On Swiping in English

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Abstract This paper examines the syntax of clauses in which prepositions undergo *Swiping/Sluice-Stranding* in elliptical questions like *Who with?* (e.g. in response to 'She's having an affair'). We begin by outlining characteristic properties of Swiping, noting that this involves an interrogative wh-constituent positioned in front of a focused preposition, and that the clause remnant following the preposition obligatorily undergoes a type of ellipsis traditionally termed *Sluicing*. We outline the recent *CP shell* analysis of Swiping developed by van Craenenbroeck (2010), under which a PP containing a wh-word is moved into the specifier position of an inner CP, the wh-word is moved into the specifier position of an outer CP (stranding the preposition on the edge of the inner CP), and the residual TP is deleted at PF. We discuss a range of problems with his analysis, and argue that it can be substantially improved if we adopt a more richly articulated cartographic structure for the clause periphery under which Swiped clauses contain ForceP, FocP, and FinP projections. More specifically, we argue that the wh-PP moves to the edge of FinP (with the auxiliary moving to Fin^o in structures involving auxiliary inversion), the preposition moves into Foc^o to mark it as focused, and the wh-constituent moves into Spec-ForceP to type the clause as interrogative. We claim that the obligatory Sluicing component of Swiping involves ellipsis of FinP in the PF component, and that this is required in order to repair violations of PF constraints which would otherwise arise. We show how our analysis accounts for a range of phenomena not captured under van Craenenbroeck's original analysis.

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1 Introduction

Alongside the full wh-clause structure italicized in (1a) below, English also permits the elliptical wh-structure italicized in (1b), claimed by Ross (1969) to involve a form of clausal ellipsis termed *Sluicing*:

(1)   (a)   She told me she was having an affair, so I asked *with whom she was having an affair*.
        (b)   She told me she was having an affair, so I asked *with whom*.

Rosen (1976) noted that alongside Sluicing structures like (1a) we also find elliptical structures like (2) below in which the italicized structure comprises a preposition with an 'inverted' wh-object (i.e. an object which precedes rather than follows its governing preposition):

(2)   She told me she was having an affair, so I asked *who with*.

Culicover (1999) termed this phenomenon *Sluice-Stranding* and Merchant (2002) called it *Swiping* (= *Sluicing With Inverted Prepositions In Northern Germanic*). A wide range of analyses of Swiping has been proposed in the research literature, including by Rosen (1976), van Riemsdijk (1982), Radford (1993), Lobeck (1995), Chung et al. (1995), Kim (1997), Richards (1997, 2001), Culicover (1999), Merchant (1999, 2001, 2002), Culicover and Jackendoff (2005), Hasegawa (2006), Nakao et al. (2006), Beecher (2007), Hartman (2007), Hartman and Ai (2009), Nakao (2009), van Craenenbroeck (2010), and Larson (2013).
    Merchant (1999, 2001, 2002) argued that Swiping has the following characteristics.

Only wh-words (*not wh-phrases*) *permit Swiping*.

(3)   They were complaining, but I can't remember *what* (*course) *about*.

There are restrictions on prepositions that can be Swiped.

(4)   I know they were complaining, but I'm not sure what *about*/*during.

Swiping is only permitted with an antecedentless preposition.

(5)   She was complaining (***about something**), but I don't remember *what about*.

Stress falls on the preposition, not the wh-word.

(6)   (a)   She fixed it, but God only knows what WITH.
        (b)   *She fixed it, but God only knows WHAT with.

Swiping requires Sluicing.

(7)   I know they were arguing, but I've no idea *what about* (**they were arguing*).

