Crossing and Stranding at Edges[*]

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Abstract This paper examines the distribution of stranding in phase edges under A′-movement. I argue that the restrictions on this phenomenon provide evidence for the Cyclic Linearization theory of spellout, and a theory of movement as contingent on c-command-constrained Agree, which restricts movement in phrase edges. I show that these claims accurately predict a cross-linguistic word order generalization about stranding in intermediate positions, and provide insight into when a given position is viable for stranding or not. I go on to consider some extra-syntactic factors that further constrain stranding.

1 Introduction

Moving constituents can sometimes leave material behind at intermediate points in the sentence. If the syntactic derivation is constrained by *phases* (Chomsky 2000, 2001, inter alia), and movement paths must successive-cyclically pause in the edge of each phase passed, then such patterns of *intermediate stranding* (IS) are something that we expect to see—the intermediate landing sites forced by phases create positions where, in principle, moving phrases might leave something behind. In this paper, I examine the distribution of such stranding under A′-movement.

The schema in (1) illustrates the basic form of such derivations. Here α successive-cyclically A′-moves in two steps, pied-piping β to the edge of the YP phase with the first step of movement, subsequently stranding β at the YP edge with the second movement step. Thus successive-cyclic movement of α feeds IS of β.

(1) **A schema for IS**

$[_{ZP}\ \alpha\ [_{YP[Phase]}\ \alpha\beta\ [_{XP}\ \alpha\beta\ ]]]$
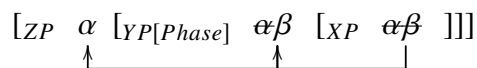
I'll show that IS under A′-movement follows a cross-linguistic generalization about word order, stated in (2).

(2) **Intermediate Stranding Generalization**
IS is only possible when the stranded material is, or can be, to the right of the material that continues to move leftward

I argue that (2) suggests a particular understanding of the locality conditions on movement operations, and of the nature of phasal spellout.

1.1 Conclusions in preview

Assuming that IS occurs in phase edges for the reasons outlined above, I argue that (2) holds because IS derivations that don't adhere to (2) encounter a crossing problem: IS of an element that precedes the phrase that strands it requires the phrase that moves on to cross over what it strands at the edge, in a way that I'll argue is illicit.

This crossing problem is illustrated in (3) below. In (3a), β precedes α before movement. In order for successive-cyclic movement of α to strand β in the edge of the YP phase, α must cross over β when β is stranded there. In contrast, in (3b) α precedes β before movement. Thus movement of α will not cross over β when β is stranded at the YP edge.

(3) a. ***Crossing at the edge** b. **No crossing at the edge**

$[_{ZP} \; \alpha \; [_{YP[Phase]} \; \beta\alpha \; [_{XP} \; \beta\alpha \;]]]$ $[_{ZP} \; \alpha \; [_{YP[Phase]} \; \alpha\beta \; [_{XP} \; \alpha\beta \;]]]$

In this paper I argue for a theory which ensures that only non-crossing IS derivations like (3b) succeed, thus deriving (2) as a theorem of more general principles.

I argue that the combination of two concepts in syntactic theory derives (2). The first is the *Cyclic Linearization* (CL) theory of spellout (Fox & Pesetsky (2003, 2005a,b); Podobryaev (2009); Sabbagh (2007); Ko (2007, 2011, 2014)). CL derives successive-cyclic movement (and certain exceptions to it) from the logic of non-contradiction in *linearization*, the phase-by-phase mapping of syntactic structures to pronounceable linear strings at spellout. The second concept is a theory of movement as parasitic on Agree (Chomsky (1995, 2001); Ko (2014); van Urk (2015)), which predicts constraints on movement within phrase edges, preventing certain exceptions to (2) that CL alone does not rule out.

1.2 Roadmap

Section 2 provides more background on IS, and supports the generalization proposed in (2) above. Section 3 outlines and compares the predictions of the theory of spellout in Chomsky (2000, 2001) versus CL. Section 4 argues for the importance of Agree-driven movement, and addresses other locality constraints on movement. Section 5 examines the predictions for when an edge is licit for stranding or not. Section 6 addresses some extra-syntactic constraints on stranding. Some further issues and extensions are discussed in the appendix.

2 Examining IS cross-linguistically

2.1 West Ulster English and an old puzzle

I open the examination of IS with a pre-existing puzzle in the literature, which presents a contrast that cuts right to the heart of the issues that will be in focus in this paper.

McCloskey (2000) discusses what is likely the most well-known case of IS, involving the strandable postnominal quantifier *all* in West Ulster English. In this variety of English,

A′-movement can strand *all* both in its base position and in intermediate points in the sentence:[1]

(4) **West Ulster *all*-stranding** (McCloskey 2000, ex. 8)
What$_k$ (all) did he say [$_{CP}$ t_k **(all)** (that) he wanted t_k (all)]

McCloskey argues that such facts provide evidence that A′-movement successive-cyclically passes through the edge of CP. Decades earlier, Postal (1972, 1974) made the inverse argument, based on the fact that English prepositions cannot be stranded at clause edges:

(5) **No IS of English prepositions**
(In) [whose pants]$_k$ did you say [$_{CP}$ **(*in)** t_k (that) I put eels (in) t_k]?

Postal argues that if movement is really successive-cyclic, preposition stranding should be possible at the intermediate landing sites of such movement. The facts instantiated in (4) and (5), and the theories they suggest, are clearly in tension. If long-distance A′-movement is not successive cyclic, what allows (4), and if it is, what is the problem in (5)? I argue that the problem in (5) has to do with word order.

Notice that prepositions, which can't be intermediately stranded, precede the *wh*-phrase they attach to. However, the West Ulster Englsh strandable *all* follows the *wh*-phrase, and can be intermediately stranded. This word order contrast parallels the schema in (3), and thus fits the generalization in (2).

(6) a. **IS impossible** b. **IS possible**
<u>In</u> which hovercraft What <u>all</u>

This paper will maintain the successive-cyclic nature of A′-movement, and argue that the above restrictions stem from a linearization problem. The rest of this subsection overviews IS patterns from several other languages, which all fit (2).

2.2 Afrikaans postpositions

du Plessis (1977) discusses P stranding in Afrikaans, reporting what is probably the first instance of IS in the literature. du Plessis shows that *wh*-movement must pied-pipe prepositions in Afrikaans:

(7) a. **No preposition stranding in Afrikaans[2]** (du Plessis 1977, p. 724)

Vir wat$_k$ werk ons nou eintlik t_k?
For what work we now actually?

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[1]Standard English has the same *all*, but cannot strand it under A′-movement. This is an independent puzzle that I won't address in this paper, though McCloskey suggests that prosodic differences between the two English varieties can account for this difference.

[2]There are details about the form of the *wh*-phrases in question, such as *wat* versus *waar*, which pattern with the facts about stranding but aren't relevant to the basic word order facts that I'm concerned with here.

'For what do we actually work?'

b. * **Waar**$_k$ werk ons nou eintlik **vir** t_k?
What work we now actually for?
'For what do we actually work?'

Afrikaans also has postpositional adpositions like *-voor* ('for') and *-oor* ('about'), which compound onto the preceding nominal.[3] Unlike prepositions, postpositions can be stranded in their base position, as well as in clause edges, as (8) shows:[4]

(8) **Afrikaans postposition stranding**   (Adapted from du Plessis 1977, ex. 5, 12-13)

a. Waar$_k$(voor) dink julle [$_{CP}$ t_k **(voor)** werk ons t_k (voor)]?
where(for) think you [(for) work we   (for)]?
'For what do you think that we work?'

b. Wat/waar$_k$ dink julle dink die bure   [$_{CP}$ t_k **(oor)**   stry   ons t_k
What   think you think the neighbors [(about) argue we
(oor)]?
(about)]?
'What do you think the neighbors think we are arguing about?'

As we saw for West Ulster English, the elements that can undergo IS in Afrikaans are, as postpositions, attached to the right of what strands them by leftward movement.

2.3   Polish left branch extraction

Wiland (2010) analyzes stranding under *wh*-movement in Polish. Polish *wh*-movement permits pied-piping of the entire nominal phrase containing a *wh*-element (9), as well as left branch extraction the minimal *wh*-element, stranding NP below (10).

(9) **Polish pied-piping *wh*-movement**   (Wiland 2010, ex. 1)

[**Jaki samochód**]$_k$ Paweł kupił   swojej żonie t_k?
[What car]   Pawel bought his   wife?

'What car did Pawel buy his wife?'

(10) **Polish left branch extracting *wh*-movement**   (Wiland 2010, ex. 2)

Jaki$_k$ Paweł kupił   swojej żonie [t_k **samochód**]
What Pawel bought his   wife [car]?

'What car did Pawel buy his wife?'

This left branch extraction can strand NP at various intermediate points in the sentence:

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[3] The nominals that appear in this circumstance are *R-pronouns*, in the terms of van Riemsdijk (1978).
[4] For other restrictions on IS in Afrikaans see Rackowski & Richards (2005).

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(11) **IS of NP under left branch extraction in Polish** (Wiland 2010, ex. 3-5)

  a. **IS in spec-VP**

  Jaki$_k$ Paweł kupił [t_k **samochód**]$_j$ swojej żonie t_j
  What Pawel bought [car]   his   wife?

  'What car did Pawel buy his wife?'

  b. **IS in spec-vP**

  Jaki$_k$ Paweł [t_k **samochód**]$_j$ kupił swojej żonie t_j
  What Pawel [car]   bought his   wife?

  'What car did Pawel buy his wife?'

  c. **IS in spec-CP**

  $^?$**Jaki**$_k$ *pro* myślisz [t_k **samochód**]$_j$ (*że) Paweł kupił swojej żonie t_j
  What (you) think [car]   (*that) Pawel bought his   wife?

  'What car do you think that Pawel bought his wife?'

Wiland argues that the facts in (11) do not have the character of scrambling in Polish, and therefore are derived by stranding under successive-cyclic *wh*-movement.[5] Notice that the *wh*-element which is left branch extracted from NP starts out to the left of the NP that it strands (hence the term 'left branch' extraction). Thus this IS scenario also fits (2).

