

Swiping without Sluicing

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1 Introduction

Ross (1969) noted that in English, the order of a preposition and a *wh*-word may be inverted when the clause following the *wh*-word is elided under sluicing, as shown in (1).

- (1) a. I know Mary gave a speech, but I can't remember **who to**.
b. You're going on a ten day hike? **Who with?**

Merchant (2002) termed this process *swiping*,¹ and in almost all previous literature on the subject, it has been claimed that swiping is impossible in the absence of sluicing.² The examples of swiping without sluicing in (2) are clearly ungrammatical.

- (2) a. * I know Mary was working, but I can't remember **who with** she was working.
b. * **Where to** are you moving?

Merchant calls this restriction the *Sluicing Condition*, given in (3).

- (3) **The Sluicing Condition**
Swiping only occurs in sluicing.

In this paper, I present novel data showing that swiping is not uniformly banned in the absence of sluicing. Swiping without sluicing is in fact possible when the inverted PP is coordinated with another *wh*-expression. The following example is from the internet:

- (4) Speed is defined to be distance divided by time; **when and who by** was this definition first put forward?

Previous accounts of swiping have asked what it is about sluicing that permits swiping. But consider the new typology in (5).

(5) Simple <i>wh</i> -questions:	✓ non-swiping *swiping
Sluiced <i>wh</i> -questions:	✓ non-swiping ✓ swiping
Coordinated <i>wh</i> -questions:	✓ non-swiping ✓ swiping

If swiping is available not only in sluices but in coordinated *wh*-questions too, the more relevant question becomes: what is it about 'simple' (i.e., non-sluiced, non-coordinated) *wh*-questions that causes swiping to be banned? In this paper I present a novel analysis of swiping, in which swiping is an instance of a non-feature-driven movement operation. Swiped derivations are freely generated by the syntax and enter into competition with other derivations at a postsyntactic evaluation stage. In non-sluiced, non-coordinated *wh*-questions, the swiped derivation is always ruled out by a high-ranked prosodic constraint (the *Condition on wh-prosody*), but this constraint does *not* rule out the swiped derivation in other contexts.

However, in order to ensure that this constraint permits swiping in coordinated *wh*-questions, it is necessary to make a particular stipulation about their prosody. Specifically, I argue that the prosody of *wh*-questions is like that of Right Node Raising constructions.

*I would like to thank Matt Barros and audiences at Yale and PLC40 for their advice and feedback on this project.

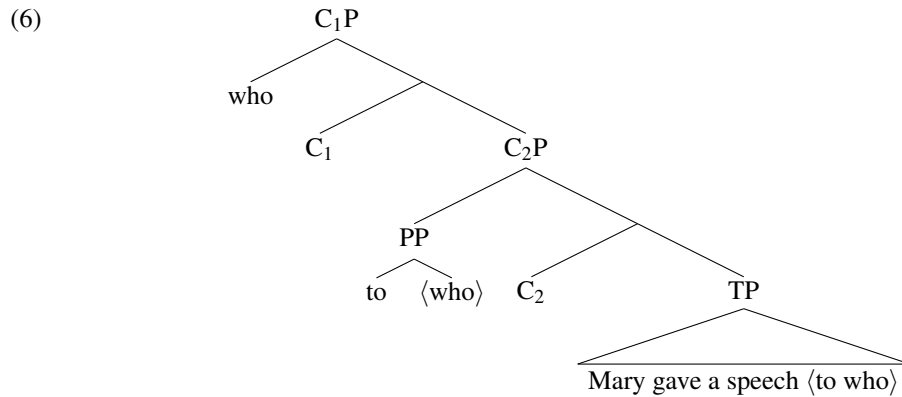
¹The term *Swiping* is an acronym for *Sluiced Wh-word Inversion with Prepositions (in Northern Germanic)*.

²Though see Kayne 2014 for some variability in the judgments.

