just as will be the case post-PE.

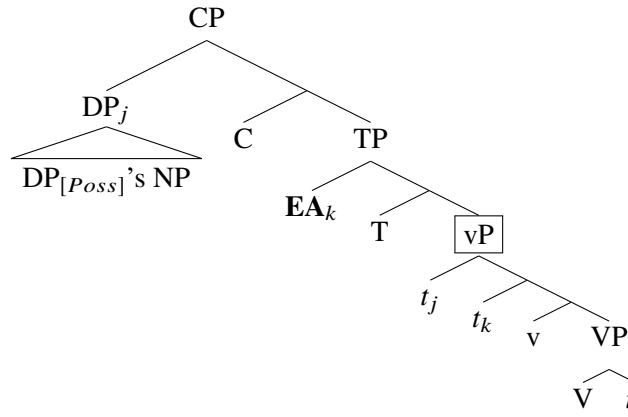
As mentioned in subsection 4.1, CL makes a prediction about how to permit non-successive-cyclic phase exits, which don't pass through the linear edge of the phase. In these scenarios, the material crossed over by movement from a non-edge position in the phase must also move into the next phase, to a position preceding what previously crossed it. This movement ensures the coherence of the linearization information of both phases involved, as (61) shows once more:

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

- a. * $[_{PhaseP2} \alpha [_{PhaseP1} \beta [_{XP} \alpha]]]$ b. ✓ $[_{PhaseP2} \beta \alpha [_{PhaseP1} \beta [_{XP} t_\alpha]]]$

Given this prediction, if the A'-moved possessive DP in spec-vP must be non-successive-cyclically crossed by A-movement of the subject as in (59), then we expect that the possessum will be unable to 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 the edge of the embedded CP, which as we see in (62), maintains a coherent linearization:

(62) **Non-subject possessum must be 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 ...

The present account thus correctly predicts that non-subject possessum DPs must be pied-piped to the embedded spec-CP when exited by PE. While in principle non-subject possessum stranding in spec-vP should be licit, the interaction of CL with A-movement of the subject forces additional pied-piping to CP.

After pied-piping the non-subject possessum to the edge of the embedded CP (62), the possessor can move on freely, as we saw in (52) above. Nothing forces further pied-piping, as the facts have shown. The possessor extracts on into the matrix clause, with ['s] remaining stranded below in the lower CP phase.

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

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

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

Who_j did you say [_{CP} (*that) [_{__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 concepts under discussion yield familiar explanations for this constraint. To satisfy CL, the possessor must move to a spec-CP above any peripheral material separating it from the linear edge of CP before moving on. In scenarios like (63), this involves the possessor moving from the containing non-subject possessum that was previously pied-piped into CP in order to precede the subject. This would be movement of the possessor from one specifier to another within the same CP, which is independently ruled out (see 5.1.1), in addition to the fact that this would render the possessor and [_{'s}] illegally non-adjacent within CP (see 5.1.2). Thus the only option is for the possessor to not move within CP, but later non-successive-cyclically cross over the problematic peripheral material when moving into the matrix vP, thus violating CL.

Finally, if there are multiple embedded CPs, the possessum can be stranded at any CP edge in the possessor's movement path, as long as the above requirements are met:

(64) **PE with multiple embedding: Possessum stranding in any CP edge**²³

a. **Who_k** do you think [_{CP}([_{__k}'s cat]) he said [_{CP}([_{__k}'s cat]) is cute]]?

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

5.3 Why English PE requires cross-clausal movement

Recall that English PE is impossible for A'-movement that is not cross-clausal:

(65) **No PE with clause-internal movement**

a. * **Who_k** will [_{__k}'s article] be published next year?

b. * **Who_k** did they criticize [_{__k}'s article]?

Given that non-subject possessum DPs 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}]

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.

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 clause-internal PE from subjects violates adjacency**
 * [_{CP} **Who**_k will(C-T_j) [_{TP} [_{DP} ____k's kid] t_j win the contest]]?

Thus the concepts defended in this paper correctly derive the fact that English PE cannot become apparent unless movement of the possessor crosses a clause boundary. Consequently, such PE cannot be surface-evident with clause-bound movement.