2.4 Korean and Japanese numeral quantifiers

Japanese and Korean numeral quantifiers, which can occur on either side of NP, can be stranded by scrambling. Ko (2011) shows for Korean that object scrambling to the edge of the clause, leaving the subject in situ, can strand a numeral quantifier in spec-vP:

(12) **IS of numeral quantifier by object scrambling in Korean** (Ko 2011, ex. 24)

  Kong-ul$_k$ amato   [$_{vP}$ [t_k **sey-kay**]$_j$ haksayng-tul-i t_j patassulkesita]
  Ball-ACC probably   3-thing student-PL-NOM received

  'The students probably received three balls'

The same possibility holds for Japanese, whose syntax is highly similar:[6]

(13) **IS of numeral quantifier by object scrambling in Japanese**

  Neko-o$_k$ osoraku [$_{vP}$ [t_k **san-biki**]$_j$ gakusei-ga umaku t_j mitsuketa]
  cat-ACC probably   3-CL   student-NOM skillfully found

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[5]In section 6 I will argue that some of these examples may involve a scrambling derivation.

[6]In (13) the inclusion of the adverb *umaku* is intended to rule out a derivation with VP fronting after verb movement out of VP, followed by scrambling of the object. Miyagawa (2017) shows that the adverb *umaku* adjoins at about the VP level, and in (13) we see that *umaku* sits in its base position. The fact that *umaku* was not carried along by any of the movement operations in (13) suggests that the VP was not fronted.

'The students probably skillfully found 3 cats' (P.c. Takashi Morita)

These instances of IS also fit (2), since these strandable numeral quantifiers are able to be attached on the right side of a leftward scrambling NP.

2.5 Russian ambivalent adpositions

Podobryaev (2009) shows that prepositions in Russian can't be stranded by *wh*-movement:

(14) **No preposition stranding in Russian** (Podobryaev 2009, ex. 1)

    a. **O**   **čem**$_k$ ty govoriš t_k?
       About what you talk?
       'About what are you talking?'

    b. ***Čem**$_k$ ty govoriš **o** t_k?
       What you talk   about?
       'About what are you talking?'

In addition to pure prepositions, Russian also has what Podobryaev terms 'ambivalent Ps' which can either follow or precede their complement NP:

(15) **Variable word order of ambivalent Ps** (Podobryaev 2009, ex. 15-16)

    a. **navstreču** Pete
       towards   Petya

    b. Pete **navstreču**
       Petya towards

    c. **nazlo** tebe
       to.spite you

    d. tebe **nazlo**
       you to.spite

Podobryaev shows that these ambivalent Ps may be stranded, unlike prepositions:

(16) **Pied-piping and stranding of ambivalent Ps** (Podobryaev 2009, ex. 18-19)

    a. (Navstreču) **komu**$_k$ (navstreču) ty bežal t_k (**navstreču**)?
       (Towards) whom (towards) you ran   (towards)?
       'Towards whom did you run?'

    b. (Nazlo) **komu**$_k$ (nazlo) ty èto sdelal t_k (**nazlo**)?
       (To.spite) who   (to.spite) you this did   (to.spite)?
       'To spite whom have you done it?'

IS of these ambivalent Ps is also possible:[7]

(17) **IS of ambivalent Ps**   (P.c. Tanya Bondarenko, Anton Kukhto, Mitya Privoznov)

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[7]This observation was made by Tanya Bondarenko, who with Mitya Privoznov confirmed that such sentences are possible, though subject to inter-speaker variation. The examples in (17) use a subjunctive embedded clause because these are easier to extract from in Russian (Bailyn (2012)). Younger speakers who permit extraction from finite clauses (most notably, those with the C *čto*) allow similar IS examples with embedded finite clauses.

a. $^?$Komu$_j$ Vasja xotel [t_j **navstreču**]$_k$ čtoby Petja nobežal t_k ?
   Who   Vasya want   towards   that Petja run
   'Toward whom did Vasya want that Petja would run?'

b. $^?$Komu$_j$ Lena xotela [t_j **nazlo**   ]$_k$ čtoby Maša   pobedila t_k ?
   Who   Lena wanted   to.spite   that Masha win
   'In spite of whom did Lena want that Masha would win?'

In (17) above we see the adposition stranded by *wh*-movement in a position preceding the embedded C. If the complement of the adposition does not undergo A′-movement, moving the adposition to this intermediate position is possible, as in (18), but requires that the moved adposition is interpreted as focused, unlike (17).

(18) **Non-pied-piping adposition movement** (P.c. Tanya Bondarenko, Anton Kukhto)
   a. Vasja xotel **navstreču**$_k$ čtoby Petja nobežal Maše t_k ?
      Vasya want towards   that Petja ran   Masha
      'Vasya wanted that Petja would run <u>towards</u> Masha (not any other direction)'

   b. Lena xotela **nazlo**$_k$ čtoby Maša   pobedila Naste t_k ?
      Lena wanted to.spite that   Masha win   Nastya.DAT
      'Lena wanted that Masha would win <u>in spite of</u> Nastya (not for her benefit)'

I argue that (17) shows true IS under A′-movement, whereas (18) involves scrambling of the adposition, resulting in corresponding effects on information structure.

If these facts are accurate, in Russian we find another instance of IS that fits the generalization: These ambivalent adpositions are able to be to the right of what strands them in an intermediate position.

2.6   English DP adjunct stranding

McCloskey (2000) discusses a pattern in English involving adjuncts like *precisely/exactly*, which he credits to Urban (1999). These DP adjuncts can precede or follow DP:

(19) **Variable order DP adjuncts**
     (**Exactly/precisely**) ten trips (**exactly/precisely**) were made to Antarctica last year.

These adjuncts of DP can be stranded by A′-movement in their base position, as well as at CP edges, as (21) shows:[8][9]

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[8]Zyman (under review) argues that these adjuncts are not actually stranded in their base position, but rather somewhere high to the right. However, Zyman argues that IS of these elements is legitimate.

[9]The same IS pattern is evidently possible for *exactly* in Hebrew as well:

(20) Ma   (bidyuk) hu amar [(bidyuk) še- anaxnu amurim   liknot   (bidyuk)]?
     what (exactly) he said   [(exactly) C- we   supposed.PL buy.INF (exactly)]?
     'What exactly did he say that we should buy?'   (P.C. Itai Bassi)

(21) *Exactly*-**stranding**
      What$_k$ did you suppose t_k (**exactly/precisely**) that they wanted t_k **exactly/precisely**?

I argue that the intermediately stranded adjunct in (21) must have really been stranded there, and cannot be an adverb of the matrix v/VP. This is because the matrix V *suppose* is independently pragmatically strange with such an adverb:

(22) I supposed tentatively/#**exactly** that five people came to the party

The same stranding pattern is evident with other DP adjuncts of quantity/precision, like *to the nearest pound* in (23). For these adjuncts, it is clear that the stranded adjunct cannot be an adverb of the matrix v/VP:[10]

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

These strandable adjuncts also fit the generalization in (2), as they can be subject to IS, and can precede or follow the moving DP that strands them.

2.7 Summing up

In this section, I've shown you a set of IS scenarios which all fit a certain word order generalization:

(24) **Intermediate Stranding Generalization**   [=(2)]
      IS is only possible when the stranded material is, or can be, to the right of the material that continues to move leftward

   A potential counterexample from Dutch (Barbiers (2002)) is discussed in section 6. The discussion of this example will be more efficient if left until this later point in the paper. Dutch notwithstanding, the patterns surveyed in this section constitute the cases of IS I am aware of, all of which conform to (2). In the next section I overview two theories of phases and their predictions for IS, arguing that the distribution of IS supports the CL theory.

3   Two phase theories and their predictions

3.1 Chomskyan phases

Chomsky (2000, 2001, inter alia) argues that syntactic structure is mapped onto phonology (PF) and interpretation (LF) incrementally, at domains termed *phases*. Minimally, vP and CP are phases.[11] When the operation *spellout* performs this mapping, the content of
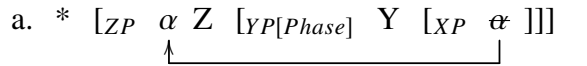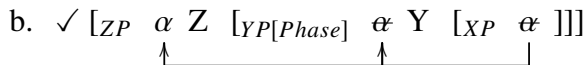
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[10]Credit for this observation goes to David Pesetsky.

[11]DP is also often thought to be a phase, though as far as I can tell the evidence is murky. Zyman (under review) points out that *exactly*-stranding isn't possible in DP edges, puzzlingly if DPs are phases:

the spelled-out constituent by hypothesis becomes inaccessible to the rest of the syntactic derivation. Chomsky argues that spellout applies to only the complement of phase heads. Consequently, moving from a phase directly from its complement isn't possible, since such movement applies too late to escape spellout (26a). However, moving to the edge (specifier) of the phase before its complement is subject to spellout allows further movement out of the phase (26b).
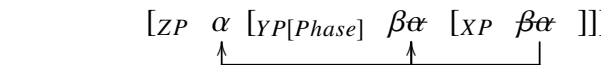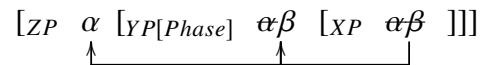
(26) **Must exit phase complement via the edge**

    a. * $[_{ZP}\ \alpha\ Z\ [_{YP[Phase]}\ Y\ [_{XP}\ \alpha\ ]]]$

    b. ✓ $[_{ZP}\ \alpha\ Z\ [_{YP[Phase]}\ \alpha\ Y\ [_{XP}\ \alpha\ ]]]$

In this way, Chomsky's proposal predicts that movement must stop in the edge of each phase crossed, in order to escape spellout of the complement.

3.1.1 Predictions for IS under Chomskyan phases

Given the above argumentation, anything which is in (or can reach) a phase's edge should in principle be available for further movement. Word order should not be at issue here, only structure. Therefore whether or not material stranded at the edge is crossed by what moves on should be irrelevant to IS, and both of the IS scenarios in (27) should be possible:

(27) a. **Crossing at the edge**   b. **No crossing at the edge**

    $[_{ZP}\ \alpha\ [_{YP[Phase]}\ \beta\alpha\ [_{XP}\ \beta\alpha\ ]]]$ $[_{ZP}\ \alpha\ [_{YP[Phase]}\ \alpha\beta\ [_{XP}\ \alpha\beta\ ]]]$

I have argued that the step of A′-movement which strands material in a phase edge does indeed have a word order restriction: The material that is stranded in an edge cannot have (obligatorily) preceded what strands it, hence the attested IS derivations seem to fit the schema in (27b), which involves no crossing, and not (27a).

    I argue that this connection between word order and the availability of IS at phase edges is precisely what the Cyclic Linearization view of spellout predicts, as we'll see next.