The paper is organized as follows. Section 2 introduces previous approaches to swiping, and highlights some problems with those analyses in the light of new and old data. Section 3 lays out a new prosodically-oriented account of swiping. Section 4 considers in more depth the particular prosodic signature of coordinated *wh*-questions that makes swiping possible, and Section 5 concludes.

2 The Syntax of Swiping

I assume that swiped clauses have a structure similar to that proposed by van Craenenbroeck (2004, 2010), also adopted in revised forms by Hartman and Ai (2009) and Radford and Iwasaki (2015).³ In outline, the analysis is that after the PP containing the *wh*-phrase has raised to the clause edge, the *wh*-phrase raises by itself to a higher position in the left periphery of the clause. A derivation of the elided clause in (1a) is schematized in (6), where the landing site of the PP is Spec-CP₂, and the landing site of the *wh*-phrase is Spec-CP₁.



This analysis captures a crucial property of swiping: that the *wh*-phrase and the preposition do not form a constituent (*contra* Merchant 2002). One piece of empirical evidence for this is the phenomenon of *long-distance* swiping, as in (7) from Hartman and Ai 2009, where the *wh*-word is separated from the preposition by an intervening clause.

- (7) a. Besides, Jisao was “invited” here. **Who** do you think **by**?
 b. It looks like he’s thinking pretty hard in the last two poses, **what** do you suppose **about**?

Another piece of evidence showing that the *wh*-word and the preposition do not form a constituent is the fact that an adverb modifying the elided clause can appear between them, as in (8), from Larson 2012.

³Radford and Iwasaki (2015) diverge from van Craenenbroeck (2004, 2010) and Hartman and Ai (2009) by assuming that the preposition itself undergoes further movement, in the form of head movement to a Focus head. This is supposed to account for the (claimed) generalization that only ‘simplex’ prepositions may be swiped:

- (i) I know they fell out, but I don’t know **what over**/***what because of**.

There is, however, an empirical problem with using head-movement over phrasal movement: I was able to find several online examples of complex (multiple-word) prepositions being swiped, shown in (ii).

- (ii) a. I think I was high last night, but idk [I don’t know] **what off of**.
 b. If you made it, how did you make it and **what out of**?
 c. Furthermore there is a place for everyone’s opinion no matter **who or what on behalf of**.
 d. **What in aid of**, you ask?

The conditions under which complex prepositions may take part in swiping is a topic that requires more research.

- (8) a. I know who Ivan was SOFTLY talking to, I just don't remember **who LOUDLY to**.
 b. I know who Ivan was OSTENSIBLY talking to, I just don't remember **who ACTUALLY to**.

The structure in (6), however, does not by itself shed any light on why swiping is constrained by the Sluicing Condition in (3). In the remainder of this section, I consider two previous types of explanation for this restriction, outlining some of their advantages and issues.

2.1 The Sluicing-as-Repair Account

One type of explanation for the Sluicing Condition holds that swiping involves the creation of a chain that leaves illegal traces. Eliding the structure below CP has the effect of eliminating the illegal traces, thereby 'repairing' the structure (see Merchant 2001 for more on this approach). The general approach is well-motivated. To illustrate, it was first pointed out by Ross (1969) that sluicing ameliorates island violations inside the ellipsis site:

- (9) a. * She kissed a man who bit one of my friends, but Tom doesn't realize [which one of my friends]_i she kissed a man who bit t_i .
 b. She kissed a man who bit one of my friends, but Tom doesn't realize [which one of my friends]_i ~~she kissed a man who bit~~ t_i .

The trace of movement in (9a) violates a relative clause island. Merchant argues that deleting the illegal trace at PF, as in (9b), rescues the structure. However, while the general approach is well-motivated, the sources of illicitness that are supposed to render the chains inviolable in swiping are not particularly coherent. van Craenenbroeck (2010) relies on the *Chain Uniformity Condition*, which requires that all links in a chain have the same category (Chomsky, 1995). In van Craenenbroeck's analysis, the chain in (10) is illicit, as the three links are not of the same category (one is a PP, the other two are DPs). By eliding the TP, however, the TP-internal trace *about what* becomes 'invisible' to PF. The only remaining movement chain is therefore the *uniform* chain consisting of the DP *what* and its trace inside the raised PP *about what*. In this way, sluicing causes Chain Uniformity to be satisfied.