The five properties of Swiping identified by Merchant were taken as 'given' in much subsequent research, and a number of different attempts were made at accounting for them. For example, Culicover and Jackendoff (2005) handled the restrictions on the

choice of preposition by positing that Swiping is an idiosyncratic construction. The constraint that only wh-words (not wh-phrases) undergo Swiping was accounted for by positing that the wh-word adjoins to the preposition (Merchant 2002), or that the wh-word undergoes Long Head Movement (Nakao 2009). We will not review earlier work here, since it has been extensively reviewed elsewhere (Hartman 2007; van Craenenbroeck 2010; Larson 2013). Instead, in the next section, we turn to look at an alternative account of Swiping by van Craenenbroeck (2010) which aims to arrive at a principled account of the properties of Swiping. We present an outline of van Craenenbroeck's analysis in Sect. 2, before presenting a critique in Sect. 3. In Sect. 4, we argue that his analysis can be extended and improved if we modify some of his assumptions and adopt the more richly articulated structure for the clause periphery posited in the cartographic approach pioneered by Rizzi (1997). In Sect. 5 we consider possible drawbacks of our cartographic analysis of Swiping, before presenting overall conclusions in Sect. 6.

2 Outline of van Craenenbroeck's *CP shell* analysis

Van Craenenbroeck (2004, 2010) proposes a *CP shell* analysis of Swiping, under which CP is split into two different CP projections, an outer CP shell which he labels CP_1 and an inner CP core which he labels CP_2.[1] He maintains that the inner CP layer is 'the position targeted by focus movement' (van Craenenbroeck 2004:75), and that the outer CP layer is 'the projection related to clause typing' (van Craenenbroeck 2004:32). The way his analysis works can be illustrated by considering the derivation he outlines (van Craenenbroeck 2004:72) for SPEAKER B's utterance in:

(8) SPEAKER A: Ed wrote a book.
     SPEAKER B: What about?

The wh-interrogative operator *what* originates internally within TP as the object of a PP headed by the preposition *about*, as in (9a) below. The resulting TP is merged with a null C which attracts the wh-PP *about what* to move to the edge of the lower CP (= CP_2), so forming (9b). CP_2 is then merged with a null C^o which attracts *what* to move to become its specifier, giving rise to (9c). Finally, TP undergoes Sluicing at PF, deriving the structure (9d), where *e* denotes the elided TP.[2]

(9) (a) $[_{TP}$ Ed wrote a book $[_{PP}$ $[_P$ about] what]]
     (b) $[_{CP2}$ $[_{PP}$ $[_P$ *about*] *what*] $[_{C2}$ ø] $[_{TP}$ Ed $[_T$ ø] wrote a book t_{PP}]]
     (c) $[_{CP1}$ *what* $[_{C1}$ ø] $[_{CP2}$ $[_{PP}$ $[_P$ about] t_{WH}] $[_{C2}$ ø] $[_{TP}$ Ed wrote a book t_{PP}]]]
     (d) $[_{CP1}$ what $[_{C1}$ ø] $[_{CP2}$ $[_{PP}$ $[_P$ about] t_{WH}] $[_{C2}$ ø] *e*]]

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[1] Related multiple-projection analyses are found in Richards (1997, 2001) and Hartman (2007). Richards' work is critically reviewed by Merchant (2002:300–301) and van Craenenbroeck (2010:87–90), and Hartman's by van Craenenbroeck (2010:96–101), so we will not consider their analyses here.

[2] Throughout, we simplify representations in various ways, including by showing only those minimal and maximal projections relevant to the discussion at hand, by showing trace copies of moved constituents as *t*, and by not showing wh-movement transiting through Spec-vP.

A key assumption embodied in van Craenenbroeck's analysis is that *what* and *about* end up positioned on the edge of two different CP projections.

Van Craenenbroeck argues that his analysis accounts for why Swiped prepositions always bear stress, and why a preposition can only be Swiped when not *given* (i.e. when there is no occurrence of the preposition in the antecedent of the elided clause). He claims (van Craenenbroeck 2004:75) that both properties are a consequence of the Swiped preposition being focused (from which it follows both that it is stressed and that it represents new information). He further maintains that 'the focus interpretation of Swiped prepositions follows from the structural position in which they are stranded'. This is because they are stranded on the edge of CP_2 and CP_2 is the locus of focused constituents.