3.2 Cyclic Linearization (Fox & Pesetsky 2005)

CL proposes that successive-cyclic movement, among other effects, is a consequence of *Order Preservation*, the information-preserving nature of spellout. As we'll see, Order Preservation constraints the syntactic derivation by only allowing those derivations that do not generate contradictory ordering information. Evidence for such an approach has come from object shift and quantifier movement in Scandinavian (Fox & Pesetsky 2005 a,b),

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(25)   Who$_k$ did Clarence send $[_{DP}\ t_k\ (\textbf{*exactly})$ a picture of t_k] to the museum as a prank?

I am aware of no instances of IS formed by successive-cyclic movement through the edge of DP.

constraints on Right Node Raising (Sabbagh 2007), P-stranding in Russian (Podobryaev 2007) and asymmetries in scrambling (Ko 2007, 2011, 2014). The present paper constitutes another contribution in support of such a theory.

In CL, entire phasal constituents spell-out all at once, edge included.[12] A phase spells-out as soon as it is done being constructed by successive applications of (internal and external) Merge. Since everything in a phase is spelled-out simultaneously, any movement out of a phase, even from the specifier, is of something that has been spelled-out. Therefore the hypothesis that spelled-out constituents are impenetrable for extraction is removed in CL, in order not to inaccurately predict no movement out of phases. If phase-level spellout doesn't target just complements, and spellout doesn't prevent extraction, a Chomskyan explanation of successive-cyclicity is lost.

The alternative hypothesis offered by CL is that successive-cyclic movement occurs to bring moving phrases to the linear edge of each phase moved through. This is necessary to ensure that the ordering information generated for a given phase by spellout is consistent with that of all other phases in the derivation. What follows briefly demonstrates this logic.

Consider a derivation like (28) below, where the moving item *what* non-successive-cyclically moves to spec-CP without passing through the edge of the vP phase:

(28) **Hypothetical non-successive-cyclic movement from vP**
　　 [*CP* What did Mary [*vP* give the cat ~~what~~]]]?

In this dervation, *what* had not moved to the edge of vP at the time when vP spelled-out. Therefore spellout of this vP generates the following ordering information:

(29) **Ordering at vP (without successive-cyclic movement)**
　　 give < the cat < what　　　　　　　　($\alpha < \beta$ means 'α linearly precedes β')

Later, *what* moves in one step to spec-CP. Spellout of CP produces the linearization in (30):

(30) **Ordering at CP**
　　 what < did < Mary < [vP's contents]

Notice that in (29), *what* follows everything in vP. However, in (30) *what* precedes everything in CP, and so ultimately precedes everything in vP. Thus we have a contradiction: In this derivation the moving phrase *what* has been determined to simultaneously follow and precede the content of vP. CL posits that such contradictory results yield a derivation that is deviant at PF. Due to Order Preservation, offending linearization statements cannot be deleted in order to avoid such problems. Thus an alternative syntactic derivation is required.

Notice that if *what* moves to the most linearly peripheral position of vP before vP spells-out, the contradiction is avoided. Performing such movement to the edge yields the following linearization for vP:

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[12]If spellout applies to the complement of phase heads, it is unclear how the edge of a root CP is spelled-out, as there is nothing above it. A version of this problem is pointed out by Grohmann et al. (2017), who dub it the "apex paradox". This problem dissolves under CL, under which entire phases spell-out simultaneously.

(31) **Ordering at vP (with successive-cyclic movement)**
what < give < the cat

This ordering information for vP is not in contradiction with the linearization eventually produced at CP that we saw in (30). When (30) and (31) are combined, both vP and CP find *what* to precede their contents. This result is consistent with *what* ending up at the left edge of the sentence, preceding the content of both phases in this derivation.

Fox & Pesetsky argue that in this way, successive-cyclic movement through the linear edge of phases keeps the ordering information that phase-by-phase spellout generates consistent across a derivation. When material does not exit from the linear edge, incoherent linearizations are generated unless more operations occur to keep the derivation consistent, as discussed further in section 6.

3.2.1 Cyclic Linearization's predictions for IS

Recall the generalization about IS that this paper has argued for:

(32) **Intermediate Stranding Generalization** [(=2)]
IS is only possible when the stranded material is, or can be, to the right of the material that continues to move leftward

In the introduction, I hypothesized that (2) holds to avoid a crossing problem: If the material being stranded at an intermediate phase edge precedes what moves on, the moving phrase must illegally cross over what it strands as it moves on out of the phase (33a):

(33) a. ***Crossing at the edge**   b. **No crossing at the edge**
$[_{ZP}\ \alpha\ [_{YP[Phase]}\ \beta\alpha\ [_{XP}\ \beta\alpha\ ]]]$ $[_{ZP}\ \alpha\ [_{YP[Phase]}\ \alpha\beta\ [_{XP}\ \alpha\beta\ ]]]$
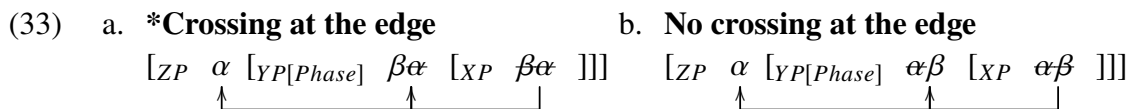
We've just seen that phase-exiting movement steps which cross material within the phase on the way out are precisely what CL bans. Thus CL accurately rules out (33a), but predicts no issues for (33b). Consequently, CL predicts the intermediate stranding generalization. The crossing problem that derives this generalization applies only at phase edges. Thus base position preposition stranding in English, for instance, is correctly permitted.[13]
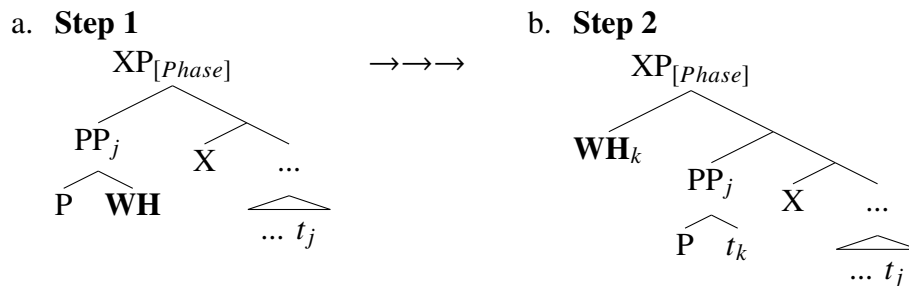
4 Agree and other constraints on movement

This work so far has argued that CL accurately derives the restrictions on IS. Further consideration of the possible IS derivations reveals a problem, however. If IS is illicit when it would be necessary for movement out of the phase to cross what is being stranded at

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[13]Though base-position preposition stranding is absent in many languages, a few of which we've seen above. For instance, as Bošković (2004) overviews, Dutch must pied-pipe prepositions, but allows stranding of postpositions. This fact is predicted if PP is a phase in such languages and Abel's (2003) anti-locality holds, though see that work for a more thorough discussion of the complications in this area.

the phase edge, IS of material that precedes what strands it should be permitted under the following circumstance: If the phrase that will exit the phase moves to a higher specifier of this phase, above the preceding material that it pied-piped, that pied-piped material will not be crossed by movement out of the phase.

For instance, IS of prepositions in English might hypothetically be derived by moving the complement of a pied-piped PP across P, to a higher specifier of the same phase:

(34)   **Hypothetical phrase-bound spec-to-spec movement (to be ruled out)**

a. **Step 1**

$XP_{[Phase]}$

PP_j X   ...

P   **WH**   ... t_j

$\rightarrow\rightarrow\rightarrow$

b. **Step 2**

$XP_{[Phase]}$

$\mathbf{WH}_k$

PP_j X   ...

P t_k ... t_j

The possibility of such specifier to specifier movement within the same phrase must be eliminated, otherwise we wrongly predict IS of elements that precede what strands them.

Chomsky (2015) argues that Merge and therefore also Internal Merge (aka 'movement') apply freely in '*Move α*' fashion, without a triggering feature. If this view is correct, it is not clear what bans derivations like (34).

In contrast, other works argue that movement must be triggered by an Agree relation (Chomsky 1995, 2001, Ko 2007, 2014, van Urk 2015). Ko points out that this view predicts a ban on phrase-bound spec-to-spec movement, if moving an element to the specifier of a head requires a probe on that head to find that element in its c-command domain via Agree. Since heads don't c-command their specifiers, they can't probe and move material from one of their specifiers to another. For instance, in (35) below, the head α can in principle probe its complement δP or any content in δP, but the specifier βP and its contents are inaccessible to α, and therefore cannot be moved by it.

(35)   **Heads do not c-command (and so cannot move) their specifiers**

αP

βP α^0 δP

... γP   [uF:_]   ... ϵP
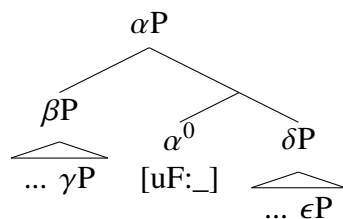
This concept provides an explanation for why derivations like (34) above should not be possible, as desired. The movement of WH in (34b) could not have occurred, because X did not c-command WH at the point in the derivation when this movement applied. The same goes for any potential scenario of phrase-bound spec-to-spec movement.

4.1 The role of anti-locality

While movement within the phase edge has just been ruled out, nothing has been said that prevents movement within the pied-piped constituent. For instance, returning to the P stranding scenario above, it is also necessary to ensure that WH cannot come to precede P by moving to spec-PP, as in (36) below. This movement within the pied-piped constituent is derivable by Agree-triggered movement, because P c-commanded WH at the time when this movement applied. However, such movement from complement to specifier of the same phrase is prevented by the principle of anti-locality in Abels (2003).