This concludes the core analysis of English PE. The next section discusses some general consequences of this analysis, before moving on to several extensions.

6 General consequences

6.1 In support of CL

The CL theory is vital to the account provided here, because of its inclusion of phase edges in spellout domains. This feature of CL allows successive-cyclic movement through phase edges to interact with the adjacency requirement of [*'s*], which is enforced at spellout. I have shown 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.

This paper has argued that these facts emerge from just two principles, one language-specific and one general. This paper proposes that CL is an aspect of UG, automatically possessed by all speakers. Having CL intrinsically, the only thing English speakers must learn in order 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. Thus if correct, this analysis entails that CL is a part 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). We have seen 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 from that phase, then that crossed-over material must also move, to a position above what crossed it:

- (67) **Repairing a potential linearization problem**
 a. * [_{PhaseP2} α [_{PhaseP1} β [_{XP} α]]] b. ✓ [_{PhaseP2} β α [_{PhaseP1} β [_{XP} t_α]]]

In the approach to phases in Chomsky (2000, 2001), 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, though this is an automatic consequence of the CL approach.²⁴ In section 8, I'll examine further facts that also support this prediction of CL.

6.2 The non-phasehood of DP

While it is often assumed that DP is a phase, this account of English PE is not compatible with such a claim. I have proposed that the adjacency requirement 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 at spellout. If DP were a phase in of itself, this requirement of [*'s*] would be immediately satisfied within DP. In this situation, there would be no requirement to ever pied-pipe under PE, which incorrectly predicts the possibility of allowing a non-subject possessum exited by PE to remain in situ in VP.

The strongest conclusion to draw from this result is that the English DP is not a phase. This is superficially in agreement with Matushansky (2005), who argues that the phasehood of DP is 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 following Embick & Marantz (2008), among others), but not above them.²⁵

Like the present paper, Sabbagh (2007) and Zyman (2019) must also exclude DP from the set of phases. Such research may be compatible with a theory in which the English DP is a phase for Logical Form, but not Phonological Form (entailing that 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 transfer.

A phenomenon that may provide an independent diagnostic for DP phasehood is the stranding of adjuncts like *exactly/precisely* under *wh*-movement (Urban 1999, a.o.). Such adjuncts can be stranded in their base position,²⁶ or in an intermediate CP edge:

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

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

If DP is a phase, and thus a constituent that movement must exit via the edge of, then such stranding should be possible in the edge of DP. However, as Zyman (2019) observes, this appears not to be the case (69). 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]?

²⁴Bošković (2016) offers a modification of phase theory in which, modulo traces, it is only possible to access the outermost constituent of a phase that has multiple specifiers. This approach makes similar predictions to CL for movement from multi-specifier phases, but because it does not obviously capture the fact that the distribution of English PE is fundamentally constrained by concerns of linear order, I do not explore it 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 generally incompatible with this paper's results.

²⁶Zyman (2019) argues that adjuncts like *exactly* actually cannot be stranded VP-internally, despite appearances, though this doesn't affect the present analysis.

7 A possessor extraction analysis of *that's*-relatives

This section examines an additional configuration that can be analyzed as involving PE, which I'll refer to as the *that's*-relative (Seppänen & Kjellmer 1995, McDaniel et al 1998, 2002). This relativization strategy, available to many (though not all) English speakers, 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 house [**that's** door is blue]
- c. This is the dog [**that's** food the cat ate]
- d. That is the bike [**that's** wheel the kids broke]

The concepts defended in this paper so far lead to an account of this construction with the addition of a 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 English,²⁷ 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 concept 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 a special instance of *that* which is a relative pronoun / relativizing *wh*-operator. The exact position occupied by *that* in this construction is not obvious based on the surface string, but if *that* really can be a relative pronoun, then it should be able to take the place of the typical *wh*-operator when relativization involves a pied-piped P, for instance. This turns out to be impossible, as we see below:

(71) *that* is not a 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/*that**] I traveled]
- d. This is the office [[to **which/*that**] I sent a package]

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 debatable issue, under Deal's analysis, this fact suggests a TP phase in cleft clauses also. The presence of a TP phase in cleft clauses accurately predicts the availability of a *that's*-relative-like structure in clefts (*It's John **that's** family loves dogs*) under the analysis of this section.