A further property of Swiping which van Craenenbroeck claims that his analysis can account for is that Swiping is only permitted in clauses which undergo Sluicing. He maintains that this is because Swiping without Sluicing would lead to violation of the Chain Uniformity Condition/CUC (Chomsky 1995:253 (17)), which requires that all links/copies in a movement chain should have a uniform status. For example, if no Sluicing took place in (9), the superficial structure would be (9c). However, (9c) would violate CUC because the wh-chain would comprise three links: (i) the wh-QP *what* on the edge of CP_1; a copy of the wh-QP *what* inside a PP on the edge of CP_2; and a copy of the wh-PP *about what* inside TP. The resulting wh-chain would be categorically non-uniform, since its two higher links have the status of QP, but the lowest link has the status of PP. However, since Sluicing deletes the TP containing the lowest (PP) link of the chain, it leaves behind a structure (9d) which contains a uniform wh-QP chain comprising a QP *what* on the edge of CP_1 and a copy of the QP *what* on the edge of CP_2.

A fourth property of Swiping which van Craenenbroeck claims that his analysis can account for is that (according to him) it targets only wh-words, and not wh-phrases. He argues that this is because only a wh-word (not a wh-phrase) can function as an operator binding a variable. By contrast, wh-phrases are not operator expressions (he argues), and are generated in situ in the specifier position of the outer peripheral projection (CP_1), binding a null operator which moves to the specifier position in the inner peripheral projection (CP_2). On the assumption that UG bars a null operator from serving as the object of a pied-piped preposition (in accordance with the claim made by Chomsky 2001 that pied-piping requires phonological content), it follows that there will be no Swiping with wh-phrases.

3 Problems with the *CP shell* analysis

Having outlined van Craenenbroeck's CP shell analysis in the previous section, in this section we cast a more critical eye over it, and identify a number of theoretical and empirical problems facing it.

3.1 Chain uniformity

Van Craenenbroeck claims that Sluicing in cases of Swiping serves to repair violations of the Chain Uniformity Condition/CUC in derivations like (9). Hartman and

Ai (2009) give two reasons for doubting this claim. One is that Chomsky (1995:91) posits that Chain Uniformity holds at LF, and van Craenenbroeck (2004:74) himself posits that it "applies not only at LF but also at PF". But if this is so, while TP deletion at PF would ensure that the PF representation (9d) does not violate CUC, it would not prevent the LF representation associated with (9c) from violating CUC. The second problem they note is that the CUC repair claim is based on the assumption that wh-movement in derivations such as (9) gives rise to a single movement chain. However, Hartman and Ai argue that the single chain assumption is implausible because Swiping does not involve successive-cyclic movement of a single constituent, but rather movement of two different constituents giving rise to the formation of two different wh-chains, one involving movement of the wh-PP *about what*, and the other involving movement of the QP *what* on its own. Since neither of these two wh-chains violates Chain Uniformity, Sluicing cannot be claimed to repair Chain Uniformity violations, they argue.

Moreover, van Craenenbroeck's analysis would appear to induce constraint violations which are not repaired by Sluicing. For example, extracting a wh-constituent out of a PP on the edge of an inner CP which is the complement of an outer CP violates the Constraint on Extraction Domains of Huang (1982:505), which specifies that "A phrase may be extracted out of a domain B only if B is properly governed" (e.g. if B is the complement of a lexical head); this is because the inner CP_2 is the complement of the C^o of the outer CP_1, and C^o is not a proper governor/lexical head.[3] Moreover, since CPs are phases, extracting *what* out of a PP on the edge of CP_2 will violate the Edge Condition of Chomsky (2008), barring subextraction out of a constituent on the edge of a phase. In addition, since Spec-CP_2 is taken by van Craenenbroeck to be the criterial position for a focused constituent, movement of the PP *about what* into Spec-CP_2 will mean that it occupies the criterial position for a focused constituent, and the Criterial Freezing Condition of Rizzi and Shlonsky (2007) and Rizzi (2010) will then prevent the object from being extracted out of this PP, in the same way as it prevents *which guy* from being extracted out of the bracketed PP headed by *with* in (10a), and likewise prevents *of whom* being extracted out of the bracketed nominal in (10b):[4]