(36) ***Illegally short movement within pied-piped constituent**

$$XP_{[Phase]}$$

$$PP_j \quad X \quad \dots$$

$$\mathbf{WH}_k \quad P \quad t_k \qquad \dots t_j$$
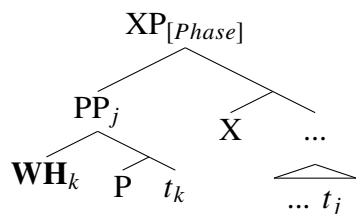
Notice that if the pied-piped constituent is structurally larger, rather than being a single phrase like the PP above, movement within it should be permitted. For example, in (37) below movement of WH pied-pipes YP and ZP to spec-XP. Movement of WH from ZP to the specifier of YP is not ruled out by anti-locality:

(37) **Legal movement within larger pied-piped constituent**

$$XP_{[Phase]}$$

$$YP_j \quad X \quad \dots$$

$$\mathbf{WH}_k \quad Y \quad ZP \qquad \dots t_j$$

$$\dots t_k$$
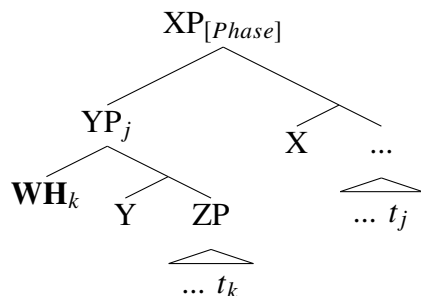
In short, this perspective predicts that IS of material that precedes what pied-pipes it should be possible, provided that the pied-piped material is complex enough to permit the material that will move on to pass through the edge of the pied-piped constituent.[14]

Such a structural scenario could be the case for material that can be ordered on either side of what it attaches to. Such a circumstance was mentioned in section 2, for certain

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[14]While I've spoken in terms of Abels' anti-locality, other versions of anti-locality like that of Erlewine (2015) will make similar predictions, though further collection of IS patterns may reveal scenarios that adjudicate in favor of one of these approaches.

On a related note, Richards (2004) argues that in Bulgarian we see movement of a first *wh*-phrase to spec-CP, followed by extraction of a second *wh*-phrase out of the first, and into another specifier of the same CP. This sort of spec-to-spec movement is banned outright under the approach argued for in the present paper. However, I suspect that Erlewine's Spec-to-Spec Anti-locality be able to subsume the restrictions I account for by Agree-driven movement, while permitting scenarios like that examined by Richards.

adjuncts of DP in English, Russian ambivalent adpositions, and Japanese/Korean numeral quantifiers. I hypothesize that the structure associated with such elements is complex enough to allow movement within them, and thus their word order variability. This resulting word order freedom also ensures that such material can satisfy the conditions for IS.

The possibility of such scenarios is the reason for the statement "is, or can be, to the right of the material that moves leftward" in the generalization about IS introduced in (2). As long as the possibility of being linearized to the right of what moves leftward exists, the possibility of IS remains, in principle.[15]

4.2   Interim summary: What this theory does and does not predict

This paper has argued that CL and the constrained nature of Agree-driven movement predict a cross-linguistic generalization about word order in IS. What has been said so far predicts that IS of appropriate elements should be possible at any phase edge passed through, in principle. However, this account does not predict that IS must necessarily be possible in every such edge. There is no contradiction in allowing the distribution of IS predicted by the argumentation so far to be further constrained by additional factors. This is likely the case, as in reality there are gaps in most IS paradigms.

The remainder of this paper focuses on such additional constraints on IS. In the next section, I continue my examination of CL plus Agree-driven movement, which I'll show predicts further circumstances in which linearization requirements remove the possibility of stranding in an edge. Section 6 goes on to consider the role of extra-syntactic factors.
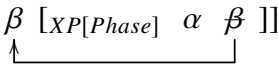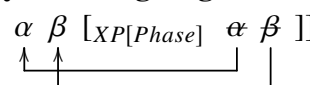
5   When an edge must be emptied

As described in section 3, CL derives successive-cyclic movement through phase edges from the logic of Order Preservation—movement through the linear edge of each phase crossed keeps the linearization information established at all phases passed through by that movement consistent. This same logic also predicts that certain exceptions to successive-cyclicity are possible, as long as further movements occur that keep linearization coherent. This theory leads to predictions about a certain class of scenarios where a given edge will not be available for stranding, even if the material to be stranded there satisfies the conditions that this paper has discussed so far.

Let's overview these predictions. In (38) below, we see a schema for non-successive-cyclic movement and its repair. In (38a), the element α precedes β within the phase XP before movement. Here β moves out of XP without stopping in its edge, thus crossing α on its way out. As discussed, such scenarios are predicted to result in an incoherent set of linearization information for this derivation. This is because the crossing of α by the

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[15]If such word order variability is simply a result of free choice ordering between two elements, the same result holds. Whether or not word order variability in a given scenario is due to optionality at PF, or is derived by movement, is not important here. Either situation should provide the conditions for legal IS.

movement of β creates a set of linearization information that tells PF that β both follows and precedes α. CL predicts that this problem is avoided, however, if α also moves into the next phase, to a position above β, as in (38b). The result of this movement is that α precedes β within the next phase just as it did within XP.

(38) a. **Illicit crossing at the edge...**

          * [$_{YP[Phase]}$ β [$_{XP[Phase]}$ α β]]

     b. **...repaired by restoring original order**

          ✓ [$_{YP[Phase]}$ α β [$_{XP[Phase]}$ α β]]

In this way, CL predicts a class of exceptions to successive-cyclic movement. A non-successive-cyclic phase exit does not crash a derivation, as long as additional order-restoring movement operations occur. This scenario is the essence of Fox & Pesetsky's account of Holmberg's Generalization, in which movement of an object across V (or anything else in VP) requires movement of the material that the object crossed over.

Returning to the topic of IS, the predictions illustrated by (38) lead us to expect that any phase edges that were crossed over by such a non-successive-cyclic movement should not be viable positions to strand material in. Rather, such positions must be vacated in the way shown in (38b). Consequently, any material that was pied-piped into such an illicit edge must be pied-piped further, even if stranding in that edge would have been possible otherwise.

In the rest of this section, I'll examine how these predictions play out in several case studies of IS at clause-internal positions, where head-movement and A-movement interact with the distribution of IS.

5.1   DP adjunct stranding in English

In section 2 I discussed *exactly* and other adjuncts of DP which are capable of IS at clause edges, shown again below:

(39) a. **What**$_k$ did you suppose t_k (**exactly/precisely**) that they wanted t_k?
     b. **How much saffron**$_k$ does the chef say t_k (**to the closest gram**) that we need t_k?

Zyman (under review) argues that *exactly*-stranding is possible in spec-vP, as in (40), but notes some inter-speaker variation regarding the acceptability of such sentences.

(40) *exactly*-**stranding in spec-vP**   (Zyman, under review)
     a. What was he **exactly/precisely** doing there?
     b. What did she **exactly/precisely** send?

This preverbal stranding position is also a usual place for v/VP level adverbs in English. Adjuncts like *exactly* and *precisely* are able to modify DPs, as we've seen, but can also be

adverbs of v/VP. I argue that the possibility of parsing such adjuncts in (40) as adverbs, rather than stranded DP adjuncts, confounds the nature of such examples. Thus we need a semantically cleaner diagnostic.

I suggest that the solution is to focus on the distribution of other DP adjuncts, like that in (39b) above. As I showed in section 2, these adjuncts have the same distribution as stranded *exactly*, but they are clearly DP modifiers and not v/VP level adverbs. Attempting spec-vP IS with such adjuncts yields clearly ungrammatical results:

(41) **No DP adjunct stranding in spec-vP**
      How much flour did you [$_{vP}$ (***to the nearest pound**) tell me [$_{CP}$ (to the nearest pound) that the bakery [$_{vP}$ (***to the nearest pound**) asked you for (to the nearest pound)]]]?

The concepts defended in this paper, CL and Agree-driven movement, predict this gap in the stranding paradigm when we consider the interaction of successive-cyclic A′-movement with A-movement of the subject. CL requires an A′-moving phrase to stop in the most peripheral position of the vP phase, a specifier above that of the in situ subject (here EA) in its θ-position:

(42) **A′-movement to outer spec-vP**
      [$_{vP}$ WH$_k$ EA v-V t_k]

There is no problem with the subject later A-moving to spec-TP across that outer spec-vP formed by successive-cyclic movement, as long as the content of the outer A′-specifier moves along to spec-CP as well. In this scenario, the relative order of the moving phrases is the same in vP as in CP, yielding a coherent linearization for the derivation.

(43) **A′-movement to spec-CP, A-movement to spec-TP**
      [$_{CP}$ WH C EA T [$_{vP}$ WH$_k$ EA v-V t_k]]

However, if *wh*-movement strands something in that outer spec-vP, movement of the subject across the stranded material yields a crossing problem. This is shown in (44), where we see that while there is no problem if the moving *wh*-phrase pied-pipes the element α to spec-CP, there is a problem if α is stranded in vP and thus crossed by A-movement of EA:

(44) **Conflict between EA movement and stranding in the vP edge**
      [$_{CP}$ WH($\checkmark\alpha$) C EA T [$_{vP}$ WH$_k$-(*α) EA v-V t_k]]

Under CL, theme subjects must also pass through the same lower spec-vP as external arguments, given that V moves to v in English (Larson 1988, Chomsky 1995, Kratzer 1996, and others). Such movement is necessary to ensure that the theme subject precedes V within vP, as it will later after movement to spec-TP.

(45) **V movement and theme subject movement within vP**

$[_{vP}$ SUBJ v-V $[_{VP}$ ~~V~~ ~~SUBJ~~]]

If this derivation is accurate, theme subjects will cross over anything stranded in the vP edge by A′-movement, just as external arguments will. The resulting derivation looks the same as (44), except that the theme subject moves into vP rather than being externally merged there before A-moving to spec-TP. Given this, IS in the edge of vP should not be possible in passive and unaccusative derivations. This prediction is shown to be verified in (46):

(46) a. ***DP adjunct stranding in spec-vP: Passive subject**
       $[_{CP}$ [How much flour]$_k$ (to the nearest pound) was the bakery $[_{vP}$ t_k (***to the nearest pound**) sent t_k (to the nearest pound)]]?

   b. ***DP adjunct stranding in spec-vP: Unaccusative subject**
       [How many firefighters]$_k$ (to the nearest dozen) did the house $[_{vP}$ t_k (***to the nearest dozen**) burn down despite the efforts of t_k (to the nearest dozen)?]

To sum up, while the strandable DP adjuncts considered here should in principle be able to be left behind in spec-vP, A-movement of the subject crosses over any material stranded in the linear edge of vP, preventing IS there. This violation caused by A-movement of the subject could be avoided if it were possible to rearrange the content of the vP edge. For instance, in (47) successive-cyclic movement of WH pied-pipes α to the vP edge, above the subject. Subsequently the subject moves over WH and α, and then WH moves over the subject, stranding α below.

