

CPs Move Rightward, Not Leftward

Benjamin Bruening, University of Delaware (bruening@udel.edu)

draft, August 1, 2017; comments welcome

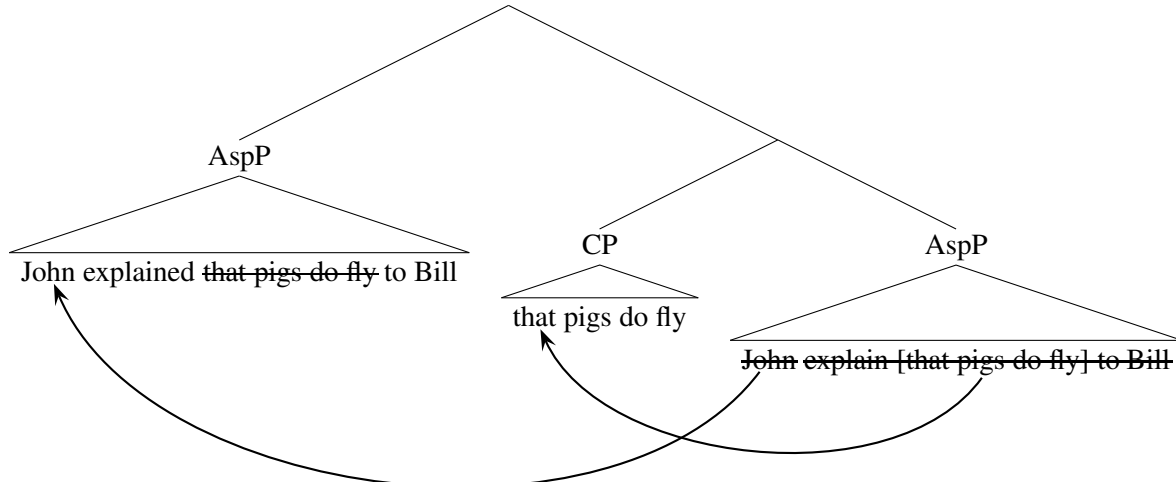
Abstract

Several recent proposals hold that CP complements appear rightmost in many languages by a two-step leftward movement process: first the CP moves leftward, and then a remnant phrase carries all other material to the left of that moved position. I show here that this analysis faces insurmountable problems. In contrast, a simple rightward movement analysis explains all the facts. Importantly, if binding is computed on the basis of precede-and-command rather than c-command (Bruening 2014), the rightward movement analysis accounts for all binding facts. The remnant movement analysis fails to account for binding, since apparent rightward movement does not pattern with clear cases of remnant movement like partial VP fronting. Furthermore, there is a leftward-rightward asymmetry in syntactic category when CPs undergo movement. I show that it is difficult to capture this in a theory that only has leftward movement. I also address preposition stranding in English, which Moulton (2015) presents as an argument for the leftward movement analysis. The results of a large-scale survey reveal that there is actually significant speaker variability in whether prepositions can be stranded when CPs move to the right. I spell out a non-grammatical account of this variability within the rightward movement analysis. The overall conclusion is that rightward movement is not effected by a two-step leftward movement process, and we need a theory of grammar that allows movement upward and to the right.

1 Introduction

In many languages, including English, CP arguments and adjuncts prefer to occupy peripheral positions. Complement clauses, in particular, prefer to appear as far to the right as possible, following all other clausemate material (e.g., Stowell 1981). The traditional analysis of this involves rightward movement of the CP (Rosenbaum 1967, Ross 1967). Several recent publications, however, have argued that CPs move leftward instead. Following leftward movement of the CP, a phrase that the CP has vacated crosses over the CP, resulting in the CP appearing rightmost. Leftward movement analyses of this sort have been proposed by Hinterhölzl (1999, 2006), Kayne (2005), and Moulton (2015). The following diagram illustrates the derivation proposed by Moulton (2015, 310, (16), modified), where the remnant phrase that crosses over the CP is Asp(ect)P:

(1)



(Strikethrough indicates unpronounced lower copies.) Moulton proposes essentially the same derivation for heavy NP shift, following a 1995 unpublished manuscript by Marcel den Dikken.

In this paper, I re-evaluate empirical arguments that have been given for this derivation from binding, extraction, and preposition stranding in English. I also bring in additional evidence involving the syntactic category of displaced CPs that reveals a fundamental asymmetry between leftward and rightward movement. I show that a traditional rightward movement analysis is superior on all counts. In particular, the leftward movement analysis can only account for binding with reconstruction, but I show data indicating that there is no reconstruction of CPs. Rightward shifting of CPs does not pattern with clear cases of remnant movement like partial VP fronting, as it should if the leftward movement account is correct. The rightward movement analysis successfully accounts for the facts, once we recognize that the relevant structural constraint on binding is not c-command but precede-and-command (Bruening 2014). The leftward movement analysis is also unable to account for the leftward-rightward discrepancy in the category of dislocated CPs, since all CP movement is leftward on that account. As for preposition stranding, I present the results of an acceptability survey, which shows that the judgments are not as they have been presented in the literature. In fact there is considerable speaker variability, which I propose an account for within the rightward movement analysis.

The conclusion from all of this is that a rightward movement analysis fares much better than the leftward movement analysis in accounting for rightward displacement of CP complements of verbs. This result is an indication that remnant movement analyses of other apparent rightward movement phenomena are probably also on the wrong track. More generally, constituents can be high and on the right, in direct conflict with antisymmetry approaches to syntax (Kayne 1994).

I begin by outlining the two competing analyses under comparison here (section 2). Section 3 presents the binding facts and shows that the leftward movement analysis cannot account for them. Section 4 shows that leftward and rightward movement of CPs differ in the syntactic category of the base position, something that the leftward movement analysis also cannot account for. Section 5 discusses preposition stranding in English, and presents the results of a survey that call into question the judgments that have been presented in the literature. Section 6 addresses extraction from CPs and shows that it is not a problem for the rightward movement analysis, but may be for the leftward movement analysis.

2 The Two Competing Analyses

This section presents the two competing analyses, preparatory to comparing them on empirical data.

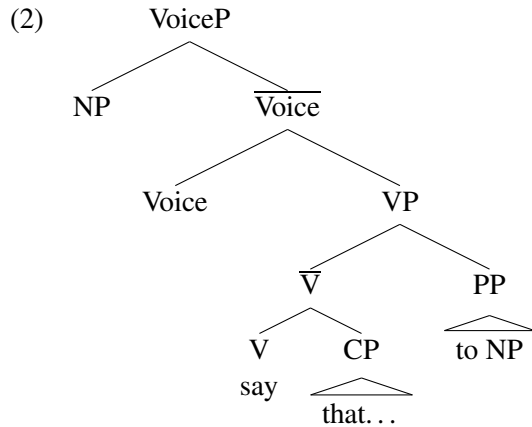
2.1 The Leftward Movement Analysis

The leftward movement analysis is spelled out in most detail in Moulton (2015). As described in the introduction, the leftward movement analysis claims that a CP that appears to be dislocated to the right actually moves to the left. A phrase that it moved out of then crosses it, making it rightmost in the clause. As also described in the introduction, in Moulton (2015) the phrase that crosses the CP is AspP. In other analyses it might be some other category; the exact identity of this category is not so important here (but see section 4, where the position that the CP moves to is at issue).

2.2 The Rightward Movement Analysis

I will spell out a version of the traditional rightward movement analysis here (Rosenbaum 1967, Ross 1967, Reinhart 1980, Baltin 1982, Buring and Hartmann 1997, among many others). First, I assume that verbs that take

CP and PP arguments have the following structure:¹



The external argument is projected by Voice (Kratzer 1996), while the internal arguments are projected as shown, with the CP closest to the verb. The verb moves from V to Voice. The external argument typically moves to the surface subject position, Spec-TP. I adopt a version of the phase theory of Chomsky (2000), in which certain nodes, the *phasal nodes*, play an important role. In my version, the phasal nodes are VoiceP, CP, and NP. In the tree above, VoiceP is a phasal node.

Rightward displacement of a CP can cross a number of different types of arguments and adjuncts and so must carry the moving CP fairly high in the tree. I will assume for purposes of this paper that rightward movement can potentially target any node, but in the case below I will assume that it adjoins to VoiceP:

(3) You must disclose to the auditors in writing that you have had financial dealings with these companies.

¹Moulton (2015, note 17) claims that gerunds in English disallow many movement operations and so reflect the base order of complements. According to Stowell (1981), a CP complement must follow a PP complement inside a gerund:

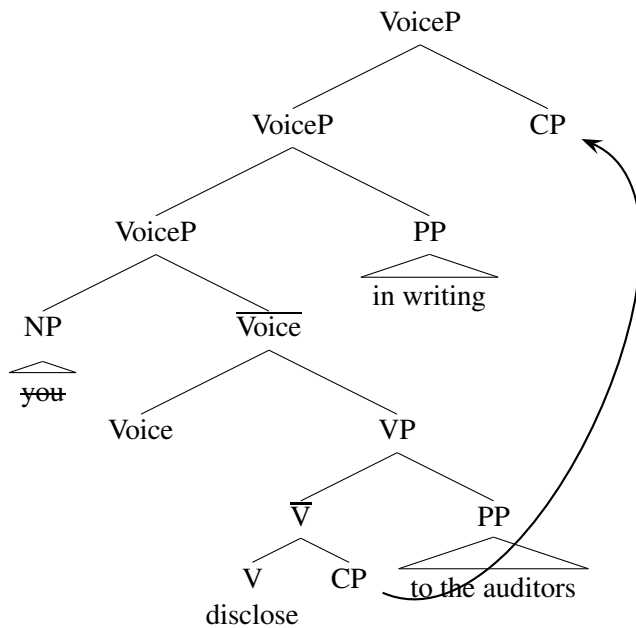
(i) (Stowell 1981, 109, (12))

- a. Did [Sally's mentioning to the doctor that there will be a problem] surprise you?
- b. * Did [Sally's mentioning that there will be a problem to the doctor] surprise you?