(10) (a) *_Which guy_ do they think that [**with __**] it would be interesting to exchange ideas. (Rizzi and Shlonsky 2007:118)

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[3]For discussion of CED and how it might be formulated in Minimalist terms, see Nunes and Uriagereka (2000), Sabel (2002), Rackowski and Richards (2005), Stepanov (2007), Chomsky (2008), Müller (2010), Jurka et al. (2011), Sheehan (2010, 2013).

[4]The editor observes that the robustness of the Criterial Freezing Condition is potentially undermined by examples provided by Lasnik and Saito (1992) of "subextraction out of constituents in what would now be called Criterial Freezing positions which yield relatively acceptable results," including;

(i) ??_Who_ do you wonder [which picture of] is on sale? (Lasnik and Saito 1992:102)

However, Lasnik and Saito treat such sentences as doubly degraded (??), so it is clear that some constraint is being violated here, and Criterial Freezing is a likely candidate. Violation of a single constraint on its own sometimes leads to degradation rather than downright ungrammaticality: for discussion, see Haegeman et al. (2014).

(b)   *Of whom* do you think that [**compromising photos __**] the papers shouldn't have published?

Likewise, the Freezing Constraint (Wexler and Culicover 1980; Uriagereka 1999; Müller 2010), barring subextraction out of a moved constituent, would also bar *what* from being extracted out of the fronted PP *about what* in (9).[5]

3.2 Wh-phrase Swiping

A further problem arises from van Craenenbroeck's claim that only wh-words (not wh-phrases) can undergo Swiping. The empirical basis of this claim is called into question by attested cases of wh-phrase Swiping like those below ((11a–g) being examples which Hartman 2007:42–43 reports finding on the internet along with hundreds of similar examples, and (11h) being recorded by us from a live, unscripted sports commentary):

(11)   (a)   Chrissy, nice to meet you, I recognize your name, not sure *what site* **from**, but that doesn't matter, nice to meet you regardless.

        (b)   I'm definitely buying Megaman, but am not sure *what system* **for** yet.

        (c)   And yeah, it's open late. Not sure *what time* **til**, but late.

        (d)   And I won more tickets, but I don't know *what day* **for**, so I might be going twice.

        (e)   But 1st how do you tell who it was composed by and *what instrument* **for**, and what title best suits the piece etc.

        (f)   Will you be going into town to buy it on release day? If so, *which store* **from**?

        (g)   A complete breakdown of how Brown has scored his points and *which teams* **against** is as follows.

        (h)   England will beat India, but *how many wickets* **by**, that's a different question. (Geoff Boycott, BBC Radio 5 Sports Extra)

Such examples provide evidence that Swiping can indeed occur in structures where the object of the preposition is a *wh-phrase* rather than a wh-word.

Hartman and Ai (2009) argue that there are semantic/pragmatic constraints on the type of wh-constituent which can appear in Swiping structures, as we can illustrate in relation to:

(12)   (a)   He made a formal complaint, but I can't remember *what about*.

        (b)   *He made a formal complaint, but I can't remember *which about*.

        (c)   *He made a formal complaint, but I can't remember *what course about*.

They note that wh-constituents like *what course* and *which* are D-linked and require an antecedent—a condition not met in (12b, c). Since prepositions are focused in

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[5]Although (as pointed out by the editor) there is some overlap between the Criterial Freezing and Freezing constraints, the overlap is only partial in that (for instance) Criterial Freezing blocks extraction from an *in situ* constituent in a criterial position, and Freezing blocks extraction from a moved constituent in a non-criterial position. Hence we treat then as potentially distinct constraints throughout.