- (10) * What about were you crying?
 [CP [DP what] ... [PP about what] [TP ... [~~PP about what~~]]]

Hartman and Ai (2009) provide several clear arguments against van Craenenbroeck's interpretation of Chain Uniformity. Most clearly, there is the fact that the 'chain' in (10) is better analyzed as involving successive-cyclic creation of two separate chains – one of the PP to the inner shell of the CP, the other of the DP to the outer shell of the CP. Furthermore, Chain Uniformity holds at LF too (Chomsky, 1995), and so even the elided form of (10) would still induce a Chain Uniformity Condition violation at LF.

Radford and Iwasaki (2015) make use of alternative constraints to derive the Sluicing Condition. One is the Edge Condition of Chomsky 2008, which "bars subextraction out of a constituent on the edge of a phase." For them, the PP's first landing site (Spec-FinP rather than Spec-FocP) is a phase edge. Since swiping involves removing a DP from inside the PP on the phase edge, it falls afoul of the Edge Condition. The other condition is the Freezing Condition (Wexler and Culicover, 1980), which bars subextraction out of moved constituents. While an appraisal of the Edge Condition and the Freezing Condition is well beyond the scope of this paper, it is worth pointing out that that researchers have found these conditions to be problematic. The sentences in (11), from Haegeman et al. 2014, provide an empirical challenge to both constraints, as they feature subextraction from a phase-edge-dwelling constituent that has moved there from a lower position.

- (11) a. The 'Satanic Verses' (of which_i I am not sure [precisely how many copies t_i]_j the publishers sold t_j) caused uproar throughout much of the world when it first appeared.
 b. It's an ancient civilisation of which_i it would seem that [hardly any traces t_i]_j have archaeologists been able to uncover t_j so far.

In addition to these problems, it is unclear how the ellipsis-as-repair approach to swiping could account for grammatical sentences like those in (4) and (12), all found on the internet, which feature swiping in the second conjunct of a unelided coordinated *wh*-question.

- (12) a. So jumping forward slightly, **where and who with** did you study?
 b. I'm in Alverthorpe — [n]ot far really — **when and how long for** were you needing a holiday home?
 c. However, if you need to do this on your own, Planned Parenthood will at least let you know **when and what for** they need parental consent before they flat out call them for you.

2.2 Hartman and Ai's Focus Account

Hartman and Ai (2009) take an alternative approach to motivating the Sluicing Condition: rather than having ill-formed movement operations be 'rescued' by ellipsis, they argue that swiping is motivated by the ellipsis operation itself. They assume that the preposition in a swiping structure bears a [Focus] feature (marked with a subscript 'F'). They also assume that elements with a [Focus] feature may move to Spec-FocP *only* if compelled to do so by some independent motivation. Thus the movement of the PP to Spec-FocP in (13a) is not justified, as it is motivated by no independent reason. On the other hand the same movement in (13b) *is* justified, as it is motivated by a requirement that [Focus]-bearing elements cannot be elided.

- (13) a. *What_{[FocP [PP about_F what]_i [CP were you crying [PP about_F what]_i]]}
- b. What_{[FocP [PP about_F what]_i [~~CP were you crying~~ [~~PP about_F what~~]_i]]}

This claim that [Focus]-marked constituents cannot be elided is problematic, however. Consider first (14). In the first clause, the words *four* and *two* are marked with contrastive focus, and the phonological reflex of this is the prosodic prominence they receive. In the second clause, *four* and *two* still receive a degree of prosodic prominence, (although it is less than in the first clause because the entire clause is deaccented, Selkirk 2008). This means that they can still be assumed to be focus-marked.

- (14) Someone gave little Mary FOUR_F cookies rather than TWO_F,
 but we don't know who *gave little Mary FOUR_F cookies rather than TWO_F.*

Now consider (15). Given that in its unelided counterpart in (14), *four* and *two* are happily focus-marked, we can assume that inside the elided part of (15) the constituents *four* and *two* are also still focus-marked. And if this is the case, then it follows that focus-marked constituents can be elided.