(47) **Successive-cyclic movement followed by rearranging in the vP edge**

$[_{vP}$ WH SUBJ [~~WH~~-α] ~~SUBJ~~ v-V $[_{VP}$ [~~WH~~-~~α~~]]]

Such a derivation produces a vP that is consistent with the final ordering that will be produced in CP, and importantly, movement of the subject to spec-TP will not cross the stranded α after these rearrangements have occurred. However, given Agree-triggered movement and resulting the ban on phrase-bound spec-to-spec movement discussed in section 4, such a derivation is not available.[16]

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[16]This discussion has focused on stranding in the vP edge by successive-cyclic A′-movement of internal arguments. A′-movement of a *wh*-subject out of TP should also in principle be able to strand an adjunct there. While A′-extraction of subjects typically invokes the *that*-trace effect, an adverb placed between CP and TP can ameliorate this effect (Bresnan (1977), a.o.), allowing for clearer testing of stranding in spec-TP. As far as I can tell, this test shows that stranding under A′-movement of subjects is possible in CP, but not TP:

(48) Who did you say $[_{CP}$ (**exactly**) that [extremely fortunately] $[_{TP}$ (***exactly**) escaped the fire]]?

This finding is consistent with the claim that *wh*-subjects in English do not pass through spec-TP (McCloskey (2000); Bošković (2004)).

17

5.2 Spec-vP IS *all*-stranding in West Ulster English(es)

In the introduction, we saw that West Ulster English as reported by McCloskey (2000) can strand the postnominal quantifier *all* in spec-CP:

(49) **West Ulster *all*-stranding** (McCloskey 2000, ex. 8)

What$_k$ (all) did he say [$_{CP}$ t_k **(all)** (that) he wanted t_k (all)]

McCloskey points out that *all*-stranding in spec-vP isn't possible, presenting a gap in the paradigm. McCloskey's analysis of West Ulster English suggests that V moves to a head above vP, thus his examples showing this gap attempt *all*-stranding after V:

(50) **No *all*-stranding in spec-vP** (McCloskey 2000, ex. 14e)

What$_k$ did he tell$_j$ [$_{vP}$ t_k **(*all)** t_j his friends [$_{CP}$ t_k (all) that he wanted t_k?]]

Henry (2010) shows that West Ulster English has a number of sub-varieties, some of which do appear to permit IS in spec-vP, as shown in (51-52). Henry shows that the actual position of such IS in those dialects that permit it is pre-verbal, suggesting that this position is the actual landing site of clause-internal successive-cyclic A′-movement in West Ulster English:

(51) **Spec-vP IS in South Derry English**

    a. What$_k$ did he t_k **all** do t_k on holiday? (Henry 2010, ex. 25)

    b. Where$_k$ does she t_k **all** see her students t_k? (Ex. 29)

(52) **Spec-vP IS in East Derry English**

    a. What$_k$ did he t_k **all** do t_k in Derry? (Ex. 52)

    b. Who $_k$ did he t_k **all** say was elected t_k in the council elections? (Ex. 56)

Henry's study finds that the dialect examined by McCloskey corresponds to a variety he terms West Derry City English, and observes that this dialect, along with the Strabane dialect, indeed does not permit IS of the form in (51-52).[17][18]

    The fact that any dialect of English permits IS in the edge of the verbal domain presents a puzzle. The discussion of DP adjunct stranding in standard English in the previous subsection has lead to the prediction that spec-vP IS should generally be illicit in English, or any languages where vP is a spellout domain and subjects move out of vP.[19]

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[17]McCloskey argued that V raises out of vP in West Ulster English due to a number of facts about *all*-stranding internal to the verbal domain. While the articulated verbal structure that McCloskey's analysis implies may well be correct, I take Henry's subsequent findings as evidence that the real edge of the verbal phase in West Ulster English is this pre-verbal position where we see some dialects permitting IS.

[18]Tilleson (2017) also observes that Upper Midwestern American English permits *all*-stranding in spec-vP.
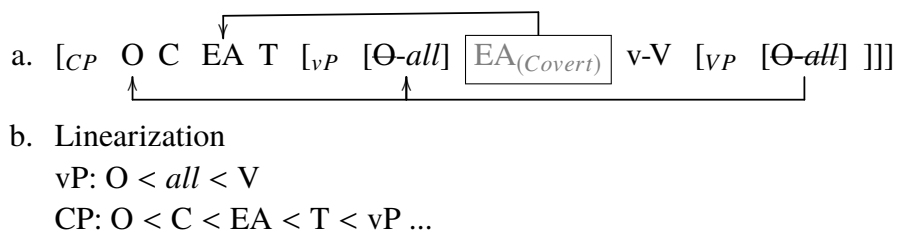
[19]One way out of this puzzle is to propose that the apparent instances of spec-vP IS are actually involve an adverbial *all*, though this analysis would make it suspicious that this adverbial *all* is apparently not available in some dialects. Further, if such instances of *all* are adverbial and thus not products of stranding, they ought to also be licit in environments where there is no A′-movement that could have stranded them. I don't know whether this is the case, so I don't pursue such an account here.

We might hypothesize a syntactic difference between dialects to account for this puzzle. However, the natural null hypothesis is that the underlying syntax of these varieties is fundamentally the same. Fox & Pesetsky (2005a, 2003) raise similar issues in their examination of Holmberg's Generalization and related effects in Scandinavian languages. They observe that there is some conflicting evidence across languages/dialects about the relationship between the external argument and the linearization of the content of VP. Fox & Pesetsky point out that such facts could be accounted for by positing a difference in where spellout applies—for instance, if in a given language spellout applies to a constituent either larger or smaller than vP, different predictions are generated about how such spellout will constrain the derivation.

However, Fox & Pesetsky argue that it is not necessary to posit that languages differ in which constituents are spellout domains. Fox & Pesetsky suggest that the differing interactions of external arguments with the linearization of v/VP can be resolved by the concept of covert external merge. If external merge of an external argument may be covert in a given language, the external argument will not be linearized within vP, and therefore will be irrelevant to the concerns of Order Preservation between vP and CP.[20]

Consider the application of this idea to IS in spec-vP. We've seen previously how A-movement of the subject results in a linearization conflict if successive-cyclic A′-movement strands anything in the edge of vP. But if there are some dialects for which the subject is not (or need not be) linearized within vP, as in (53) below, subsequent movement of the subject will not interrupt spec-vP IS:

(53) **External argument covert within vP**

    a. [$_{CP}$ O C EA T [$_{vP}$ [O̶-*all*] EA$_{(Covert)}$ v-V [$_{VP}$ [O̶-*a̶l̶l̶*]]]]

    b. Linearization
        vP: O < *all* < V
        CP: O < C < EA < T < vP ...

In this case, the subject is not overtly spelled-out until it moves into the CP phase.

I suggest that whether a given language/dialect permits material to be covert in the phase where it undergoes external merge is a point of variation at PF. The parameterization chosen here will (partially) determine whether a given language permits spec-vP IS under A′-movement out of vP. In appendix A, I discuss how independent findings about the

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[20]In particular, Fox & Pesetsky suggest the possibility of external merge applying within a phase after it spells-out, the result of that merge consequently being covert. As far as I can tell, the same thing is achieved if the PF in some languages permits spellout to ignore certain elements. Such ignored material would thus need to move into another phase to surface.

This circumstance where certain instances of an element appear to be ignored by PF is evocative of Sportiche (to appear)'s principle of *Neglect*. Clearly such a principle must be constrained, since if intermediate representations can be freely disregarded by PF, linearization contradictions would essentially never be expected to hold. See that work for discussion on when neglect might apply.

distribution of overt and covert movement provide a way of understanding, more specifically, why subjects may be able to be covert in vP in IS scenarios.

As mentioned in the previous subsection, Zyman (under review) claims that *exactly*-stranding in spec-vP is possible in English, though subject to some inter-speaker variation. I claimed that such stranding is in fact not available, based on the testing of other strandable DP adjuncts that cannot be construed as adverbs. However, if for some English speakers spec-vP IS is undeniably a reality, the considerations discussed above apply—such speakers may have a parameterization that permits the subject to remain covert in vP. The same can be said for inter-dialect variation in West Ulster English.

5.3   IS and scrambling in Polish

The Polish facts presented in section 2 require further consideration, given the predictions in focus in this section. To recap, Wiland (2010) argues that in Polish, left branch extraction can strand NP in spec-CP, spec-vP, and spec-VP, all of which Wiland suggests are phases. These stranding facts are illustrated again below:

(54)   **IS of NP under left branch extraction in Polish**   (Wiland 2010, ex. 3-5)

    a. **IS in spec-VP**

        Jaki$_k$ Paweł kupił   [t_k **samochód**]$_j$ swojej żonie t_j
        What Pawel bought [car]   his   wife?

        'What car did Pawel buy his wife?'

    b. **IS in spec-vP**

        Jaki$_k$ Paweł [t_k **samochód**]$_j$ kupił   swojej żonie t_j
        What Pawel [car]   bought his   wife?

        'What car did Pawel buy his wife?'

    c. **IS in spec-CP**

        $^?$**Jaki**$_k$ *pro*   myślisz [t_k **samochód**]$_j$ (*że)   Paweł kupił   swojej żonie t_j
        What   (you) think   [car]   (*that) Pawel bought his   wife?

        'What car do you think that Pawel bought his wife?'

Wiland's claims present two issues for the account this paper has argued for.

First, Wiland provides some evidence that in Polish V moves to v, and raises no higher. If VP is a phase, consider that movement of V to v necessarily crosses any material stranded in spec-VP. This is because there is no position within VP where V can precede the specifier(s) of VP, given the Head Movement Constraint (Travis (1984)). This is shown in (55), which diagrams (54a) at the vP level:

(55)   **V movement over NP stranded in spec-VP**

    [$_{vP}$ WH v-V EA [$_{VP}$ [~~WH~~-**NP**] IO ~~V~~ [~~WH~~-**NP**]]
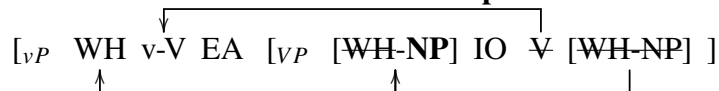
Under CL, this non-successive-cyclic crossing of spec-VP by head movement should require that spec-VP be emptied. Therefore (apparent) stranding in spec-VP in Polish is problematic.