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 *wh*-operator moves to spec-CP:²⁸

(72) ***that*'s-relative (with operator movement from a subject possessum)**

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

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 that English PE can occur with all types of A'-movement, including relativization, provided that such movement strands the possessum at the edge of an embedded CP. Section 5 argued that this is so because CL and the adjacency condition of [*'s*] together prevent PE from occurring until the possessum can be stranded in a phase edge. As we've seen, independent factors prevent the possessum from occupying the vP edge, thus it always surfaces in an embedded CP edge in the PE derivations shown so far:

(73) **Typical PE in relative clauses with possessum stranding in CP edge**

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

If TP is a phase in relative clauses, then such clauses should allow a second possibility for PE derivations: instead of the possessum following the moving possessor until reaching a CP edge as in (73), the possessum could also be stranded in the edge of the phasal TP, below C. Such a derivation produces a *that*'s-relative. In the case of a *that*'s-relative with a gap inside of a subject possessum, the possessor *wh*-operator simply exits the subject, which remains in spec-TP, as already diagrammed in (72) above. In a *that*'s-relative with a gap in a non-subject possessum, this possessum is pied-piped above the subject to an outer specifier at the edge of the TP phase, with the *wh*-operator subsequently extracting to spec-CP:

(74) ***that*'s-relative (with operator movement from a non-subject possessum)**

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

Notice that in *that*'s-relatives, the relativizing *wh*-operator that moves from possessor position is null. Since an overt C *that* is present in such configurations, we indeed expect the *wh*-operator to be null, given the Doubly Filled Comp Filter. If the Doubly Filled Comp Filter is resolved in the opposite way in such a structure, realizing the possessor operator but keeping the complementizer silent, then the possessor and the possessum will simply appear linearly adjacent as they do in typical relative clauses:²⁹

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.

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 must leave this puzzle aside for the time being.

(75) **Alternative resolution of the Doubly Filled Comp Filter**

- 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)

To conclude this section, note that this analysis of *that*'s-relatives maintains the phase-bounded adjacency requirement of ['s] that I've argued generally constrains English PE (43). This requirement's interaction with CL forces PE to strand the possessum in the linear edge of a phase crossed by the possessor's movement. Ultimately this is the CP edge in the cases examined earlier in this 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.

8 On stranding in spec-vP

The analysis of English PE argued for 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 (2019) for a more thorough cross-linguistic consideration of stranding in phase edges.

8.1 Predicting the distribution of stranding in spec-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 argues that such intermediate *wh*-associated *all* stranding provides 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 demonstrating this fact 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]]?

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. 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) above. A reviewer also points out that the Doubly Filled Comp Filter fails to apply in the matrix CP of a *wh*-question, where C is filled by an auxiliary (*What will John buy?*). Evidently, the Doubly Filled Comp Filter is only applicable to the complementizer *that*, and not in all situations. These facts indeed raise intriguing questions about the nature of the Doubly Filled Comp Filter, but are tangential to the analysis of the PE facts that this paper focuses on.

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

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 above. 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 cannot co-occur with stranding in spec-vP**

$[_{CP} wh_k [_{TP} T \dots [_{vP} t_k (*all) SUBJ v V t_k]]]$

The second reason *wh*-associated *all* stranding is banned in spec-vP relates to head movement. Recall that McCloskey argues that V moves from 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 the edge of vP, preventing stranding there:

(79) **V movement from vP cannot co-occur with stranding in spec-vP**

$[_{CP} wh_k \dots [_{XP} X \dots [_{vP} t_k (*all) v V t_k]]]$

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 here, since Korean is a head-final language:

(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 string is possible in Japanese, which has the same basic syntactic 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'

Convergent evidence for the concepts under discussion comes from the stranding of adjuncts like *exactly/precisely* under *wh*-movement. Such adjuncts can be stranded in their base position, or in a CP edge, as (68) above showed. This account of English PE predicts that A-movement of the subject will prevent such adjuncts from being stranded in spec-vP. This prediction appears accurate: examples like (82) below only have an odd reading construing *exactly* as an adverb of vP/VP, rather than as a modifier of DP:

- (82) * ***exactly*-stranding in spec-vP**
 [_{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)]]

This adjunct cannot be stranded in spec-vP, as (84) shows. Since unlike *exactly* this adjunct can't be construed as a modifier of vP/VP, this judgment is clearer than that of (82).