- (15) Someone gave little Mary FOUR_F cookies rather than TWO_F,
 but we don't know who ~~gave little Mary FOUR_F cookies rather than TWO_F~~

Another problem is that like the ellipsis-as-repair approaches to swiping, Hartman and Ai's proposal cannot account for the unexpected availability of swiping in coordinated *wh*-questions like those in (12).

While I do not assume the substance of Hartman and Ai's proposal to be correct, I do make use of a crucial component of the analysis: that movement may be motivated by non-syntactic factors, rather than only by syntax-internal factors such as feature checking or valuation. For Hartman and Ai, the movement operation of swiping is motivated by a ban on [Focus]-marked constituents in ellipsis sites. In the analysis presented here, it is motivated by a prosodic interface constraint.

In the next section, I provide a detailed explanation of how this particular independently-motivated prosodic interface constraint accounts for the distribution of swiping in English.

wh-prosody. English behaves this way. In (19a), we see that according to the default prosody of English, the complementizer and the in-situ *wh*-word are not enclosed by a single ϕ . *Wh*-movement, as shown in (19b), reduces the number of ϕ_{max} boundaries between the *wh*-word and complementizer from two to one, and so is the preferred derivation.

(19) **English**a. * ***wh*-in-situ**

[_{CP} C ... *wh*]
 (ϕ C ...) (ϕ ...) (ϕ *wh*) CWhP violations: 2

b. \mathbb{E} ***wh*-movement**

[_{CP} *wh* C ... ~~*wh*~~]
 (ϕ ***wh***) (ϕ C ...) (ϕ ...) (~~ϕ *wh*~~) CWhP violations: 1

In the next subsection, we see how swiped and unswiped derivations fare when evaluated against the CWhP in three different environments: simple, sluiced and coordinated *wh*-questions.

3.2 Simple *Wh*-questions

In a simple (i.e., unsluiced, uncoordinated) *wh*-question, the CWhP will always favor the unswiped derivation over the swiped derivation. Consider the two options in (20). The top row of each example shows its syntactic phrasing, and the bottom row shows its prosodic phrasing.

(20) a. \mathbb{E} **Unswiped**

[_{PP} **with** [_{DP} **who(m)**]] are you working?
 (ϕ *wh*) C CWhP violations: 1

b. * **Swiped**

[_{DP} **who**] [_{PP} **with** *who*] are you working?
 (ϕ *wh*) (ϕ) C CWhP violations: 2

In (20a), the preposition *with* procliticizes onto the *wh*-word, and the PP *with who(m)* forms a single ϕ to the exclusion of the complementizer (being a matrix question, the auxiliary *are* occupies the relevant complementizer position). Therefore a single ϕ_{max} boundary intervenes between the *wh*-word and the auxiliary, and so the derivation gets one CWhP violation mark. In (20b), however, the preposition cannot *encliticize* onto the *wh*-word, and so they form separate ϕ s. As a result, *two* ϕ_{max} boundaries intervene between the *wh*-word and the complementizer, and the CWhP therefore rules out the swiped derivation in favor of the unswiped one.⁶

3.3 Sluiced *Wh*-questions

In a sluiced *wh*-question, the swiped and unswiped derivations perform equally well when evaluated against the CWhP, and so neither is ruled out. The decision of which to pronounce is left to lower-ranked constraints. Consider the two options in (21).