Second, notice that in (54b) above, the subject precedes the material that Wiland claims was stranded in spec-vP. If vP is indeed a phase in Polish, stranding in spec-vP followed by movement of the subject out of vP should create a crossing configuration that prevents spec-vP IS, as discussed in the previous subsection. While I might claim that Polish allows for the subject to remain covert in vP, as suggested for sub-varieties of West Ulster English above, I'll argue that these Polish facts are consistent with scrambling, a very productive operation in Polish (Szczegielniak (2001)).

As Wiland shows, the pre-verbal and post-verbal positions that he claims are respectively the positions for spec-vP and spec-VP IS are also potential landing sites for scrambling:

(56) **Scrambling in Polish** (Wiland 2010, ex. 25)

Maria (*pieniądze$_k$) powiedziała [$_{CP}$ że (pieniądze$_k$) Piotr (**pieniądze$_k$**)
Maria (money-ACC) said that (money-ACC) Piotr (money-ACC)
oddał (**pieniądze$_k$**) bratu t_k]
returned (money-ACC) brother-DAT ?

'Maria said that Piotr had returned the money to his brother'

Evidently these are positions where DPs can surface, independent of *wh*-movement. Wiland notices that it is in principle possible to analyze some of the cases of (apparent) IS as scrambling of the NP remnant of left branch *wh*-extraction. In response to this possibility, he points out a difference between scrambling and stranding under *wh*-movement, which he argues reveals that the latter cannot be reduced to the former.

Wiland points out that scrambling in Polish is clause-bound. This was shown in (56) above, where we see that the object *money* can only scramble within the embedded CP where it originated. This constraint on scrambling contrasts with *wh*-movement in Polish, which can cross clause boundaries:

(57) **Polish *wh*-movement is not clause-bound** (adapted from Wiland 2010, ex. 20a)

[**Jaki samochód**]$_j$ *pro* powiedzialeś [$_{CP}$ (że) Paweł kupił swojej żonie t_j]]?
what car (you) said that Pawel bought his wife?

'What car did you say that Pawel bought his wife?'

Wiland claims that it is possible for Polish *wh*-movement from an embedded clause to strand NP in the matrix clause, based on examples like (58):

(58) **NP stranding under LBE in matrix spec-vP**

$^{\%}$**Jaki**$_k$ Maria [t_k **samochód**]$_j$ myślała (*że) Paweł kupił swojej żonie t_j
What Maria [t car] think (*that) Pawel bought his wife t?

'What car did Maria say she bought?'

Wiland points out that the displaced NP in (58) must have been moved by genuine stranding under *wh*-movement, because as (56) teaches us, it could not have scrambled there.

I argue that the mechanisms of Polish that Wiland presents actually provide a way for examples like (58) to be generated by appropriately local clause-bound scrambling. I hypothesize that such apparent non-local scrambling is parasitic on the unbounded nature of Polish *wh*-movement. We have seen that it is possible for Polish *wh*-movement to pied-pipe NP from an embedded clause, stranding it at the clause edge, as in (53c). I suggest that pied-piping NP (at least) as far as the edge of the lower clause makes NP accessible to scrambling operations in the higher clause, allowing examples like (58) to be generated without recourse to IS in spec-vP, as in (59):

(59) **Stranding in embedded clause edge feeding scrambling**

$[_{CP2}$ WH C ... $[_{vP}$ NP V $[_{CP1}$ [WH NP] C ... [WH NP]]]]
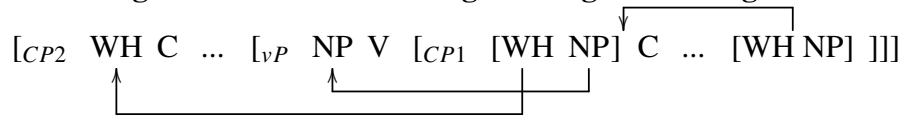
If this analysis is correct, the examples claimed by Wiland to constitute IS in spec-vP and spec-VP need not be analyzed this way, so these examples do not need to be considered counterexamples the the proposals defended in the present paper. However, I have no reason to contest that Wiland's examples of stranding in spec-CP are genuine, and in fact I am relying on spec-CP IS as an intermediate stage of sentences like (58).

5.4   Spec-vP IS in Japanese and Korean

In section 2, I showed that spec-vP IS in Japanese and Korean is possible. Here I'll overview Ko's evidence that vP is indeed a phase in such languages, and then show why, given the syntactic properties of these languages, spec-vP IS is expected to be a possibility.

Ko (2007, 2011, 2014) analyzes some properties of syntactic edges using the same concepts argued for in the current paper, focusing on the interaction of movement and numeral quantifier stranding in Korean and Japanese. As mentioned in section 2, these languages can strand certain numeral quantifiers under scrambling:

(60) **Numeral quantifier stranding by object scrambling in Korean**

Maykcwu-lul$_k$ John-i   [t_k **sey-pyeng**] masiessta
Beer-ACC   John-NOM [3-bottle   ] drank

'John drank three bottles of beer'   (Ko 2014, pg. 31, ex. 1b)

In (60), the subject intervenes between the scrambled object and and the stranded numeral quantifier. In contrast, in these languages it is not possible to create configurations where the subject and an associated numeral quantifier are separated by the object:

(61) ***Object between subject and its numeral quantifier in Korean**

*Haksayng-tul-i$_k$ **maykcwu-lul** [t_k sey-myeng] masi-ess-ta
Students-PL-NOM beer-ACC 3-people drink-PAST-DECD

'Three students drank beer' (Ko 2014, pg. 32, ex. 7)

Such ungrammatical examples could plausibly have been derived by scrambling the object over the subject, as we learned is possible from (60), followed by scrambling the subject over the object, resulting in stranding of the subject's numeral quantifier:

(62) **Scrambling of object and subject** (Ko 2014, pg. 31, ex. 2b)

[S O [t_{SUBJ} NQ$_{SUBJ}$] t_{OBJ} V]
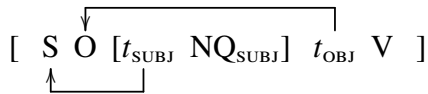
Ko points out that subject scrambling is attested in these languages (contra Saito (1985)), so the absence of derivations like (62) remains puzzling.

Ko argues that a solution emerges given the same concepts made use of in the present paper: CL and Agree-triggered movement, the latter of which restricts movement in phrase edges. In short, if vP is a spellout domain, a final word order where the object separates the subject and its associated numeral quantifier, as in (61), must be derived within vP. However, Ko argues that the necessary derivation cannot occur within vP. While movement of the object above the subject poses no problems, subsequent subject scrambling from a lower spec-vP to a higher one in order to strand the numeral quantifier is not possible. As discussed previously, the Agree-driven nature of movement prevents such subject movement.

Ko's solution to this puzzle required that vP is a phase in Korean and Japanese, just as has been claimed of languages like English with a more rigid word order. If vP is a phase in a given language, we expect IS in spec-vP to be possible, as long as other factors don't interfere. Two possible sources of interference have been mentioned in the other case studies in this section: A-movement of the subject out of vP, and head-movement across the phase edge, which due to the Head Movement Constraint has no choice but to non-successively cross any specifiers of the phase.

(63) **Leftward head-movement out of vP disrupts spec-vP IS**

[$_{XP}$ WH$_k$-($\checkmark\alpha$) X-v-V [$_{vP}$ WH$_k$-(*α) v-V t_k]]
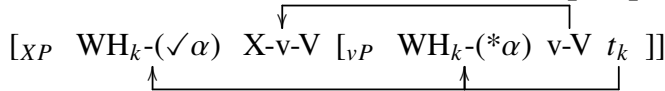
These predictions lead us to expect that spec-vP IS should be possible in a language where the subject can remain in situ, and where heads are linearized to the right, so that any head movement that may occur never crosses spec-vP. Korean and Japanese are such languages. These languages are head final, and allow subjects to remain in situ under object scrambling. As we saw in section 2 such spec-vP IS of numeral quantifiers under object scrambling is possible for Korean and Japanese, repeated below:

(64) **IS of numeral quantifier by object scrambling in Korean** (Ko 2011, ex. 24)

Kong-ul$_k$ amato   [$_{vP}$ [t_k **sey-kay**]$_j$ haksayng-tul-i t_j patassulkesita]
Ball-ACC probably   3-thing   student-PL-NOM   received

'The students probably received three balls'

(65) **IS of numeral quantifier by object scrambling in Japanese**

Neko-o$_k$ osoraku [$_{vP}$ [t_k **san-biki**]$_j$ gakusei-ga   umaku t_j mitsuketa]
cat-ACC probably   3-CL   student-NOM skillfully   found

'The students probably skillfully found 3 cats'   (P.c. Takashi Morita)

5.5   Spec-vP stranding in Dutch (Barbiers 2002)

Barbiers (2002) argues that long-distance A′-movement in Dutch can strand various adpositions and modifiers in the matrix spec-vP:

(66) **Stranding in spec-vP in Dutch**

    a. Waar$_j$ had jij   dan [$_{vP}$ [j **mee**]$_k$ gedacht [dat je   de vis t_k zou   moeten
       where had you then   with   thought that you the fish   would must
       snijden]]?
       cut

       'I had thought that Ed would buy only one book'   (Barbiers 2002, ex. 6a)

    b. [Een boek]$_j$ had ik [$_{vP}$ [**maar** j]$_k$ gedacht [dat Ed t_k zou   kopen]]
       One book   Had I   only   thought that Ed   would buy
       'I had thought that Ed would buy only one book'   (Barbiers 2002, ex. 6c)

In these examples, the subject precedes the material claimed to be stranded in spec-vP. As discussed previously, movement of the subject to this position from its θ-position in vP should block spec-vP IS. The possibility of the subject not being linearized within vP as discussed in section 5.3 can eliminate this problem. This solution is probably independently necessary for V2 languages like Dutch, as Fox & Pesetsky (2003, 3005b) discuss. In a V2 language, movement of an arbitrary constituent into spec-CP followed by V to C movement can yield final orders where V precedes the external argument. As there is no position within vP where V can precede the external argument, we are lead to the conclusion that the external argument is not linearized within vP in such languages.