This would seem to indicate that CPs start to the right of PPs, a rather surprising conclusion. However, I disagree with this judgment, and find (ib) somewhat awkward, but not ungrammatical. If the CP is shorter while the PP is longer, this order seems absolutely fine:

(ii) That Sally was pregnant didn't surprise me, but [her mentioning that she was to one of her co-workers] did.

Gerunds do not appear to differ from finite clauses in this regard, and I see no reason to think that PPs start to the right of CPs.



This puts the CP rightmost in the clause. As I will show in section 4, CPs can also move even higher, as high as TP or CP. Importantly, in cases of adjunction to a phasal node, like VoiceP here, only the *highest* VoiceP counts as a phasal node.

3 Binding

I begin the empirical comparison of the two competing analyses with binding. Binding facts have been claimed to be incompatible with rightward movement (Zwart 1993, Moulton 2015). The basic fact is that (short) rightward displacement of a CP does not bleed binding, for instance Binding Condition C and binding of a pronoun by a quantifier:

- (4) a. *I proved to her₁ very easily that I was well disposed toward Melinda₁'s family.
- b. *I told her₁ on Tuesday that Melinda₁'s family was broke.
- (5) a. The director informed every janitor₁ in writing that he₁ was fired.
- b. The teacher told every girl₁ yesterday that she₁ needed to be on time.

This is also visible in SOV languages like German, where CP objects obligatorily shift to the right of the verb. In German, datives bind into CPs that are shifted to the right:

- (6) (Bayer 1995, 56, (17a–b))
 - a. ... weil der Direktor [jeder Putzfrau]₁ persönlich mitteilte [dass sie₁ entlassen sei].
 because the director each cleaning.lady personally told that she₁ fired was
 ‘... because the director told each cleaning lady₁ personally that she₁ was fired.’
 - b. *... weil der Direktor ihr₁ persönlich mitteilte [dass [die Putzfrau]₁ entlassen sei].
 because the director her personally told that the cleaning.lady fired was
 ‘... because the director told her₁ personally that the cleaning lady₁ was fired.’

The dative NP can be a quantifier binding a pronoun in the extraposed CP, and if it is a pronoun, it gives rise to a Condition C effect when coindexed with an NP within the CP.

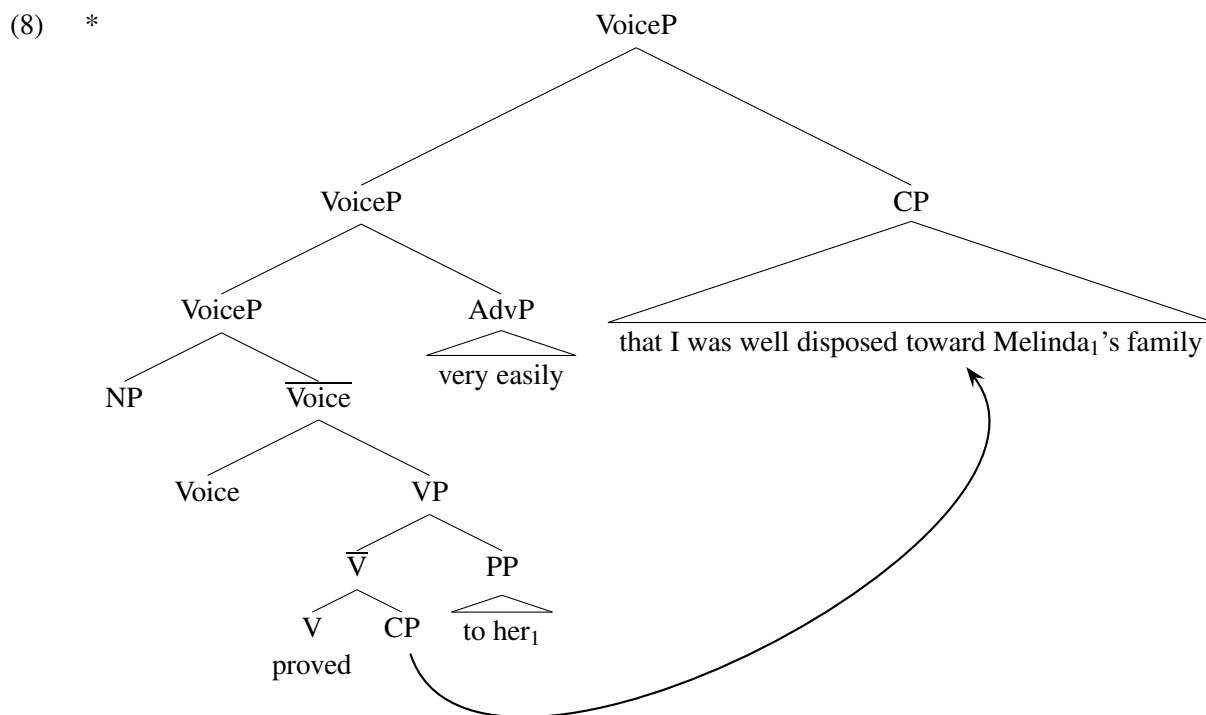
The argument here is that, if the CP had moved rightward as in (8), it would necessarily be outside the command domain of NPs within the VP. If movement is always upward, and binding depends on the relation of c-command, then movement of the CP should bleed binding, contrary to fact.

There is a logical issue with using this argument to decide between the leftward and the rightward movement analysis, which is that CPs move upward in the leftward movement analysis, too. I will return to this in a moment, when I compare rightward displacement of CPs with clear cases of remnant movement. First, though, I must show how binding actually works.

The argument against rightward movement depends on the assumption that binding relies on the structural relation of c-command. This is not correct, however, as was shown by Bruening (2014). Binding actually depends on the structural relation of *precede-and-command*, not c-command. Precede-and-command is the conjunction of two structural relations, precedence and phase-command:

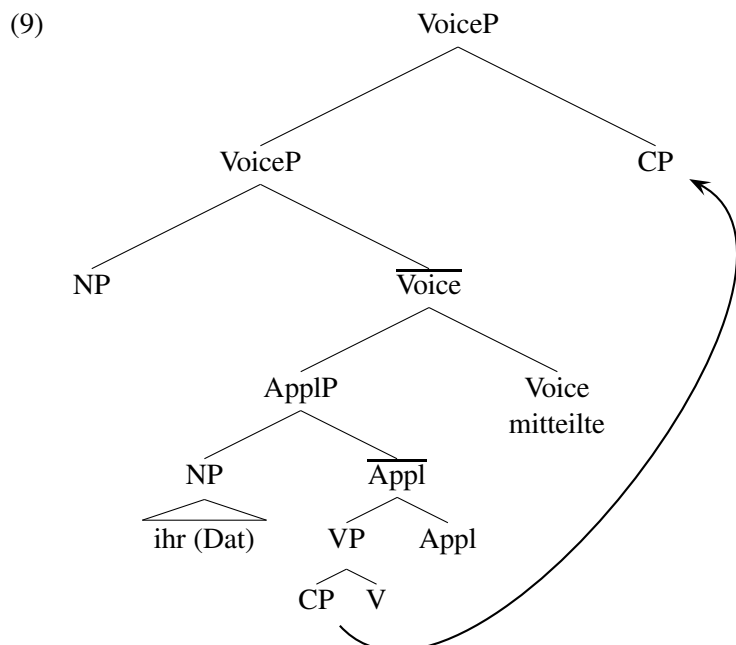
- (7) a. Binding: A binds B iff A and B are coindexed and A precedes and phase-commands B. (Bruening 2014, 344, (5))
- b. Phase-Command: X phase-commands Y iff there is no ZP, ZP a phasal node, such that ZP dominates X but does not dominate Y. (Bruening 2014, 343, (2))
- c. Phasal Nodes: CP, VoiceP, NP (modified from Bruening 2014, 343, (3))

Consider example (4a) in the rightward movement analysis, where the CP moves and adjoins to the VoiceP:



As stated above, in cases of adjunction, only the highest VoiceP is a phasal node. In this structure, there is no phasal node that dominates *her* and does not dominate the R-expression *Melinda*. The only phasal node that dominates the pronoun is the highest VoiceP, which also dominates *Melinda*. This means that the pronoun *her* phase-commands the R-expression (and the whole CP). Since it also precedes it, it precedes and commands the R-expression, and therefore can bind it. If *her* is coindexed with the R-expression inside the CP, as it is in (4a), then a Condition C violation results.

Binding is the same in German. Here is one possible analysis of the German sentences in (6), where the dative NP is projected by an Appl(licative) head (Marantz 1993), the CP adjoins to VoiceP, and the verb moves through Appl to Voice:



Only the highest VoiceP is a phasal node, so there is no phasal node that dominates the dative and does not dominate the CP. The dative therefore phase-commands the CP and also precedes it, giving rise to a Condition C violation. (In the actual example, the dative precedes an adverb; this means it has probably moved higher than its base position and probably outside the VoiceP, and from that position most definitely phase-commands the shifted CP.)

As for quantificational binding, quantifiers can bind pronouns as variables that they do not c-command or even phase-command, as Barker (2012) and Bruening (2014) show. In the cases shown above, the quantifier *does* phase-commands the pronoun that it binds, so there is absolutely no issue with quantificational binding.

Binding is therefore not problematic at all for the rightward movement analysis, once we recognize that binding depends on precede-and-command rather than c-command. Moreover, it is possible to show that binding facts are as predicted by the current account, but are actually problematic for the leftward movement analysis. As mentioned above, the CP also moves in the leftward movement analysis, and so that analysis also faces problems with binding if binding depends on c-command. Moulton (2015) proposes that the CP reconstructs to its original position for binding.² The rightward movement analysis could say the same thing, and then binding would simply not decide between the two analyses. However, the evidence to be presented below indicates that in fact there is no reconstruction. Binding is computed on the basis of the post-movement structure. This will be very problematic for the leftward movement analysis, which has no option other than to rely on reconstruction, since remnant movement necessarily has the result that nothing in the remnant c-commands out of the remnant.