(21) a. \mathbb{E} **Unswiped**

[_{PP} **with** [_{DP} **who(m)**]] are-you-working?
 (ϕ *wh*) \in CWhP violations: 0

b. \mathbb{E} **Swiped**

[_{DP} **who**] [_{PP} **with** *who*] are-you-working?
 (ϕ *wh*) (ϕ) \in CWhP violations: 0

⁶I generally leave aside P-stranded derivations in this paper, but note that the P-stranded version of (20) fares just as well as the unswiped derivation, correctly predicting that it should be possible:

(iii) **P-stranded**

[_{DP} **who**] are you working with?
 (ϕ *wh*) C CWhP violations: 1

- (24) ~~☞~~ **Swiped** (with a new ϕ)
- | | | | | | | | | | |
|----------|--------------------|----------|----------|------------------|----------|------------------------|-----|----------------------------|--|
| [AdvP | when] | [&· | and [DP | who] | [PP | by <i>who</i>] |]] | was this first discovered? | |
| (ϕ | <i>wh</i>) | (ϕ | (ϕ | <i>wh</i>) | (ϕ |)) | C | | |
| | <i>wh</i>) | | | | | |) C | violations: 2 | |
| | | | | <i>wh</i> | | |) C | violations: 1 | |
| | | | | | | | | Total CWhP violations: 3 | |

The derivation with swiping in the right conjunct now performs just as well against the CWhP as the derivation without swiping (3 CWhP violations each). In the next section, I justify the addition of this extra ϕ .

4 The Prosody of *Wh*-coordination

In this section, I provide evidence to support the assertion that in coordinated *wh*-questions, each conjunct is enclosed within its own ϕ , to the exclusion of material that is shared between the conjuncts. Focusing on the right conjunct, I present two pieces of evidence for the existence of a ϕ that encloses the *unshared* contents of the right conjunct in (24), prosodically separating it from the contents of the remainder of the phrase.⁷

4.1 Evidence #1: Right Node Raising

Wh-coordination involves the coordination of non-constituents (Gračanin Yuksek, 2007). It is therefore striking that another well-documented type of non-constituent coordination, Right Node Raising (RNR), has a very similar prosodic signature to the one suggested here for *wh*-coordination.

Selkirk (2002) shows that in an RNR sentence, each coordinated non-constituent forms its own prosodic constituent, as in (25).⁸

- (25) John LOVED, but Mary HATED, that new Woody Allen film.
- | | | | |
|------------|--------------|--------------|-----|
| (<i>t</i> |) (<i>t</i> |) (<i>t</i> |)) |
|------------|--------------|--------------|-----|

Selkirk argues that the cause of this prosodic phrasing is the contrastive focus found on the final word of each coordinated non-constituent. The focussed constituent would then force a prosodic boundary after itself. However, this cannot be the case. Consider (26). In (26a), we see that the clitic pronoun *'im* is unable to cliticize onto the preceding word *stand*. This is unexpected if the prosodic boundary after *stand* is placed after the focus-bearing element: *'im* should be able to simply become part of *stand*'s prosodic word and precede the prosodic boundary. Instead, the way to make the sentence grammatical is to place the prosodic boundary immediately after *stand*, and force the pronoun to project its own prosodic word, as in (26b).

- (26) I'm pretty sure that's John and Mary's kid screaming over there...
- a. * John LOVES, but Mary can't STAND **'im**, when he gets upset.
 - b. John LOVES, but Mary can't STAND, **him** when he gets upset.

Therefore, there must be something other than the contrastive focus in each conjunct that forces the prosodic signature seen in RNR. I argue that this prosodic signature is a reflex of non-constituent coordination, and that is why we see it in RNR and *wh*-coordination (I leave it to future research to determine if the signature can be derived in a more explanatory way).

⁷I do not discuss evidence for the ϕ that encloses the left conjunct, but I assume it to exist on the grounds of parallelism.

⁸Selkirk in fact makes the more specific claim that each non-constituent forms its own intonation phrase (*t*). However, she does not consider cases of smaller RNR structures like (iv), which may be ϕ s rather than *t*s. I assume that non-constituent coordination may induce ϕ s or *t*s, though I do not consider here the circumstances under which each shows up.