Swiping structures, this means that the preposition cannot have an antecedent. These two conflicting requirements mean that Swiping with wh-phrases generally leads to a crash.

However, the antecedent does not have to be explicit, since Swiping is permitted where there is an implicit antecedent (implied or entailed by the discourse context), as examples such as the following illustrate:

(13) (a) He fought in the civil war, but I don't know *which side for*.
      (b) Pierre is an illegal immigrant. He's originally from France but came here from Canada. He'll definitely be deported, but it's not clear *which country to*.
      (c) SPEAKER A: He plays shortstop. SPEAKER B: *Which team for*?
      (d) It appears to have been translated, but I can't tell *what language from*.

In relation to (13) Hartman and Ai (2009:107) comment that "the semantics of the antecedent clause implies a given restricted set of options, satisfying both the focus and D-linking requirements." This is not the case in (12c), because complaints do not entail or imply that there is a course that the complaint is about.

Examples like (11) and (13) provide empirical evidence that (in appropriate contexts), wh-phrases can indeed be Swiped, contrary to van Craenenbroek's claim that only wh-words can function as operators and undergo Swiping. However, as an anonymous reviewer points out, wh-phrase Swiping could be accommodated within van Craenenbroek's analysis if "the stipulation concerning a wh-phrase/wh-word asymmetry with respect to variable binding is dispensed with." We could then suppose that wh-movement in (9d) can move a *wh-phrase* to Spec-CP (not just a wh-word). Indeed, given that wh-movement in non-elliptical wh-questions like *Which store did you buy it from?* can target wh-phrases, it would be surprising if this were not the case in Swiping structures as well.

3.3 Other issues

The assumption that Swiping involves movement of a PP containing a focused preposition to Spec-CP$_2$ raises the question of why Swiping does not allow *phrasal* material to be focused by being stranded in Spec-CP$_2$, giving rise to Swiped clauses such as that italicised below, where the Swiped clause is intended to have an interpretation paraphraseable as 'who they have traced the FATHERS of'.

(14) The police are trying to trace the mothers and fathers of the children involved in the shooting. *I know they have traced the MOTHERS of all the children, but I don't know *who the FATHERS of*.

It is not obvious what would exclude this possibility in van Craenenbroek's analysis.

A further question left unanswered by van Craenenbroek's analysis is why a Swiped preposition cannot be modified by an adverb like *straight/right*—as we see from the ungrammaticality of the italicised Swiped string in (15B) below (in contrast with the grammaticality of the unswiped string *straight from where*):

(15) SPEAKER A: He has come straight here.
      SPEAKER B: **Where straight from*?

Under van Craenenbroek's analysis, the PP *straight from where* would move to the edge of CP$_2$, and *where* would then move to the edge of CP$_1$, stranding *straight from* on the edge of CP$_2$, and thereby wrongly predicting that (15B) is grammatical. It would not be possible to resolve this problem by positing that PP is a phase (Abels 2003; Collins 2007; Drummond et al. 2010) and claiming that the presence of *straight* in Spec-PP prevents *where* from moving to Spec-PP, since heads can in principle have multiple specifiers (Chomsky 2013:19).[6]

Furthermore, van Craenenbroeck's assumption that the clause periphery in Swiping structures comprises two adjacent CP projections (an outer one housing the interrogative wh-constituent and an inner one housing the focused preposition) raises the question of how to deal with Swiped clauses like those highlighted below, where an underlined phrase/clause intervenes between the italicised wh-constituent and the bold-printed preposition:

(16)   (a)   "Manchester United should definitely sell Rooney." "*Who*, *in your view*, **to**?
       (b)   "My son was sent to jail." "*What*, *if you don't mind me asking*, **for**?"
       (c)   I know medical help is available 24/7, but I'm not sure *where*, *at this time of night*, **from**.
       (d)   They arrested me, but I've no idea *what*, *in all honesty*, **for**.
       (e)   I'm sure the house will sell. I'm just not sure *how much*, *in present market conditions*, **for**.
       (f)   I know they were defeated in their last three games, but I can't remember *who*, *in their most recent game*, **by**.