Recall that in the leftward movement analysis, the CP first moves to the left, and then the phrase that it moved out of crosses over it. We should ask what happens with binding in cases where it is clear that this is indeed what is going on. To find out, we can look at partial VP fronting as a likely comparison case. We can strand a CP or PP that contains an R-expression, while moving the remnant VP with a pronoun coindexed with that R-expression. This coindexation is banned when nothing has moved, but becomes acceptable in partial VP fronting (Lechner 2003, Landau 2007, 148):

- (10) a. *He hinted to her₁ that he wants Melinda₁'s apartment when she moves.
 b. Hint to her₁ though he might that he wants Melinda₁'s apartment when she moves, she still won't give it to him.
 c. ... and hint to her₁ he must that he wants Melinda₁'s apartment when she moves, or she will never give it to him.
- (11) a. *I convinced her₁ of my good intentions toward Melinda₁'s family.

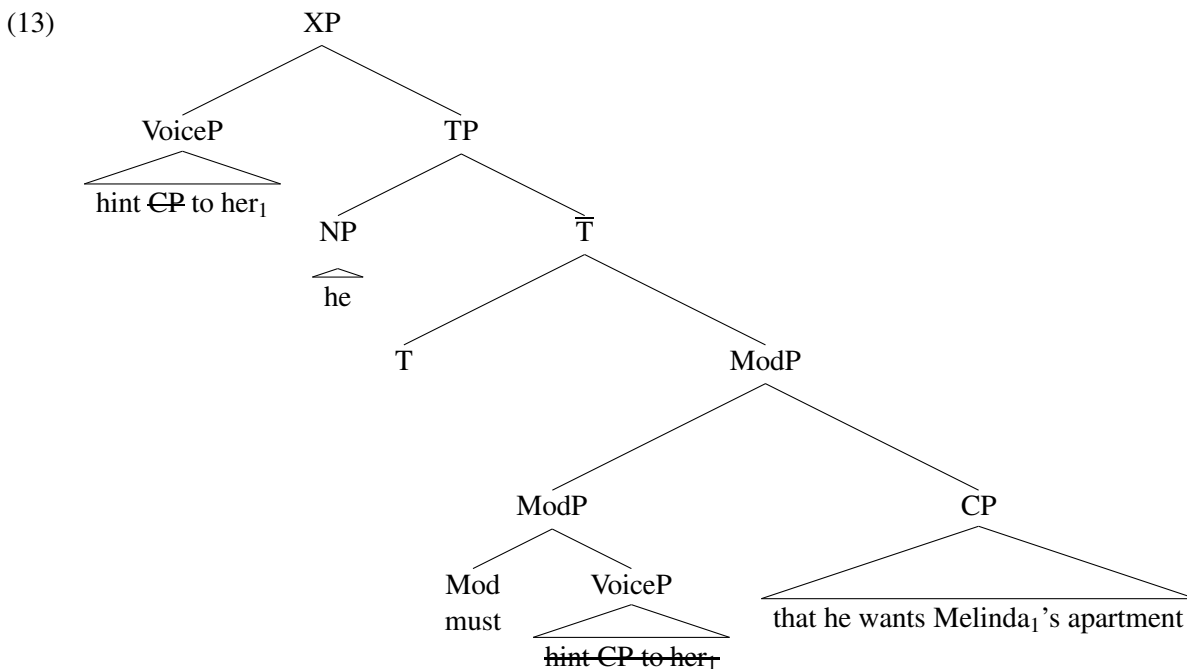
²Note that in the diagram in (1), the object of the P does not c-command the CP even in its base position. Moulton (2015) has to say that CPs actually start to the right of argument PPs; see note 1. Objects of Ps also have to be allowed to exceptionally c-command out of PPs.

- b. ... but convince her₁ I must of my good intentions toward Melinda₁'s family.
- (12) a. * John promised to give the books to her₁ on Mary₁'s birthday.
- b. John promised to give the books to her next year, and give the books to her₁ he did on Mary₁'s birthday. (Lechner 2003, (31))

That is, remnant VP movement bleeds Condition C: a pronoun in the fronted VP no longer binds into stranded material (PP or CP).³

The remnant movement analysis treats apparent rightward movement of CPs and PPs as almost identical to these cases of partial VP fronting. It is therefore mysterious why a Condition C effect would arise with apparent rightward movement but not with stranding plus VP fronting as in (10b), (11b), (12b). In particular, in order to explain the Condition C violations in (4) and (6b), the leftward movement analysis has to posit complete reconstruction of both the CP and the remnant phrase. We should then expect the same thing with partial VP fronting, and binding should behave as though no movement has taken place, contrary to fact.

In contrast, the rightward movement analysis can account for the facts, assuming that there is no reconstruction of the CP.⁴ I will adopt the view that only phasal nodes can move (e.g., Chomsky 2008). This means that remnant VP fronting is actually remnant VoiceP movement. It also means that a stranded PP or CP has to move out of the VoiceP in order for the remnant VoiceP to move and leave it behind. I show the CP adjoined to Mod(al)P here, but the exact location is not important, so long as it is outside the VoiceP:



There is then a phasal node, VoiceP, that dominates the pronoun but does not dominate the CP or PP (in both the moved position and the base position of the VoiceP). That is, it is because the stranded CP or PP has to vacate the VoiceP that remnant VoiceP movement affects binding. In the cases of rightward movement across low adjuncts in the previous section, movement is not forced to vacate the VoiceP phase. Following the logic of economy, a phrase is only allowed to move as far as it has to. If there is no VoiceP fronting, a moving CP will move only as far as it has to to get to the right, and will not cross the VoiceP. If VoiceP is going to front, however, leaving behind the CP, then the CP will have to move out of the VoiceP, and this will bleed binding.

³Pesetsky (1995) claimed that an element inside a fronted VP could still bind into a stranded phrase, but his only example involved an exempt anaphor. Exempt anaphors do not require binding (Pollard and Sag 1992). See Janke and Neeleman (2012) and Bruening (2014) for discussion. Phillips (2003) and Lechner (2003) added examples of quantificational binding, but quantifiers can bind pronouns that they do not c-command or even phase-command (Barker 2012, Bruening 2014; see also Moulton 2013 on binding into apparently moved CPs).

⁴It is possible and in fact likely that fronted VPs do have to reconstruct; see Heycock 1995. What is crucial here is that the CP not reconstruct.

Importantly, we can see from (10b), (11b), (12b) that CPs do not reconstruct. If they did, there would be a Condition C violation, because there is in the base position (the (a) examples). Movement bleeds Condition C, if the movement necessarily crosses a phasal node. We will see the same thing with simple rightward movement of CPs in section 4, when they cross material that must be high. This is fundamentally incompatible with the leftward movement analysis, since it has to rely on reconstruction to get binding to work.

Summing up this section, binding is problematic for the leftward movement analysis, since clear cases of remnant movement do not behave in the same way as rightward movement of CPs. It is then unlikely that rightward movement of CPs involves remnant movement, as it does on the leftward movement analysis. In contrast, the binding facts follow on the rightward movement analysis, once we recognize that binding depends not on c-command, but precede-and-command, and CP arguments do not reconstruct.⁵

4 Category Under Displacement

The next piece of evidence that I will present in favor of the rightward movement analysis involves syntactic category. Rightward displacement of CPs behaves very differently from leftward displacement of CPs. This is extremely hard to account for if rightward displacement were effected by leftward movement of the CP, for then it should act exactly like leftward movement.

Previous literature has shown that CPs displaced to the left can only be related to positions where NPs are allowed (e.g., Higgins 1973, Kuno 1973, Kaplan and Bresnan 1982, Postal 1994, Bresnan 1995, Alrenga 2005, Takahashi 2010). For example, they are ungrammatical with verbs that only permit CPs like *boast* and *hope*, but are grammatical with verbs or prepositions that only permit NPs:

- (14) a. * That she won the Pulitzer Prize, she is boasting.
(cf. She is boasting (*the fact) that she will win the Pulitzer Prize.)
- b. * That she will win, she is hoping.
(cf. She is hoping (*the fact) that she will win.)
- (15) a. That nouns and verbs are not distinct, we absolutely reject.
(cf. We absolutely reject *(the claim) that nouns and verbs are not distinct.)
- b. That she will win, we are all hoping for.

Displacement to the right shows a very different pattern. In such cases, CPs can only be related to CP positions, and not to NP positions (note that there is an independent ban against stranding prepositions by rightward movement, so I only show verbs here):

- (16) a. She was boasting over and over again that she would win the Pulitzer Prize.
- b. She hopes for all our sakes that she can defeat them.
- (17) a. We can attribute to magic *(the fact) that CPs can behave as NPs.
- b. We reject without equivocation *(the claim) that nouns and verbs are not distinct.
- c. We must explore in several different languages *(the possibility) that CPs might actually be NPs.

⁵It should be noted that extraposition from NP behaves very differently for binding from rightward movement of CP complements. As Buring and Hartmann (1997) show, extraposition from NP does not bleed Condition C, at least for a pronominal possessor within the NP that is extraposed from:

- (i) a. * Mary mentioned his₁ claim yesterday [that John₁ is intelligent]. (Buring and Hartmann 1997, 10, (15))
- b. * I thought about his₁ claim yesterday [that Peter₁ is often sick]. (based on Buring and Hartmann 1997, 11, (18b))

Buring and Hartmann (1997) argue for rightward movement of CPs, but also argue that CPs that move rightward obligatorily reconstruct for binding. They base this claim on extraposition from NP as in (i), however, not simple CP complement movement. All of the data here indicate that CP complements of verbs do not reconstruct. I will not address extraposition from NP here (but see Culicover and Rochemont 1990 for cases where extraposition from NP does bleed Condition C).

On the face of it, this indicates that movement to the right is very different from movement to the left. If all movement is leftward, it will be difficult to make the right distinction here.