These Dutch facts present a more serious issue, however. While some of the elements Barbiers shows being stranded in examples like (66) followed what moved and stranded them, like *mee* in (66a), one of them, *maar* in (66b), is prenominal in its base position. Thus (66b) looks like a counterexample to the generalization about IS I defended in the first half of the paper:

(67) **Intermediate Stranding Generalization**   [=(2)]
    IS is only possible when the stranded material is, or can be, to the right of the material that continues to move leftward

In section 4.1, I mentioned that IS should be possible when movement within the pied-piped phrase is available. For example, in the schema in (68), movement of WH within the pied-piped constituent YP should be able to feed subsequent IS of YP. This is possible because YP is structurally articulated enough to permit movement of WH to its edge:

(68) **Movement within pied-piped constituent**
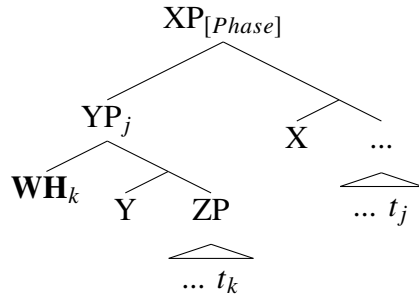
In this way, the set of concepts defended in this paper makes the prediction that when we see IS of material that preceded what stranded it, the stranded material must be associated with a structure that permits movement through its edge.

Since I have no independent evidence for movement through the edge of the constituent headed by *maar*, this conclusion remains unverified. Though such evidence would be ideal, this state of affairs is familiar. Zyman (2017) argues that quantifier float in Janizito P'urepecha involves movement through spec-DP despite the fact that no material ever surfaces in this position, analogous to the fact that *wh*-phrases in English must pass through, but can never surface in, the edge of non-interrogative CP (cf. Bošković (2007)):

(69)   a. *Katie thinks **what** Mike should buy?
        b. What does Katie think (that) Mike should buy?

This Dutch stranding pattern is highly restricted in a number of ways that Barbiers' analysis only sketches an account of. For instance, this stranding is impossible in CP edges or embedded vPs. Further investigation is needed here, and this construction may well involve a more complex derivation than merely stranding under A′-movement.

There is good reason for expecting that the derivation of (66b) may be more complex than it appears. This problematic example involves apparent stranding of *only*. Hirsch (2017) argues for an inflexible semantics of apparent cross-categorial operators, such as coordinators and focus operators like *only*. Hirsch provides cross-linguistic evidence that these elements only combine with clauses (more specifically propositions), and not DPs, despite appearances. If this claim is correct, it suggests that *maar* in (66b) may well have never actually attached to the A′-moving DP. If this is so, this example does not involve stranding of a DP-adjoined element, but something more nuanced. Lacking more information about Dutch at this time, I end the discussion here.

25

6 Further constraints on stranding

This paper has so far explored the constraints on IS predicted by the core concepts under discussion, CL and Agree-triggered movement. Earlier in the paper, I suggested that the distribution of stranding predicted by these two general principles may well be further constrained by independent factors. One such factor that has been discussed already in subsection 5.1 is the possibility of spellout ignoring subjects in vP. In this section, I address some more general ways that syntax-independent constraints can restrict IS.

6.1 Atomisation (Fowlie 2013)

Fowlie (2013) suggests that the PF aspect of spellout has two components. The first of these is termed *Linearise*, which establishes the relative linear order of elements in the way hypothesized by Cyclic Linearization. The second component is an operation she terms *Atomise*, which is based on the view of spellout proposed in Nunes & Uriagereka (2000). Fowlie argues that Atomise delivers a constituent to the phonological component of PF, whereby the structure of that constituent is effectively collapsed. While Linearise does not make the interior of the constituent it applies to inaccessible, Atomise does. In this way Atomise is closer to Chomsky's notion of spellout, as discussed in section 3.

Fowlie argues that these aspects of spellout coexist, but that the timing of their application is subject to language-particular parameterization, with consequences for word order and movement possibilities. In many cases, the Atomisation of a phase must be delayed until the next phase is completed. For instance, an embedded CP that has been exited by *wh*-movement cannot have been atomized as soon as it was completed, or else extraction out of it would not have been possible. I argue that some remaining restrictions on IS can be clarified by Fowlie's understanding of spellout.

The theory argued for in the present paper predicts that any material that is post-nominal and capable of being either stranded or pied-piped by leftward movement should be able to be stranded in intermediate edges, in principle. However, I am aware of a variety of scenarios where these conditions are met, but IS is nevertheless impossible. Example (70) below provides several such situations where potentially strandable elements are unable to be left behind in the edge of an embedded clause:

(70) **Base position stranding but no IS**
   a. How long (ago) did you say ($^{??/*}$**ago**) that you went to France (ago)?
   b. How much (of the chocolate cake) did you say (***of the chocolate cake**) that I ate (of the chocolate cake)?
   c. **Possessor extraction in Greek** (P.c. Sabine Iatridou)

   Pianou$_k$ (to vivlio) ipe o   Yanis t_k (***to vivlio**) oti i   Maria diavase /
   Whose (the book) said the Yanis   (**the book**) that the Maria read   /
   diavase i   Maria t_k (to vivlio)
   read   the Maria   (the book)?

'Whose book did Yanis say that Maria read?'

d. **Stranded postpositions in German** (P.c. Verena Hehl[21])

Da$_k$ (**drunter**) glaube ich t_k (***drunter**) dass die Leiche t_k (**drunter**)
There under   believe I   under   that the corpse   under
begraben ist
buried   is

'Under there I believe that the corpse is buried'

e. ***Combien* split in French** (P.c. Vincent Rouillard)

Combien$_k$ (**de livres**) crois   tu t_k (***de livres**) que je devrais lire t_k (**de**
How-many of books believe you   of   books that I should read   of
livres)?
books

'How many books do you believe that I should read?'

While in the previous section we explored how there are a number of ways that stranding internal to the clause might be blocked, stranding at the edge of an embedded clause ought to be easier to achieve, as this position is not (typically) crossed by head movement or A-movement. Stranding gaps such as this thus present a puzzle.

I hypothesize such scenarios occur when the pied-piped constituent is subject to Atomize. To see how this plays out, first consider the starting state in (71). Here we see a constituent XP inside of a phase YP. The content of XP is α and β. XP will undergo Linearize upon its completion, and Atomize upon the spellout of the containing phase YP.

(71) **Starting state**
    [$_{YP_{[Phase]}}$ Y [$_{XP}$ α β]]

In (72), α extracts from XP to the edge of YP. When YP undergoes spellout, XP is Atomised, making its contents inaccessible to further extraction. This poses no problem for the extraction of α, which occurred after Atomise applied to XP. This scenario represents the situations in (70) above where the relevant material is stranded by extraction.

(72) **Extract from and Atomise XP**
    [$_{YP_{[Phase]}}$ α Y [$_{XP}$ t β]]

In contrast, (73) represents the situations in (70) where the relevant material is pied-piped rather than stranded. In (73) movement of α pied-pipes XP. When the containing phase YP spells-out, Atomise applies to XP, as before. However, in this case α is contained in XP when Atomise applies. While the Atomised constituent XP is accessible to further movement as a whole, α is no longer extractable.

---

[21]This speaker notes that the equivalent of this example in her own dialectical German feels improved. Cross-dialectical variation in the possibility of IS of such elements is natural from the perspective of the account provided in this section, if IS gaps are sometimes the result of idiosyncratic differences in the timing of processes at the PF interface.

(73) **Pied-pipe and Atomise XP**

$$[_{YP_{[Phase]}} \quad [_{XP} \; \alpha \; \beta] \quad Y \quad t \;]$$
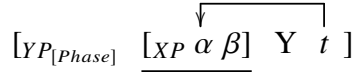
Thus XP can continue moving along to the top of the tree, but it is not possible to extract α, leaving the rest of XP behind in an intermediate position.

(74) ***IS of Atomized XP**

$$[_{ZP} \; \underline{\alpha} \; Z \; [_{YP_{[Phase]}} \quad [_{XP} \; \underline{\alpha} \; \underline{\beta}] \quad Y \quad t \;]]$$
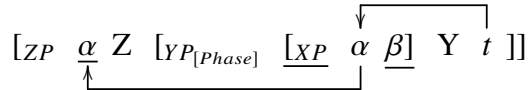
Therefore IS of XP is blocked for the remainder of the derivation.[22]

In sum, constituents subject to Atomise that are in principle strandable must be stranded at the first possible opportunity, or else the pied-piped constituent is effectively locked together for the rest of the derivation, preventing IS, as we saw in (70). In contrast, I claim that constituents that need not undergo Atomise until later on retain the possibility of IS.

6.2 Morpho-phonological requirements

If a given element has certain morpho-phonological requirements that are not satisfied in the position that it is stranded in, or the presence of that element disrupts some morpho-phonological condition of the environment stranded in, we expect that instance of stranding to be ruled out at PF.[23] This is another extra-syntactic way that IS might plausibly be restricted.

A scenario of this type is argued for in McCloskey's (2000) analysis of West Ulster English *all*-stranding. To explain judgment patterns like that in (75), McCloskey hypothesizes that the stranded *all* has a (violable) requirement to incorporate into some preceding head, preferably a verb. In (75), we see 3 cases where *all* is stranded in the edge of the embedded CP. The only difference between these examples is whether or not material intervenes between the stranded *all* and the local V, and if so, how much. The more intervening material, the less acceptable the configuration:

(75) **Prosodic condition on *all*-stranding**

    a. What did he **say all** that he wanted to buy *t*?   (McCloskey (2000), ex. 11b)

    b. What did he **say** ?to him **all** that he wanted to buy *t*?   (Ex. 15b)

    c. What did he **say** ?*to his friends **all** that he wanted to buy *t*?   (Ex. 15c)

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[22]It is possible that some examples like those in (70) do not permit IS because they do not involve stranding anyway, in the sense that I have been assuming. For instance, Starke (2001) suggests that extraction of *combien* in French involves movement of a remnant constituent that has been evacuated by all content except for *combien*. In such a scenario, movement of *combien* is movement of a constituent that does not include the material that *combien* has appeared to strand. Therefore we would not expect this movement of *combien* to be able to strand that material in an intermediate position anyway. The same possibility holds, in principle, for all scenarios like those in (70), pending case-by-case analysis.

[23]This suggestion was made by Cora Lesure.

A similar requirement may explain a gap in the distribution of *exactly*-stranding. *Exactly*-stranding in the edge of an embedded CP is degraded when a righthand matrix adverb intervenes between the matrix V and the stranded adjunct:

(76) **Prosodic interference with IS in English**

    a. (McCloskey 2000, fn. 9)
       What did he say ($^{?}$*yesterday) [$_{CP}$ *t* exactly that we wanted *t*]?

    b. (My example)
       How many pies did you say ($^{?}$*yesterday)[$_{CP}$ *t* [to the nearest dozen] that the bakers delivered *t*?]