- (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 Micronesian 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 to precede V (see section 5.1.1). From that position, A-movement to spec-TP crosses anything stranded in the periphery of vP by A'-movement, causing a linearization problem.

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.

8.2 Diagnosing the origination of expletive *there*

Section 2 demonstrated that expletive associates exited by PE must be pied-piped to the edge of the local CP, just as all non-subject DPs must, as repeated in (87):

- (87) **PE from expletive associate** [from (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 _{__k} on the table]?

This possessum stranding can be used as a diagnostic for the derivational history of the expletive. 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) above 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. For this reason (88) below adds an auxiliary in order to keep V 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 be stranded in spec-CP (not spec-vP) 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, as discussed in section 8.1, is also not possible in expletive constructions:

- (89) **No adjunct stranding in spec-vP in expletive constructions**
- a. [How many kids]_k have there [_{vP} _{__k} (***exactly**) been _{__k} in the office today]?
 - b. [How many kilos of gold]_k (to the nearest hundred) have there [_{vP} _{__k} (***to the nearest hundred**) been _{__k} 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 phrase's edge. Thus evidence for vP phasehood in this environment is necessary. Nissenbaum (2000) argues that parasitic gaps in clausal adjuncts are licensed by successive-cyclic movement through spec-vP. If such a parasitic gap can be licensed in a given environment, it thus 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 parasitic gap licensing:

- (90) **Parasitic gaps in expletive constructions**
- a. Who_k was there a big rumor about _{__k} [after the police arrested _{__PG}]?

- b. Who_k was there a party for ____k [before the boss promoted ____{PG}]?

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 has described and analyzed the complexities of PE in English, a little-studied possibility for many speakers. I have argued that English PE provides evidence for CL, which constrains English PE via its interaction with a phase-level version of an independently proposed PF requirement of [*'s*]. I have additionally argued that this analysis entails the non-phasehood of DP, sheds light on the derivation of *that's*-relatives (and the phasehood of TP in relative clauses), reveals some linearization constraints on stranding, and suggests that expletive *there* originates in vP.

9.1 On the adjacency condition of [*'s*]

Following works proposing that PE in mainstream English is banned because the possessive D [*'s*] must be adjacent to the possessor at PF, this paper hypothesized that the constrained nature of English PE emerges when speakers allow such a requirement to be enforced within a structurally smaller domain. Namely, I hypothesized that while this constraint is globally enforced in English grammars without PE (42), those speakers with PE can satisfy this constraint at the minimal phase level (43).

If such adjacency constraints can generally be locally evaluated in this way, we expect to see phenomena in other languages whose distribution is analogous to that of English PE: that is, we expect to find circumstances where something like a bound morpheme can only be stranded after some movement. At the time of writing, I have not found additional facts that obviously fit this description. If such patterns are not clearly attested, it may be that the English pattern studied here is atypical and therefore perhaps unstable. If this is so, we may expect subsequent generations to re-arrange, or fail to acquire, the patterns reported here.

Provided that this paper's arguments for this adjacency requirement of [*'s*] 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 CL being the main one) will be preserved independent of what concepts are ultimately brought to bear on this requirement's explanation.³³

³³Adjacency between [*'s*] and the possessor it selects can be motivated by Richards' (2016) *contiguity theory*, which hypothesizes that syntactic dependencies like agreement and selection require linear adjacency of the elements involved in many cases, due to prosodic requirements. Importantly, Richards' (2016) allows such adjacency to be satisfied derivationally, and later broken. While this concept is reminiscent of this paper's conclusion that speakers with PE permit extraction of the possessor after earlier satisfaction of adjacency, it does not explain why such eventual breaking of adjacency is available to only some speakers.