Now, Moulton (2015) proposes an analysis that could potentially capture the distinction in syntactic category. Recall that in Moulton's version of the leftward movement analysis, the CP moves just above AspP, and then AspP moves over the CP. According to Moulton, the CP must move this high and no further because of the semantic types of the elements involved. Without going into details, a CP cannot move any higher than AspP because it has to remain within the domain of existential closure. According to Moulton, CPs that appear to be higher than AspP, for instance CP subjects or topics, have not moved as CPs. They are either base generated high and are related to null operators that are NPs (Alrenga 2005, Moulton 2013); or, they themselves are NPs, not CPs (Davies and Dubinsky 2009, Takahashi 2010). NPs have a different type, and therefore combine in a very different way from CPs. This explains why leftward displacement of CPs is only possible from positions that allow NPs. CPs can move as high as AspP and no higher, and in fact must move to AspP. So, if they appear to have moved to the right, by virtue of having moved to AspP and then having AspP cross them, they are actually CPs. If they are anywhere else, they must be NPs. This appears to capture the leftward-rightward distinction in syntactic category.

The problem with this is that CPs can be shown to be able to move quite high in English, if they are on the right. English has a class of adjuncts that appear high on the right (Reinhart 1981). These are high enough that they can strand in sluicing (Bruening 2014), which is usually taken to be ellipsis of TP (e.g., Merchant 2001):

- (18) A: Someone will say that.
B: Who, with their mother hanging around?

A CP can appear to the right of one of these high adjuncts, and this is true even with verbs that do not take NP complements and only permit CP complements:

- (19) Marissa wouldn't say to her fiancé with her mother hanging around that she loved him.
(20) a. No one would boast with their mother hanging around that they had been tormenting the neighborhood children.
b. *No one would boast their torments.

Importantly, binding evidence shows that CPs that move this high behave very differently from CPs that move only a short distance. Movement of a CP above a high adjunct bleeds Condition C (these contrasting judgments have been verified with six native speakers of English):

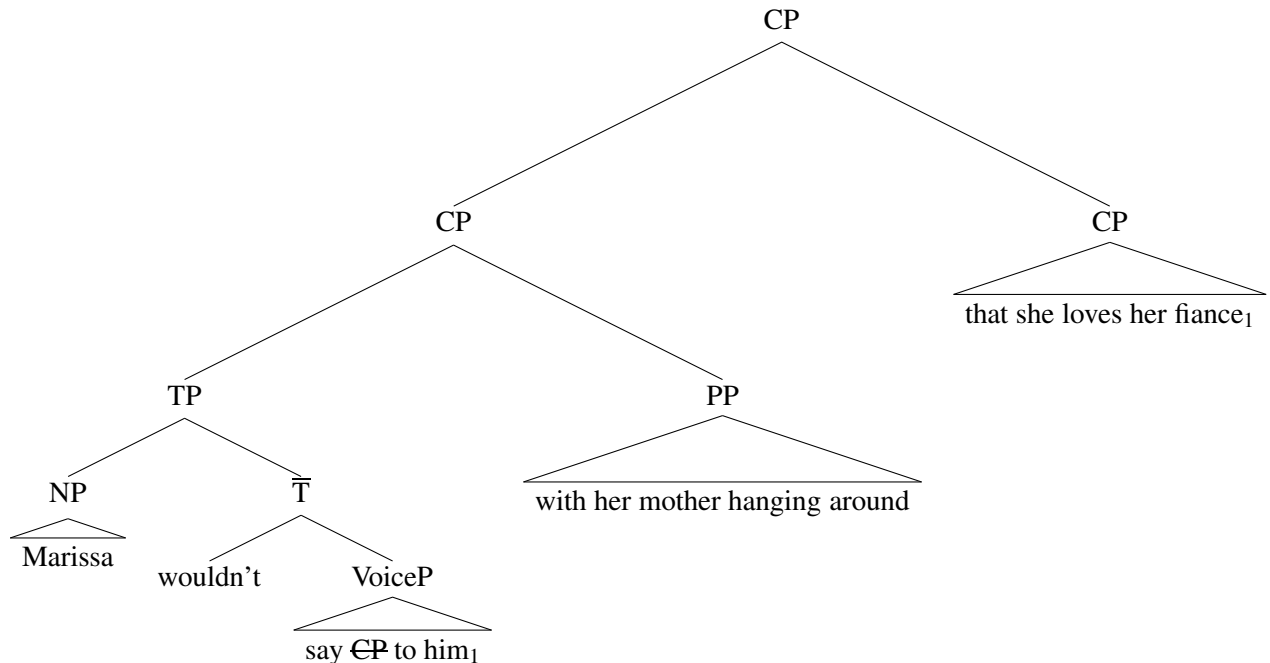
- (21) a. Marissa wouldn't say to him₁ with her mother hanging around that she loves her fiancé₁.
b. *Marissa wouldn't say to him₁ that she loves her fiancé₁.
(22) a. Would Ms. Jones disclose to him₁ with the auditors breathing down her neck that she has a conflict of interest regarding her new client₁?
b. *Would Ms. Jones disclose to him₁ that she has a conflict of interest regarding her new client₁?
(23) a. I won't tell her₁ with her children listening that Melinda₁'s family has lost everything.
b. *I won't tell her₁ that Melinda₁'s family has lost everything.

This indicates that the CP has moved out of the VoiceP and to a high position, since it is no longer in the binding domain of the pronoun. As we saw in the previous section, shorter rightward movement does not have this effect. (See also Culicover and Rochemont 1990, who note similar cases of rightward movement ameliorating Condition C.)

CPs, then, can demonstrably move much higher than AspP and still be CPs. This makes Moulton's account unworkable: movement as a CP past AspP is supposed to be impossible. Also important is the conclusion that CPs can target more than one position on the right. In Moulton's analysis, there is one and only one position that CPs can occupy, given the semantic composition. This cannot be correct, since CPs can occupy at least two positions, one within VoiceP, and one outside it (partial VP fronting showed us the same thing).

These data show us again that CPs do not reconstruct for binding. Short rightward movement of CPs does not bleed Condition C, because it does not vacate the smallest phasal node, VoiceP. This was shown in the previous section. If the CP crosses material that is high, however, like the high adjuncts here, then it necessarily crosses the phasal node, changing binding relations. I will assume that the CP adjoins to the CP node in such cases (so that the TP can elide in sluicing, stranding the adjunct and/or the CP):

(24)



In this structure, there is a phasal node, VoiceP, that dominates the pronoun and does not dominate the CP. The pronoun therefore does not phase-command the R-expression inside the CP, and there is no Condition C violation. If there were reconstruction, however, there would be a Condition C violation, since the CP would be back within the VoiceP where it would be phase-commanded by the pronoun.

Recall that we saw the same thing with partial VP fronting: In order to strand, the CP had to move out of the VoiceP, and this bled Condition C. The generalization is that movement out of the VoiceP bleeds Condition C. Now we see that CPs can move even higher, out of the TP, since the TP can elide while stranding the type of adjunct that the CP has moved across.

Note that in the structure above, the subject does phase-command the moved CP. In cases of adjunction, only the highest node is a phasal node. There is therefore no phasal node that dominates the subject *Marissa* and does not dominate the moved CP. This means that we still expect a Condition C violation if the subject is the pronoun coindexed with the R-expression in the moved CP, even though the CP has moved higher than the subject. This is correct, as an anonymous reviewer points out:

(25) * She₁ wouldn't say to me with lots of people around that Susanna₁ loves her fiance.

See Bruening (2014, 351–352) for discussion of such facts. They show that c-command is not the right relation for binding, because the subject does not c-command the CP (as can be shown with constituency tests like ellipsis and coordination).

To sum up this section, CPs can move quite high to the right, and when they do, their category is CP. Binding works as expected if they are moving up and to the right, if there is no reconstruction and binding depends on precede-and-command. When CPs move to the left, in contrast, their category is NP. It is entirely unclear how a theory could capture this distinction when it holds that all movement is movement to the left. If all movement is to the left, then the only way to distinguish types of movement is in the position of the landing site. This is the approach that Moulton (2015) took: CPs can and must move to AspP but can move no further; anything moving higher than that must be an NP. But the facts indicate that rightward movement is not limited in height in such

a way. There are at least two different positions that a CP can move to on the right, with binding distinguishing between them. In fact, there is nothing in the leftward movement analysis that can distinguish leftward movement of a CP to the edge of the local CP (e.g., 14) from rightward movement to the edge of the local CP (e.g., 24). Yet they behave very differently: CPs moved to the left must be NPs, but CPs moved to the right must be CPs. I conclude that a leftward movement analysis is untenable, since it has no principled way to distinguish when CPs must be CPs and when they must be NPs.

At this point, I admit to having no good explanation for why leftward movement of CPs must actually involve NP categories, but rightward movement must involve CPs. However, the rightward movement analysis can at least describe the facts, since it has a way of making the right cut: directionality. In the rightward movement analysis, leftward and rightward movement can be distinguished on the basis of directionality, even if they cannot be distinguished by height. It is therefore possible to capture the difference regarding syntactic category, and, eventually, explain it. In contrast, on the leftward movement analysis, there is simply no way to make the distinction.

5 Preposition Stranding

Moulton (2015) claims that preposition stranding in English constitutes an empirical argument for the leftward movement analysis. It has long been observed that shifting a CP complement rightward across a PP makes stranding the P head of that PP impossible (Kuno 1973, 382, Wexler and Culicover 1980, Stowell 1981; Kuno attributes the original observation to Judith Aissen):

- (26) (Stowell 1981, 208, (177))
- a. * Who did you say to that I would buy the guitar?
 - b. * Who will Andrews disclose to that he is married?

Shifting of CPs is supposed to pattern with heavy NP shift (Fodor 1978):

- (27) (Stowell 1981, 211, (185))
- a. * Jim, I said to a few words about his workmanship.
 - b. * Who will he disclose to his marriage with Jane?