In my judgment, such examples improve when the intervening material is phonologically lighter. For example, an intervening pronoun or preposition incurs little to no violation:

(77) **Phonologically light interveners in *exactly*-stranding**

    a. What did you tell **me/him/her** exactly that we want?

    b. Who did you speak **to/with** exactly at the party?

    c. [How many grams of acid] did you report **to us** [to the nearest 100] that the reaction required?

The configurations in (75b) versus (75c), and (76) versus (77), are structurally comparable. What differs is the size of the intervening material. Such facts suggest that a PF requirement restricts the availability of IS in this environment.

Richards (2016) *Contiguity Theory* argues that prosodic well-formedness requirements constrain syntactic derivations in a number of ways. For instance, Richards suggests that such requirements motivate movement as a result of Probe-Goal Agree relations, and restrict the presence of material that intervenes between two elements in a selection relationship. If Richards is right, and such prosodic concerns are operative in constraining the syntactic derivation generally, we should not be surprised such factors restricting IS.

7 Conclusion

This paper has argued that the cross-linguistic distribution of IS stands as evidence for CL and movement operations as Agree-triggered. This theory was examined in terms of what sorts of elements are capable of being intermediately stranded under leftward movement, as well as when a given edge is a licit position for stranding or not. Possible candidates for extra-syntactic factors that constrain the distribution of IS predicted by the general concepts defended here were also discussed. The remainder of this paper discusses some extensions and residual issues for further investigation.

8 Appendices

8.1 Appendix A: Multiple specifiers and covert subjects in vP

In subsection 5.2, I proposed that the possibility of subjects not being linearized within vP provides a PF parameter that can explain, in part, the space of variation in spec-vP IS. Pre-existing findings about the distribution of overt and covert movements provide a means of understanding how subjects might come to be covert in vP in IS scenarios.

Consider multiple *wh*-questions. In some languages, all *wh*-phrases in such construc-tions move to the left periphery. Such a property is typical of Slavic, as Rudin (1988) shows for Bulgarian:

(78) **Fronting of all *wh*-phrases**   (Bulgarian, Rudin 1988)

   koj$_1$ kogo$_2$ __$_1$ vižda? __$_2$
   who.NOM who.ACC   sees

   'Who sees whom?' (Lit: 'Who whom sees?')

Richards (1997) argues that in such scenarios, each *wh*-phrase forms a specifier of CP. Superiority and other economy conditions on movement require that non-initial movements 'tuck-in' into a lower spec-CP, beneath the one that was previously formed:

(79) **Tucking-in *wh*-movement**
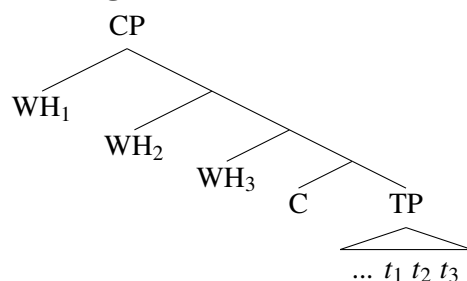
In other languages, such as English, only the initial *wh*-phrase appears to move in a multiple question. All others are pronounced in their base position.

(80) **English multiple question: Movement of only initial *wh*-phrase**
   a. **Who**$_k$ did you say t_k ate what?
   b. *What$_k$ did you say **who** ate t_k?

A variety of works argue that the *wh*-phrases that appear to remain in situ actually do move, but covertly (Huang (1982), Aoun et al. (1993), Richards (1997), Nissenbaum (2000), Pesetsky (2000), Kotek (2014)). In particular, Nissenbaum (2000) argues that non-initial *wh*-phrases in English covertly move and tuck-in, just as we see on the surface in Bulgarian.

The fact that overt movement applies to only the first of several moving *wh*-phrases in English[24] can be translated into a generalized statement about how multiple specifier configurations in this language are evaluated by PF:

(81) **A chain pronunciation rule in English**
When multiple instances of movement yield a phrase with multiple specifiers, only the highest specifier of that phrase is overt..

Nissenbaum provides evidence from parasitic gap licensing that tucking-in in multiple *wh*-movement contexts applies not only at CP, but also at vP, which all moving *wh*-phrases pass through on their successive-cyclic movement path.[25] With tucking-in at vP in mind, return to the topic of covert subjects in vP. When successive-cyclic A′-movement to the edge of vP applies, the in situ subject is consequently not in the highest spec-vP.

(82) **A′-movement to outer spec-vP**
[$_{vP}$ WH$_k$ SUBJ v-V t_k]
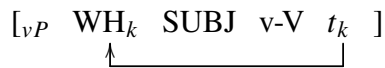
This movement results in the subject becoming inner specifier of vP. Therefore we may reasonably consider the spellout of vP to regard the subject as covert (and thus not linearize it), given (81) above. I propose that whether this is the case, or not, is determined by cross-linguistic parameterization about how such structures are interpreted by PF.

I propose that for some languages, all inner specifiers are treated uniformly, and regarded as covert. In such languages, successive-cyclic A′-movement blocks linearization of the subject in vP, opening up the possibility of spec-vP IS.

(83) **All inner specifiers covert**
[$_{vP}$ WH1$_k$ ~~WH2~~$_j$ **SUBJ** v-V t_k t_j]
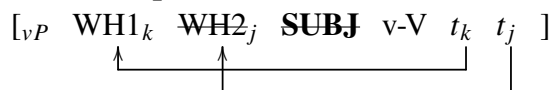
In other languages, I hypothesize that only inner specifiers that are created by A′-movement are subject to covert realization. Inner specifiers created by other means are not. In such languages the subject will participate in the linearization of vP, consequently restricting the possibilities for IS in the vP edge if it undergoes movement out of vP later on.

(84) **Only inner specifiers derived by A′-movement are covert**
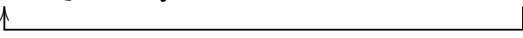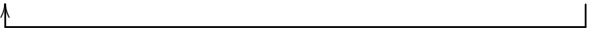[$_{vP}$ WH1$_k$ ~~WH2~~$_j$ **SUBJ** v-V t_k t_j]

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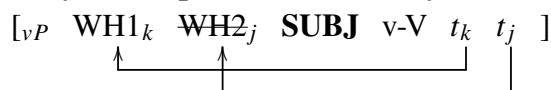
[24]More accurately, such a statement must apply for any language that moves only the initial *wh*-phrase, a phenomenon that is of course widely attested.

[25]It is worth noting here that if CL provides a motivation for successive-cyclic movement through phase edges, it remains unclear why covert movement (plausibly unlinearized, as I've assumed here) must also be successive-cyclic. I see two ways of handling this issue. One is to posit that the relevant movements were in fact all overt originally, but that this fact is obscured by the application of subsequent chain pronunciation rules in a given language. Alternatively, it could be the case that while CL indeed constrains syntactic derivations, it does not directly motivate successive-cyclicity.

8.2 Appendix B: The QP theory of A′-movement

Cable (2010) proposes that *wh*-movement is actually movement of QP, which dominates what we typically think of as the A′-moving phrase. QP can dominate more than just the minimal *wh*-element that we might imagine should in principle be all that must move. When QP dominates additional material, that material is moved along with the *wh*-phrase, resulting in apparent 'pied-piping':

(85) **Pied-piping in QP theory**

    a. [$_{QP}$ Who Q] did you make cookies with *t* exactly?

    b. [$_{QP}$ Who exactly Q] did you make cookies with *t*?

    c. [$_{QP}$ With who exactly Q] did you make cookies *t*?

If this theory is correct for A′-movement generally, as Cable suggests it ought to be, then the status of IS is called into question. If pied-piping occurs when QP dominates more than the minimal A′-feature bearing element, intermediate stranding would have to involve QP somehow dropping off one of its sub-constituents partway along the movement chain. I know of no coherent way to implement such an analysis. However, there are a few reinterpretations of IS that can avoid this issue.

First, we can imagine that what I have called IS is in fact derived by distributed deletion (Faneslow & Ćavar (2002)). Under such a view, the moving phrase does not drop off any of its sub-constituents in an intermediate position. Rather, part of the moving phrase is pronounced at the head of the chain, and another is pronounced in the position of an intermediate copy.

(86) **IS as distributed deletion**
    [$_{QP}$ **What** ~~all Q~~] ... [$_{QP}$ ~~What~~ **all** Q] ... ~~[$_{QP}$ What all Q]~~

Such deletion will be be constrained by the same principles of linearization argued for in this paper, as an operation that affect the distribution of overt syntactic nodes.[26]

Second, IS is derivable in QP theory if it is possible to have a recursive QP structure. Under such an analysis, IS would be derived by sub-extraction of an embedded QP after movement of the QP that contains it.

(87) **IS by embedded QP extraction**
    [$_{QP1}$ What Q1]   ...   [$_{QP2}$ *t* all Q2]   ...   *t*

Such a derivation may be questionable from the perspective of locality/superiority, as well as on semantic grounds. Nevertheless such a derivation is technically a syntactic possibility.

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[26]This hypothesis about IS predicts that a scope bearing element that has apparently undergone IS should take scope as high as the element that appeared to strand it has moved. I have not yet tested this prediction.

8.3   Appendix C: Movement out of moved elements

Whether pied-piping involves the 'target' of movement carrying extra material along, or involves a movement target larger than expected (the QP approach is of this sort), IS can essentially be reduced to a case of of movement out of a moved element. Such movement is known to be highly restricted, and this fact has inspired a large body of work (see Bošković (2018) and references therein). The prerequisites for IS that the present paper has argued for should, all else held equal, apply to movement out of moved elements as well.

Bošković (2018) argues that the theory of phases in Chomsky (2000, 2001) combined with the labeling theory in Chomsky (2013, 2015) predicts that movement out of moved elements is possible, but only under certain circumstances. Assuming that only phases move, Bošković argues that movement out of moved phrases is only possible for elements which either are base generated on the edge of a moved phase, or pass through the phase edge and are agreed with by the phase head.

The present paper has argued that being on the left edge of a pied-piped constituent, at the time when it undergoes spellout, is a precondition for IS. Indeed, most of the data Bošković presents involves movement of elements from the left edge of moved phrases. This confluence of theories presents an interesting opportunity for comparison. As far as I can tell the two may be independently true, but there may be crucial differences in predictions.

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