- (iv) Go get two big and three small cookies.
- | | | | |
|------------|--------------|------------|-----|
| (ϕ ? |) (ϕ ? |) (ϕ |)) |
|------------|--------------|------------|-----|

4.2 Evidence #2: Aggressively Non-D-linked *Wh*-phrases

Aggressively non-D-linked *wh*-phrases (ANDLPs) are *wh*-phrases that are followed by a phrase like *the hell* or *on earth*, as in ‘Where the hell are you?’ or ‘What on earth is that?’. Sprouse (2006) notes that an ANDLP cannot follow a *wh*-word in a sluice, unless the structure is rescued by swiping:

- (27) a. * He was talking about something, but I don’t know **what the hell** to be honest.
 b. He was talking, but I don’t know **what the hell about** to be honest.

Using the *accent projection* framework of Gussenhoven 1984, Sprouse claims that structures like (27a) are banned according to the following reasoning. Firstly, *wh*-words necessarily occupy their own *focus domain*, and share it with no other elements. This means that *the hell*, in (27a), is forced into its own focus domain, as schematized in (28a). Secondly, focus domains must have an accent-bearing element, but *the hell* is unable to bear an accent. Thus we end up with a focus domain with no accent, and the structure is ungrammatical. In (27b), on the other hand, *the hell* is included in the focus domain headed by *about*, as shown in (28b). *About* can receive an accent and so the structure is grammatical.

- (28) a. * ... but I don’t know [FD *whát*] [FD *the hell*].
 b. ... but I don’t know [FD *whát*] [FD *the hell abóut*].

We can reconstrue Sprouse’s analysis in the following way: ANDLPs such as *the hell* resist prosodic prominence. In English, the right edges of ϕ s (which I treat to be essentially equivalent to Gussenhoven’s focus domains) are prosodically prominent. Consequently, structures in which an ANDLP ends up at the right edge of a ϕ are greatly dispreferred.

Now consider (29a). It is unexpectedly degraded in comparison with (29b).

- (29) a. ?? When and **where the hell** did Chomsky give that talk?
 b. **Where the hell** did Chomsky give that talk?

Under the analysis that ANDLPs resist prosodic prominence, however, we have our answer: (29a) is degraded because the ANDLP *the hell* falls at the right edge of a ϕ . Specifically, it falls at the right edge of the special ϕ inserted to enclose the non-shared contents of the right conjunct. This ϕ is absent in (29b), explaining the acceptability of the ANDLP.

Note that the oddness of (29a) cannot stem from the fact that one *wh*-phrase features an ANDLP while the other does not, as (30) is identical in this respect yet is more acceptable.⁹

- (30) ? I’m wondering when and who the hell to Chomsky gave that talk.

In summary, then, RNR sentences and coordinated *wh*-questions share a common prosodic signature. I argue that this is a result of their similar syntactic structures: both involve non-constituent coordination. The particular prosody associated with this structure involves each coordinated non-constituent being enclosed in its own ϕ . It is this ϕ which licenses swiping, as shown in Section 3, and bars ANDLPs from its right edge.

5 Conclusion

I have argued that swiping is a non-feature-driven movement operation licensed by a particular constraint that mediates the relation between prosody and syntax, Richards’s Condition on *wh*-prosody. Specifically, swiping is possible only when the swiped and unswiped derivations have equal numbers of violations of the CWhP, and this only happens in sluices and coordinated *wh*-questions. In simple *wh*-questions, the swiped derivation will always receive more violations than the unswiped derivation, and so will always lose out.

⁹This judgment may be controversial and in future work I intend to test it experimentally.

This explanation is contingent on an analysis of coordinated *wh*-questions which holds that they have a particular prosodic signature. I suggested that this prosodic signature could be characteristic of non-constituent coordination generally, arguing that we see it in Right Node Raising too.

In future work I intend to tackle the question of how information structure interacts with swiping, when swiping is not already ruled out. In previous work such as Hartman and Ai 2009 it has been proposed that the preposition in a swipe is ‘focused’, but this is used more as an explanation for its syntactic behavior than as a description of its information-structural role.

I offer no solution for now, but note that the approach presented here allows us to frame the question in the following way: when the CWhP fails to distinguish between competing derivations, which lower-ranked interface constraints decide the ultimate winner?

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