Moulton (2015) proposes that this follows from the remnant movement account. Both CPs and heavy NPs move leftward, followed by remnant movement of AspP. The PP is located inside the AspP, and so cannot be extracted from, since (some) moved phrases are islands to extraction (Wexler and Culicover 1980; see more on this in section 6). We know that a PP inside a fronted constituent like a VP cannot be extracted from, for instance:

- (28) a. She said that [_{VP} talk to him] though we might, it will make no difference.
 b. * Who did she say that [_{VP} talk to *t*] though we might, it will make no difference?

So, Moulton (2015) accounts for the P-stranding effect as following from a constraint that bans extracting from a moved constituent (see Corver 2006 for discussion of such *freezing effects*). In this case, AspP has moved, and so a PP within it cannot be extracted from. Note that the constraint against moving out of a phrase that has already moved has to be much more nuanced, because the CP that moves first can be extracted from (see section 6). In addition, in Moulton's analysis, if the PP moves first, it can also be extracted from. This is supposed to be what happens when the PP follows the CP, as in the following example (I use my own example, as Moulton's was not very good, in my judgment):

- (29) a. A: I already said that I would!
 b. B: OK, but who did you say that you would TO? (Depending on who it was, we might be able to get you out of it.)

Drummond (2009) presents the following example as grammatical without any special prominence, which I agree with:

(30) Who did you suggest that John should leave to? (Drummond 2009, (13a))

What Moulton suggests is that AspP has undergone A-bar movement, and so constituents within it cannot themselves undergo A-bar movement. This is why the examples in (26–27) are bad. In contrast, when the CP moves first, or if the PP moves first, as in (29b) and (30), it undergoes A-movement, and so is not an island to A-bar extraction (see Müller 1996, Abels 2008). I will discuss this idea in more detail in section 6. First, I raise analytical and empirical issues involving P-stranding, and propose an alternative analysis.

5.1 Analytical Problems

A problem for the freezing account is that the order PP–CP is possible even when VP fronting has taken place, stranding both the PP and the CP:

- (31) a. Complain though he will to anyone who will listen that he has been treated most unfairly, it will make no difference.
b. Hint though she might to all her superiors that she deserves a raise for all her hard work, it will make no difference.

In Moulton’s analysis, the PP usually gets to the left of the CP by being moved along with the AspP remnant. But then moving the verb minus the PP to a higher position should not be possible. Either the verb would have to move out of AspP, or the PP would have to move out and the remnant then move further. Either derivation would violate the ban on moving out of a constituent that has undergone movement already.

Now, Moulton does allow (footnote 19) the PP and the CP to both move out of AspP, in either order. Permitting this would permit the examples in (31), provided that the remnant is permitted to move after both the PP and the CP have moved out of it. The issue that this causes is that it loses the account of the blocking of P-stranding in (26). Recall that moving the PP first permits the complement of the P to extract in Moulton’s account, as in (29b). If this extraction can place the PP to the left of the CP, as is necessary for the VP fronting examples in (31), then the examples in (26) should also have such a derivation available to them. But then extraction of the complement of the P should be grammatical, contrary to fact.

These issues indicate that the proposed account actually does not succeed in explaining the P-stranding data. The P-stranding data are therefore not an argument in favor of the leftward movement analysis.

5.2 Problems with the Judgments

Furthermore, the judgments regarding P-stranding in the presence of a rightward-shifted CP are actually not as robust as the literature has characterized them. First, my own judgment as a native speaker of English is that the sentences in (26) are indeed unacceptable, but simply adding material in between the stranded P and the CP improves them considerably:

- (32) a. Who did she say to on Tuesday that she would leave on Thursday?
b. That’s the person that you need to make clear to before you can leave that you truly feel remorse about your actions.
c. That’s the guy that she shouted to down the stairs that she was in love with him.
d. Who did she hint to in a very subtle way that she wanted to dance?
e. Which official does he need to disclose to in writing that he is married?

However, an anonymous reviewer did not share this judgment, so I decided to check it in a small survey, following the guidelines in Mahowald *et al.* (2016). I was surprised to find that the original judgments in (26) were not shared by all speakers of English. Two of six respondents actually found such sentences entirely well-formed (4 or 5 on a scale of 1 to 5). The others ranged all over the scale of acceptability. I therefore decided to do a large-scale acceptability survey using Amazon Mechanical Turk, to test both the original judgment, and the judgment that the presence of extra material improves preposition stranding.

5.3 Survey using Amazon Mechanical Turk

I made use of the free tools described in Gibson *et al.* (2011) and available at <http://tedlab.mit.edu/software/>, modified for the purposes of this experiment. The experiment used a 2x2 design with factors *Preposition Stranding (Strand)* versus *Pied-Piping (PPipe)* (the literature universally judges pied-piping to be completely acceptable), and *Extra Material (Extra)* versus *No Extra Material (None)*. Sentences were constructed in sets of four, on the following paradigm:

- (33) a. Strand-Extra: I don't know who she said to on Tuesday that she would leave on Thursday.
- b. Strand-None: I don't know who she said to that she would leave on Thursday.
- c. PPipe-Extra: I don't know to whom she said on Tuesday that she would leave on Thursday.
- d. PPipe-None: I don't know to whom she said that she would leave on Thursday.

Sentences were either embedded wh-questions, as above, or relative clauses, like the following (approximately equal numbers of each):

- (34) a. Strand-Extra: That's the person that you need to make clear to before you can leave that you truly feel remorse about your actions.
- b. Strand-None: That's the person that you need to make clear to that you truly feel remorse about your actions.
- c. PPipe-Extra: That's the person to whom you need to make clear before you can leave that you truly feel remorse about your actions.
- d. PPipe-None: That's the person to whom you need to make clear that you truly feel remorse about your actions.

I did not use matrix questions, because subjects also answered a comprehension question about each sentence that they judged, and I did not want them to be confused about what question they should answer.

Twelve sets of sentences were constructed. The complete list of items appears in the appendix. Each subject saw only one member of each set. Subjects answered a comprehension question about every sentence and also rated every sentence on a scale of one to five, as follows: 1: Extremely unnatural, 2: Somewhat unnatural; 3: Possible, 4: Somewhat natural, 5: Extremely natural. The survey also included 24 filler or control sentences that were intended to be matched for register and style. These were created by modifying examples taken from the web, typically on-line newspaper articles. Each of the 24 was manipulated to create an ungrammatical match, where the manipulation was changing the word order of S, O, or V. A couple of examples follow (the ungrammatical sentences were not presented with the star):

- (35) a. A preliminary injunction was granted on Thursday, so the permit requirement can no longer be enforced until the case has been heard.
- b. * A preliminary injunction on Thursday granted was, so the permit requirement can no longer be enforced until the case has been heard.
- (36) a. Several landmarks in Milwaukee's parks were included as points of interest in Pokemon Go when it launched in 2016.
- b. * Several landmarks in Milwaukee's parks were included as points of interest in Pokemon Go when it in 2016 launched.

As stated, there were 24 pairs of controls, and again each subject saw only one member of each pair. Subjects rated a total of 36 sentences (12 experimental items + 24 control items). A different list was created for each subject with the presentation order randomized.

100 subjects were recruited from within the USA. All 100 identified themselves as being from the USA and having English as their native language. Three subjects were discarded from the analysis for getting less than 75% of the comprehension questions correct. That left 97 whose results entered into the analysis.

Mean ratings and standard deviations are shown below (again, the scale is 1–5, 1: Extremely unnatural, 2: Somewhat unnatural; 3: Possible, 4: Somewhat natural, 5: Extremely natural):

(37)	PPipe-Extra	PPipe-None	Strand-Extra	Strand-None	control	ungramm
mean	2.947368	3.225352	2.670175	2.915789	4.340650	2.184211
SD	1.1721692	1.1272053	1.1336661	1.1808015	0.9382648	1.2135161

The mean acceptability ratings of all of the experimental sentences are surprisingly low. Even the pied-piping sentences, which the theoretical literature judges to be completely grammatical, are rated very low. I attribute this to two factors: complexity (all of the sentences are long and syntactically complex), and a general dispreference in contemporary spoken English for pied-piping. Even more striking, however, is how little the experimental sentences differ from each other. The condition that the literature is unanimous in considering ungrammatical, Strand-None, is only 0.3 points below the highest-rated condition, PPipe-None, and is rated 0.8 points *higher* than the ungrammatical controls. It is also almost identical in rating to PPipe-Extra, which should be completely grammatical, according to the previous literature.

Statistical analysis was run using R (R Core Team 2012). Responses were analyzed by means of linear mixed-effect modeling using the R-package lme4 (using lmer). The two fixed effects in the analysis were stranding vs. pied-piping (Strand) and extra material vs. none (None). The analysis included random intercepts for both subjects and items. Table 1 shows the results.

Table 1: Summary of fixed effects in the mixed-effects model for the experiment

	Estimate	Std. Error	t value
(Intercept)	2.95399	0.11807	25.018
Strand	-0.28878	0.08042	-3.591
None	0.27082	0.08048	3.365
Strand:None	-0.02096	0.11379	-0.184

An exact p-value cannot be calculated, but we can take a t-value whose absolute value is greater than 2 to be statistically significant (Baayen 2008, 248). As can be seen in the last column of table 1, both main effects are significant, but there is no interaction. Basically, pied-piping increases mean acceptability by 0.3 points over P-stranding, while adding extra material decreases it by 0.3.

The effect of extra material is probably just an effect of length: longer sentences are generally rated lower. I therefore do not attach any theoretical significance to this finding.

Further analysis does not reveal any effect of relative clauses versus questions. In particular, pied-piping was not judged to be more acceptable in relative clauses than in embedded questions. There are also no clear item differences. However, analysis of the participants reveals that there are subjects like me who rate Strand-Extra better than Strand-None. In fact, 29 out of 97, or 30%, patterned in this way. There are also subjects who rate Strand-None very high: 21 rated Strand-None 3.667 or higher, and 14 of those rated it 4 or higher (recall that in the initial informal survey, 2 out of 6 speakers rated Strand-None 4 or higher). This means that 22% of the population does not find P-stranding unacceptable in the presence of a rightward-shifted CP, as the literature has unanimously claimed. That is, 22% of the population finds examples like the following fully acceptable:

(38) % Who did you say to that I would buy the guitar? (Stowell 1981, 208, (177))

Almost the same number (22) rated Strand-None 2 or lower. That is, the number of people who find such sentences fully acceptable is approximately equal to the number of people who find them fully unacceptable. The majority of speakers are somewhere in the middle, rating them just below 3 on a 5-point scale.