It is possible that grammars differ in how the relevant adjacency requirement is prioritized. This hypothesis can be implemented using the alignment constraints of Optimality Theoretic phonology (McCarthy & Prince 1993, a.o.). In Optimality Theory, all constraints are in principle violable, depending on how they are ranked

10 Appendix: Against a topic/focus movement analysis of possessum displacement

In section 2, following Gavrusseva & Thornton (2001) I adopted the hypothesis 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 possible for many English speakers. Since it is only vital to this paper's analysis that the possessum reaches the embedded CP edge, either of these accounts could achieve correct results. Thus this choice does not affect the central findings of this paper. However, there are reasons to believe that a topic/focus movement analysis is not correct.

For speakers with PE that independently accept 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. Speakers who accept (91a) and allow PE report that such information structure is absent from PE sentences with a displaced non-subject like (91b). Rather, such PE examples have a neutral information structure (modulo question-hood), just like their full pied-piping equivalents do (91c).³⁴ Furthermore, some speakers I have interviewed do not readily accept topic/focus movement in the spoken language (and thus do not accept examples like (91a) below) but nevertheless accept PE examples like (91b). For such speakers, it is especially clear that PE and topic/focus movement are unrelated.

- (91) a. **Topic/focus movement**
[John's cake]_k, you said they really liked ____k
- b. **PE from non-subject**
Who_j did you say [[___j's cake]_k they really liked ____k]?
- c. **Pied-piping equivalent of (91b)**
[Whose cake]_k did you say [they really liked ____k]?

relative to each other. For speakers without PE, the hypothesis would thus be that adjacency of the possessor and [*'s*] is enforced by a highly ranked constraint, which is never violated. In contrast, speakers with PE possess a colloquial grammar in which this adjacency constraint is violable, though not utterly, since it must be satisfied for a minimal part of the derivation. Allowing adjacency to be broken only after some minimal satisfaction is also evocative of Richards' (1988) Principle of Minimal Compliance. However, if this adjacency requirement is in principle violable depending on language-internal constraint ranking, 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 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?

³⁴The prosody typical of topic/focus movement is also absent from examples like (91b).

If the topic/focus movement analysis is incorrect, the relevant sentences with PE from a non-subject should be accepted even with matrix verbs that ban embedded topicalization. Hooper & Thompson (1973) show that non-factive verbs like *doubt* and *deny* ban embedded topicalization (among other ‘root transformations’ like VP fronting). In fact, such matrix verbs indeed degrade PE, as (92) shows by comparing a deviant sentence with PE from a non-subject (92a) with its pied-piping equivalent (92b).

(92) **PE is blocked by non-factive verbs**

- 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]?

However, if the unavailability of topic/focus movement were the problem in (92a), then such an example should be permitted when the matrix verb is factive, like *realize*, *know*, *see*, embedding verbs which Hooper & Thompson show allow embedded topicalization. Importantly, PE with such factive embedding verbs also fails:

(93) **PE is blocked by factive verbs**

- 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 island inducers (see Szabolcsi and Lohndal (2017) for a recent overview). This set also includes *wh*-islands caused by *whether*, which interfere with PE as well:

(94) **PE is sensitive to the *whether* island**

- 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]?

NPI licensors 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.³⁵

(95) **PE is degraded by NPI licensors**

- 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]]

³⁵Examples (95b/d) are best with focus on the intervener. Focus, among other semantic and pragmatic factors, is known to circumvent the (weak) island-hood of negation and related elements (Kroch 1989, Kuno & Takami 1997, a.o.).

Overall, the hypothesis that PE (from non-subjects) depends on topic/focus movement fails to predict the actual set of circumstances where English PE is degraded, which fits the set of weak islands. English PE is in essence an instance of left branch extraction (Ross 1967), a type of extraction that is known to be sensitive to weak islands in several other western European languages. For instance, *combien*-split in French (Obenauer 1984) and *wat voor / wat aan*-split in Dutch (Corver 1990, Beermann 1997, Honcoop 1998) are subject to the same constraint. Thus the weak island sensitivity of English PE falls within the purview of known constraints on extraction of this variety.

11 References

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