In short, the main finding of the survey is speaker variability. Approximately 20% of the population agrees with the judgment in the literature and finds P-stranding unacceptable when a CP is to the right of the P, but another 20% finds this fully acceptable. The majority of speakers rate such sentences in the middle of the acceptability scale, below fully grammatical control sentences but above clearly ungrammatical control sentences. There is only

a small (but significant) difference between P-stranding and pied-piping, contrary to the stark contrast reported in the literature.

5.4 An Alternative Analysis of P-Stranding Judgments

I suggest that the judgments here are not a matter of grammar, but rather of acceptability. There is so much individual variation that it seems most likely that the judgments in this domain are about processing, complexity, familiarity, and tolerance for deviation from canonical ordering, all of which differ from speaker to speaker. In fact, Fodor (1978, 449) proposed that the unacceptability of P-stranding with heavy NP shift in (27) was about processing: it was a violation of the Nested Dependency Constraint. I will not adopt this proposal for rightward-shifted CPs, but do agree with Fodor that the relevant constraints are not grammar.

First, I propose that there *is* a hard grammatical constraint against stranding a preposition if the PP that it heads moves outside of the VoiceP it starts in, either on its own or as part of a larger constituent (see, e.g., Postal 1972; Koster 1978, 573; Wexler and Culicover 1980). As we saw above, a PP that fronts as part of a VP cannot be extracted from (examples repeated from above):

- (39) a. She said that [_{VP} talk to him] though we might, it will make no difference.
b. * Who did she say that [_{VP} talk to *t*] though we might, it will make no difference?

Leftward movement of a PP to a high position also blocks P-stranding:

- (40) a. * Whose heads do you think that over we should put a sack?
(cf. I think that over their heads we should put a sack.)
b. * Which bridge did he say that under is living a troll?
(cf. He said that under that bridge is living a troll.)
c. * What weapon did the sorcerer say that with we can slay the dragon?
(cf. The sorcerer said that with this weapon we can slay the dragon.)
d. * Who did she say that next to she saw a gun?
(cf. She said that next to the man she saw a gun.)

Rightward movement sometimes blocks P-stranding. If the PP crosses one of the high adjuncts from section 4, P-stranding is very unacceptable:

- (41) a. * What did Sarah shout without taking a breath about?
(cf. What did Sarah shout about without taking a breath?)
b. * What were so many people shouting that they couldn't be heard about?
(cf. What were so many people shouting about that they couldn't be heard?)
c. * What does Samantha not talk to friends with her mother around about?
(cf. What does Samantha not talk to friends about with her mother around?)

This is because the PP has crossed VoiceP.

Within VoiceP, in contrast, we see variable judgments. My own judgment is that the following examples are very unacceptable:

- (42) a. * Who did you speak on Thursday to?
b. * What did they depend last summer on?
c. * What did they put the knives yesterday in?
d. * What did she jump yesterday over?
e. * What are you looking with a microscope for?
f. * What person was she debating at the podium with?

However, Johnson (1991, 582–583, (14)) reports that the following examples are completely acceptable, a judgment I do not agree with:

- (43) a. This is what Bill has looked recently at.
b. That's the one who Bill relied stupidly on.

Thus, there is clearly speaker variability. Moreover, Keir Moulton points out (personal communication) that certain cases of multiple PPs seem to permit stranding on either order:

- (44) a. What bus did you ride to Cambridge on?
b. What city did you ride on the bus to?

With different PPs or different verbs, P-stranding possibilities change, but there is also considerable speaker variation here (these judgments are mine):

- (45) a. What girl did you sing to on the bus?
b. ?? What girl did you sing on the bus to?
c. What bus did you sing to a girl on?
d. ?? What bus did you sing on to a girl?
e. * What bus do you ride on Tuesdays on?
f. * What city did you ride last week to?

With the preposition *about*, we see even more variability. Drummond (2009, (20c)) gives the following example as only marginally degraded:

- (46) ? Who did John talk to Bill yesterday about?

Hornstein and Weinberg (1981, 59, (19b)) present an almost identical example as ungrammatical. I have gotten mixed judgments from native speakers. With a different preposition, acceptability declines significantly, at least in my judgment:

- (47) a. ? What is Sarah shouting in her room about?
b. * Who is Sarah shouting in her room at?

Some speakers also judge certain low manner adverbials to be able to come between a verb and a stranded P:

- (48) a. ? Who is Sarah shouting so loudly at?
b. ? What bus do you ride only reluctantly on?
c. ? That's the barrier that she jumped nimbly over.

The following examples were presented by Johnson (1991, 582–583) as fully acceptable (I find all but (49b) marginally acceptable, while (49b) is perfect):

- (49) a. Which girl did Betsy talk quickly about?
b. Who must you speak loudly to?
c. Which department has Sam talked repeatedly to?
d. Which child did you look diligently for?
e. Who did you bake it quietly for?

Given this variability, I propose that, as far as the grammar is concerned, Ps can be freely stranded anywhere within the VoiceP. However, this is more or less acceptable to particular speakers depending on several factors. One factor is whether the PP is an argument or an adjunct. Another factor is what the P is, and what the V is. A factor of great importance for explaining the pattern with rightward-shifted CPs (our main concern here) is whether the PP is in its base position or canonical order with respect to other elements within the VoiceP. P-stranding is always acceptable if the PP is in its base position and its canonical order relative to everything else. This is why most speakers find P-stranding after a CP acceptable (if relative weight is compensated for):

- (50) a. A: I already said that I would!
b. B: OK, but who did you say that you would TO? (Depending on who it was, we might be able to get you out of it.)

This is the base position for both the CP and the PP, by assumption (although it is not the canonical position, since CPs prefer to shift to the right).

If the PP is reordered with respect to other material, then acceptability of P-stranding declines, but to different degrees for different individuals, and it also depends on what that other material is. With CPs, the majority of speakers disprefer reordering the PP and CP from their base positions. In the rightward movement analysis, the CP has moved across the PP in the following examples:

- (51) (Stowell 1981, 208, (177), judgments changed)
a. % Who did you say to that I would buy the guitar?
b. % Who will Andrews disclose to that he is married?

For most speakers, the fact that the CP and the PP have changed from their base order decreases the acceptability of stranding the P. For approximately 20%, however, it does not. Possibly this is because CPs occur after such PPs with almost overwhelming frequency, although this is a derived order; for these speakers, canonical order matters more than base order.⁶

As noted above, approximately 30% of speakers find that extra material between the stranded P and the CP improves acceptability:

- (52) a. % Who did she say to on Tuesday that she would leave on Thursday?
b. % Who did she hint to in a very subtle way that she wanted to dance?

In these cases, the PP whose P is stranded has been reordered with respect to the CP, but not with respect to the PP that comes between them. I suggest that in this case, those two ordering facts cancel each other out. The PP comes first, so the parser sees that the stranded P is in its canonical position with respect to the following PP before it ever encounters the CP. For the speakers who feel this effect, this makes the canonical ordering of the two PPs outweigh the change in ordering of the stranded P and the CP, and those speakers find the sentences acceptable. For other speakers, it does not, and the sentences are as marginal as those without the intervening PP (or slightly worse, since they are longer and more complex).

This non-grammatical account therefore captures the variability in judgments that we see regarding P-stranding. The factors involved are about deviations from base order and from canonical order, but they differ from speaker to speaker.

5.5 Summary

P-stranding does not constitute an argument for the leftward movement analysis. The explanation proposed by Moulton (2015) for the pattern of judgments actually does not work, and the judgments themselves turned out in

⁶I did not test heavy NP shift as in (27) in the Amazon Mechanical Turk survey. However, informal polling indicates that most speakers find P-stranding with heavy NP shift much worse than with CPs. In the analysis proposed here, this follows from the fact that CPs canonically follow PPs in surface word order, even though this is a deviation from the base order. NPs, however, canonically precede PPs. Heavy NP shift therefore reorders the NP and the PP from both the base order and the canonical surface order, making P-stranding highly dispreferred.

a large-scale survey not to be accurate. I proposed an analysis that accounts for the significant speaker variability that we see in judgments on P-stranding. This analysis takes the variation to be variation in acceptability, not grammaticality. Importantly, it is compatible with the rightward movement analysis (in fact it is completely neutral, as it is only about surface word order).

6 More on Extraction

CPs that have moved rightward are permeable to extraction. For instance, in English, a CP that has moved rightward across both an argument PP and an adjunct PP can still be extracted from:⁷

- (53) Which politicians do you need to disclose to the agency in writing that you have had financial dealings with?

Extraction is also possible when the CP has crossed one of the high adjuncts from section 4:

- (54) Who would she not say with her co-workers hanging around that she had gone on a date with?

One might offer this permeability to extraction as evidence against the rightward movement analysis, if one has reason to think that phrases that have undergone movement are islands to extraction (see Buring and Hartmann 1997, Moulton 2015). However, our concern here is comparing the leftward movement analysis and the rightward movement analysis. The CP undergoes movement in both of those analyses. Extraction facts are therefore not something that could distinguish between the two analyses, at least not without a more nuanced theory of when movement of a phrase blocks extraction out of that phrase.

A few remarks are in order, however. First, we have seen ample evidence, from word order and binding, that CPs that have undergone rightward displacement have in fact moved. The fact that they are permeable to extraction therefore requires that not all moved phrases be islands to extraction. It simply cannot be the case that moving a phrase automatically turns it into an island (something all the literature agrees upon, see Corver 2006 for a summary).

Second, recall that Moulton (2015, 334) suggested, following Müller (1996) and Abels (2008), that extraction out of a moved constituent is related to the A- vs. A-bar status of the movements involved. A constituent that has undergone A-movement is an island to A-movement out of it but not A-bar movement, while a constituent that has undergone A-bar movement is an island to A-bar movement but not A-movement. On this view, then, movement of a CP must be A-movement, since it permits A-bar movement as in (53). This movement must be A-movement even when it moves across a high adjunct, as in (54).

This approach would then lead us to expect movement of clauses to block A-movement, since the movement of the clause itself is A-movement. Unfortunately, finite CPs do not permit A-movement out of them at all, whether they have moved or not, so we cannot test whether rightward CP movement would block A-movement. However, rightward movement of a non-finite clause does not block A-movement in raising constructions:

- (55) a. James seemed to everyone on Saturday to be even fatter than he was on Friday.
b. There seemed on Saturday night to be little chance of a race on Sunday.
c. The prosecutor proved the defendant beyond a shadow of a doubt to have been at the scene of the crime.

I see no reason to think that rightward movement of a non-finite clause would be any different from rightward movement of a finite clause (both are clause-bound, for instance), so it is doubtful that moving a finite CP would block A-movement as predicted. Moreover, one could not say that movement of the non-finite clause in (55) is A-bar movement instead, because it also does not block A-bar movement:

- (56) a. What did James seem to everyone on Friday to have trouble recognizing?

⁷Kuno (1973, 365, note 1) says that extraction from a CP that has shifted across an adverb is marginal (he gives his examples two question marks), but this does not accord with my judgment.

- b. —a course for which there seemed at first sight to be insufficient legal warrant. (Hans Kelsen, *The Law of the United Nations: A Critical Analysis of Its Fundamental Problems*, p117, accessed by Google Books.)
- c. Where did the defense lawyer prove the defendant beyond a shadow of a doubt to have been at the time of the crime?

In these examples, the rightward-dislocated clause permits both A-movement and A-bar movement simultaneously. This is an insurmountable problem for the view that any moved phrase will always block one type of movement (the type that it underwent).

These considerations lead to the conclusion that there is simply no general grammatical constraint against extracting out of moved phrases, not even one relativized to the type of movement. The rightward movement analysis therefore does not face any difficulty from extraction.

We might also want to compare partial VP fronting again. In the leftward movement analysis, the CP moves to the left, and is then crossed by a remnant phrase. This is exactly like partial VP fronting. But extracting from a CP that has been stranded by partial VP fronting is not very acceptable:

- (57) a. She said that hint to her though he might that he wants a raise, she will never give him one.
 b. *That large a raise, she said that hint to her though he might that he wants, she will never give it to him.

It may be that this is not due to any grammatical constraint, but instead to difficulty in processing. But then it is unclear why apparent rightward movement of CPs does not face the same processing difficulty, since it involves an almost identical structure and derivation in the leftward movement account.

I conclude that extraction is not an issue at all for the rightward movement analysis. There is no constraint against moving out of phrases that have themselves moved, not even one relativized to the type of movement. The leftward movement analysis again has to explain why apparent rightward dislocation of CPs does not pattern with CP stranding in VP fronting.

7 Conclusion

This paper has shown that the rightward movement analysis of rightward dislocation of CPs is superior to the leftward movement analysis. Binding facts, in particular, are incompatible with the leftward movement analysis, but are exactly as predicted by the rightward movement account, if binding relies on precede-and-command rather than c-command (Bruening 2014). CPs also do not reconstruct, as they would have to on the leftward movement analysis. The facts discussed here show us that elements on the right can be structurally higher than elements on the left. Thus, this paper can be seen as an argument against antisymmetry approaches to phrase structure (Kayne 1994). Given the success of rightward movement plus precede-and-command, it is also an argument in favor of precede-and-command as opposed to c-command in binding.

The paper also showed a fundamental asymmetry between leftward and rightward movement of CPs in syntactic category. It does not appear to be possible to capture this difference in purely structural terms, instead the difference is due entirely to directionality. This is also incompatible with leftward movement and antisymmetry, as well as approaches to grammar that try to locate linear order only in a post-syntactic component of grammar (e.g., Kayne 1994, Chomsky 2000, Fox and Pesetsky 2005).

Finally, the P-stranding data ought to serve as a cautionary tale. The judgments that had been unanimously agreed upon by the syntactic literature (including the first draft of this paper) turned out not to be representative of the general population of native English speakers. As many people had the exact opposite judgment as had the judgment reported in the literature. The stark contrast reported in the literature between stranding and pied-piping was also much smaller than reported, and most speakers actually found both of them marginal. I proposed that such speaker variability is best accounted for by non-grammatical constraints on acceptability. Similar proposals have been made for variable judgments in other domains, for instance, in extraction (e.g., Kluender 1992, Kluender and Kutas 1993, Hofmeister and Sag 2010, Chaves 2012) and VP anaphora (Miller 2011, 2013; Kertz 2013;

Bruening 2017). Researchers should not take any judgments at face value, even ones they strongly share, but should find multiple sources of evidence both for the judgments and for their hypothesized source.

8 Appendix: Experimental Items

- (58) a. Strand-Extra: I don't know who she said to on Tuesday that she would leave on Thursday.
b. Strand-None: I don't know who she said to that she would leave on Thursday.
c. PPipe-Extra: I don't know to whom she said on Tuesday that she would leave on Thursday.
d. PPipe-None: I don't know to whom she said that she would leave on Thursday.
- (59) a. Strand-Extra: I was standing next to the man who she said to at the party that she was moving to Zimbabwe.
b. Strand-None: I was standing next to the man who she said to that she was moving to Zimbabwe.
c. PPipe-Extra: I was standing next to the man to whom she said at the party that she was moving to Zimbabwe.
d. PPipe-None: I was standing next to the man to whom she said that she was moving to Zimbabwe.
- (60) a. Strand-Extra: That's the person that you need to make clear to before you can leave that you truly feel remorse about your actions.
b. Strand-None: That's the person that you need to make clear to that you truly feel remorse about your actions.
c. PPipe-Extra: That's the person to whom you need to make clear before you can leave that you truly feel remorse about your actions.
d. PPipe-None: That's the person to whom you need to make clear that you truly feel remorse about your actions.
- (61) a. Strand-Extra: That's the guy that she shouted to across a crowded room that she was in love with him.
b. Strand-None: That's the guy that she shouted to that she was in love with him.
c. PPipe-Extra: That's the guy to whom she shouted across a crowded room that she was in love with him.
d. Strand-None: That's the guy to whom she shouted that she was in love with him.
- (62) a. Strand-Extra: Tell me who she hinted to in a very subtle way that she wanted to dance.
b. Strand-None: Tell me who she hinted to that she wanted to dance.
c. PPipe-Extra: Tell me to whom she hinted in a very subtle way that she wanted to dance.
d. PPipe-None: Tell me to whom she hinted that she wanted to dance.
- (63) a. Strand-Extra: He never found out which official he needs to disclose to in writing that he is married.
b. Strand-None: He never found out which official he needs to disclose to that he is married.
c. PPipe-Extra: He never found out to which official he needs to disclose in writing that he is married.
d. PPipe-None: He never found out to which official he needs to disclose that he is married.
- (64) a. Strand-Extra: That's the reporter who she pointed out to at the press conference that the bill did not have enough support to pass.
b. Strand-None: That's the reporter who she pointed out to that the bill did not have enough support to pass.
c. PPipe-Extra: That's the reporter to whom she pointed out at the press conference that the bill did not have enough support to pass.
d. PPipe-None: That's the reporter to whom she pointed out that the bill did not have enough support to pass.

- (65) a. Strand-Extra: The document doesn't say which prophet God revealed to in a dream that the city would be destroyed.
 b. Strand-None: The document doesn't say which prophet God revealed to that the city would be destroyed.
 c. PPipe-Extra: The document doesn't say to which prophet God revealed in a dream that the city would be destroyed.
 d. PPipe-None: The document doesn't say to which prophet God revealed that the city would be destroyed.
- (66) a. Strand-Extra: The police never found out who the suspect suggested to at a religious gathering that he join a radical organization.
 b. Strand-None: The police never found out who the suspect suggested to that he join a radical organization.
 c. PPipe-Extra: The police never found out to whom the suspect suggested at a religious gathering that he join a radical organization.
 d. PPipe-None: The police never found out to whom the suspect suggested that he join a radical organization.
- (67) a. Strand-Extra: The campaign managers are discussing which special interest group they will announce to at a fundraiser that their candidate is running for president.
 b. Strand-None: The campaign managers are discussing which special interest group they will announce to that their candidate is running for president.
 c. PPipe-Extra: The campaign managers are discussing to which special interest group they will announce at a fundraiser that their candidate is running for president.
 d. PPipe-None: The campaign managers are discussing to which special interest group they will announce that their candidate is running for president.
- (68) a. Strand-Extra: Prosecutors want to talk to the psychiatrist who the defendant supposedly confessed to at a session that he had committed the murder.
 b. Strand-None: Prosecutors want to talk to the psychiatrist who the defendant supposedly confessed to that he had committed the murder.
 c. PPipe-Extra: Prosecutors want to talk to the psychiatrist to whom the defendant supposedly confessed at a session that he had committed the murder.
 d. PPipe-None: Prosecutors want to talk to the psychiatrist to whom the defendant supposedly confessed that he had committed the murder.
- (69) a. Strand-Extra: The book never reveals who she whispered to in the lobby of the corporate tower that she was actually an android.
 b. Strand-None: The book never reveals who she whispered to that she was actually an android.
 c. PPipe-Extra: The book never reveals to whom she whispered in the lobby of the corporate tower that she was actually an android.
 d. PPipe-None: The book never reveals to whom she whispered that she was actually an android.

References

- Abels, Klaus (2008), "Towards a Restrictive Theory of Remnant Movement." *Linguistic Variation Yearbook* 7: 53–120.
- Alrenga, Peter (2005), "A Sentential Subject Asymmetry in English and Its Implications for Complement Selection." *Syntax* 8: 175–207.
- Baayen, R. H. (2008), *Analyzing Linguistic Data: A Practical Introduction to Statistics Using R*. Cambridge: Cambridge University Press.

- Baltin, Mark R. (1982), “A Landing Site Theory of Movement Rules.” *Linguistic Inquiry* 13: 1–38.
- Barker, Chris (2012), “Quantificational Binding Does Not Require C-Command.” *Linguistic Inquiry* 43: 614–633.
- Bayer, Josef (1995), “On the Origin of Sentential Arguments in German and Bengali.” In Hubert Haider, Susan Olsen, and Sten Vikner, eds., *Studies in Comparative Germanic Syntax*, Dordrecht: Kluwer, pp. 47–76.
- Bresnan, Joan (1995), “Category Mismatches.” In Akinbiyi Akinlabi, ed., *Theoretical Approaches to African Linguistics*, Trenton, NJ: African World Press, pp. 19–46.
- Bruening, Benjamin (2014), “Precede-and-Command Revisited.” *Language* 90: 342–388.
- Bruening, Benjamin (2017), “Passive *Do So*.” *Natural Language and Linguistic Theory* to appear.
- Büring, Daniel, and Katharina Hartmann (1997), “Doing the Right Thing.” *The Linguistic Review* 14: 1–42.
- Chaves, Rui P. (2012), “On the Grammar of Extraction and Coordination.” *Natural Language and Linguistic Theory* 30: 465–512.
- Chomsky, Noam (2000), “Minimalist Inquiries: The Framework.” In Roger Martin, David Michaels, and Juan Uriagereka, eds., *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, Cambridge, MA: MIT Press, pp. 89–155.
- Chomsky, Noam (2008), “On Phases.” In Robert Freidin, Carlos P. Otero, and Maria Luisa Zubizarreta, eds., *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud*, Cambridge, MA: MIT Press, pp. 133–166.
- Corver, Norbert (2006), “Freezing Effects.” In Martin Everaert and Henk van Riemsdijk, eds., *The Blackwell Companion to Syntax*, Oxford: Blackwell, vol. 2, pp. 383–406.
- Culicover, Peter W., and Michael S. Rochemont (1990), “Extrapolation and the Complement Principle.” *Linguistic Inquiry* 21: 23–47.
- Davies, William D., and Stanley Dubinsky (2009), “On the Existence (and Distribution) of Sentential Subjects.” In Donna B. Gerdts, John C. Moore, and Maria Polinsky, eds., *Hypothesis A/Hypothesis B: Linguistic Explorations in Honor of David M. Perlmutter*, Cambridge, MA: MIT Press, pp. 111–128.
- Drummond, Alex (2009), “The Unity of Extrapolation and the A/A’ Distinction.” In Nikki Adams, Adam Cooper, Fey Parrill, and Thomas Wier, eds., *Papers from the 45th Regional Meeting of the Chicago Linguistic Society*, Chicago: University of Chicago, vol. 2, pp. 43–56.
- Fodor, Janet Dean (1978), “Parsing Strategies and Constraints on Transformations.” *Linguistic Inquiry* 9: 427–473.
- Fox, Danny, and David Pesetsky (2005), “Cyclic Linearization of Syntactic Structure.” *Theoretical Linguistics* 31: 1–45.
- Gibson, Edward, Steve Piantadosi, and Kristina Fedorenko (2011), “Using Mechanical Turk to Obtain and Analyze English Acceptability Judgments.” *Language and Linguistics Compass* 5: 509–524.
- Heycock, Caroline (1995), “Asymmetries in Reconstruction.” *Linguistic Inquiry* 26: 547–570.
- Higgins, Roger (1973), “On J. Emonds’s Analysis of Extrapolation.” In John P. Kimball, ed., *Syntax and Semantics Volume 2*, New York: Academic Press, pp. 149–195.
- Hinterhölzl, Roland (1999), *Restructuring Infinitives and the Theory of Complementation*. Ph.D. thesis, University of Southern California.
- Hinterhölzl, Roland (2006), *Scrambling, Remnant Movement, and Restructuring in West Germanic*. Oxford: Oxford University Press.
- Hofmeister, Philip, and Ivan A. Sag (2010), “Cognitive Constraints and Island Effects.” *Language* 86: 366–415.
- Hornstein, Norbert, and Amy Weinberg (1981), “Case Theory and Preposition Stranding.” *Linguistic Inquiry* 12: 55–91.
- Janke, Vikki, and Ad Neeleman (2012), “Ascending and Descending VPs in English.” *Linguistic Inquiry* 43: 151–190.
- Johnson, Kyle (1991), “Object Positions.” *Natural Language and Linguistic Theory* 9: 577–636.
- Kaplan, Ronald, and Joan Bresnan (1982), “Lexical-Functional Grammar: A Formal System for Grammatical Representation.” In Joan Bresnan, ed., *The Mental Representation of Grammatical Relations*, Cambridge, MA: MIT Press, pp. 173–281.
- Kayne, Richard (1994), *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.
- Kayne, Richard (2005), “Antisymmetry and Japanese.” In *Movement and Silence*, Oxford: Oxford University Press, pp. 215–240.
- Kertz, Laura (2013), “Verb Phrase Ellipsis: The View from Information Structure.” *Language* 89: 390–428.

- Kluender, Robert (1992), "Deriving Island Constraints from Principles of Predication." In Helen Goodluck and Michael Rochemont, eds., *Island Constraints: Theory, Acquisition and Processing*, Dordrecht: Kluwer, pp. 223–258.
- Kluender, Robert, and Marta Kutas (1993), "Subjacency as a Processing Phenomenon." *Language and Cognitive Processes* 8: 573–633.
- Koster, Jan (1978), "Conditions, Empty Nodes, and Markedness." *Linguistic Inquiry* 9: 551–593.
- Kratzer, Angelika (1996), "Severing the External Argument from Its Verb." In John Rooryck and Laurie Zaring, eds., *Phrase Structure and the Lexicon*, Dordrecht: Kluwer, pp. 109–137.
- Kuno, Susumo (1973), "Constraints on Internal Clauses and Sentential Subjects." *Linguistic Inquiry* 4: 363–385.
- Landau, Idan (2007), "EPP Extensions." *Linguistic Inquiry* 38: 485–523.
- Lechner, Winfried (2003), "Phrase Structure Paradoxes, Movement, and Ellipsis." In K. Schwabe and S. Winkler, eds., *The Interfaces: Deriving and Interpreting Omitted Structures*, Amsterdam: John Benjamins, pp. 187–203.
- Mahowald, Kyle, Peter Graff, Jeremy Hartman, and Edward Gibson (2016), "SNAP Judgments: A Small N Acceptability Paradigm (SNAP) for Linguistic Acceptability Judgments." *Language* 92: 619–635.
- Marantz, Alec (1993), "Implications of Asymmetries in Double Object Constructions." In Sam A. Mchombo, ed., *Theoretical Aspects of Bantu Grammar*, Stanford: CSLI Publications, pp. 113–150.
- Merchant, Jason (2001), *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*. Oxford: Oxford University Press.
- Miller, Philip (2011), "The Choice between Verbal Anaphors in Discourse." In Iris Hendrickx, Sobha Lalitha Devi, António Branco, and Ruslan Mitkov, eds., *Anaphora Processing and Applications: 8th Discourse Anaphora and Anaphor Resolution Colloquium, DAARC 2011*, Berlin: Springer, pp. 82–95.
- Miller, Philip (2013), "Usage Preferences: The Case of the English Verbal Anaphor *do so*." In Stefan Müller, ed., *Proceedings of the 20th International Conference on Head-Driven Phrase Structure Grammar*, Stanford: CSLI Publications, pp. 121–139. On-line publication available at <http://csli-publications.stanford.edu/HPSG/2013>.
- Moulton, Keir (2013), "Not Moving Clauses: Connectivity in Clausal Arguments." *Syntax* 16: 250–291.
- Moulton, Keir (2015), "CPs: Copies and Compositionality." *Linguistic Inquiry* 46: 305–342.
- Müller, Gereon (1996), "A Constraint on Remnant Movement." *Natural Language and Linguistic Theory* 14: 355–407.
- Pesetsky, David (1995), *Zero Syntax: Experiencers and Cascades*. Cambridge, MA: MIT Press.
- Phillips, Colin (2003), "Linear Order and Constituency." *Linguistic Inquiry* 34: 37–90.
- Pollard, Carl, and Ivan Sag (1992), "Anaphors in English and the Scope of the Binding Theory." *Linguistic Inquiry* 23: 261–303.
- Postal, Paul M. (1972), "On Some Rules That Are Not Successive Cyclic." *Linguistic Inquiry* 3: 211–222.
- Postal, Paul M. (1994), "Parasitic and Pseudoparasitic Gaps." *Linguistic Inquiry* 25: 63–117.
- R Core Team (2012), *R: A Language and Environment for Statistical Computing*. Vienna: R Foundation for Statistical Computing.
- Reinhart, Tanya (1980), "On the Position of Extraposed Clauses." *Linguistic Inquiry* 11: 621–624.
- Reinhart, Tanya (1981), "Definite NP Anaphora and C-Command Domains." *Linguistic Inquiry* 12: 605–635.
- Rosenbaum, Peter (1967), *The Grammar of English Predicate Complement Constructions*. Cambridge, MA: MIT Press.
- Ross, John Robert (1967), *Constraints on Variables in Syntax*. Ph.D. thesis, Massachusetts Institute of Technology.
- Stowell, Tim (1981), *Origins of Phrase Structure*. Ph.D. thesis, Massachusetts Institute of Technology.
- Takahashi, Shoichi (2010), "The Hidden Side of Clausal Complements." *Natural Language and Linguistic Theory* 28: 343–380.
- Wexler, Kenneth, and Peter W. Culicover (1980), *Formal Principles of Language Acquisition*. Cambridge, MA: MIT Press.
- Zwart, Jan-Wouter (1993), *Dutch Syntax: A Minimalist Approach*. Ph.D. thesis, University of Groningen.