One solution would be to take the underlined constituents to be parentheticals adjoined to CP$_2$, but this poses two problems. Firstly, if CP$_2$ is the locus of Focus in the sense that constituents on the edge of CP$_2$ are interpreted as focused, this would potentially wrongly predict that the underlined constituents are focused. Secondly, the clear intonation break preceding and following the intervening material (marked by commas) makes it plausible to suppose that it is contained within a separate projection.[7] After all, we see from examples like (17) that (for instance) a conditional clause like that italicised below is associated with comma intonation if positioned in the clause periphery, but not if positioned clause-internally:

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[6]See (28a) for an example of licit extraction out of a PP containing *straight*. An anonymous reviewer points out that the ungrammaticality of (15B) could be accounted for under van Craenenbroek's analysis by supposing that *straight* is stranded in Spec-CP and thereby interpreted as being focused. It would then follow that *straight* could not be focused in the context in which it occurs in (15B) because (15B) is a response to (15A), and *straight* is given in (15A). However, even in a more felicitous context, independent principles would arguably rule out the possibility of a discontinuous string like *straight...from* being focused.

[7]However, as anonymous reviewers point out, the relevant observations could be accommodated under van Craenenbroek's analysis if parenthetical adjuncts are associated with comma intonation, and if the specifier of CP$_2$ is interpreted as focused but not a parenthetical adjunct adjoined to it. We note in passing that sentences like (16) pose a severe problem for Merchant's (2002) analysis of Swiping as involving adjunction of a wh-word to a preposition—as do sentences like (11) and (13) which involve Swiping of a wh-phrase rather than of a wh-word.

(17)   (a)   Miranda said that she would withdraw her complaint *if he apologised*.

         (b)   Miranda said that, *if he apologised*, she would withdraw her complaint.

And Rizzi (1997:285) notes that a topic occupying the specifier position in a TopP projection in the clause periphery is "characteristically set off from the rest of the clause by comma intonation"—as can be illustrated by the following authentic examples (which we recorded from live, unscripted radio broadcasts) of embedded *that*-clauses containing (italicised) peripheral *topics*, and other (underlined) local peripheral prepositional or clausal modifiers:

(18)   (a)   You just get the feeling that, *Arsenal*, *the way they keep the ball*, it's particularly clever, isn't it? (Steve Claridge, BBC Radio 5)

         (b)   I just felt that, *Roy Hodgson*, *a few weeks ago*, *when Liverpool lost to Everton*, he was in a minority of one. (John Motson, BBC Radio 5)

         (c)   That tells you that, *at the highest level*, *the big teams*, they don't fancy it. (Darren Lewis, Talk Sport Radio)

An alternative solution for sentences like (16) within the spirit of van Craenenbroeck's *CP shell* analysis would be to posit a third CP projection between CP_1 and CP_2 housing the intervening constituents.

A further issue, explicitly acknowledged by van Craenenbroeck (2010:263; fn. 5), is that the derivation in (9) provides no answer to the question of why there is no auxiliary inversion in a Swiped root clause like that in (8B)—e.g. why speaker B does not produce the PF structure in (19a) below, and spell this out as the string (19b):

(19)   (a) $[_{CP1}$ what $[_{C1}$ ø] $[_{CP2}$ $[_{PP}$ $[_P$ about] $t_{WH}]$ $[_{C2}$ did] $[_{TP}$ ~~Ed write a book~~ ~~t_{PP}~~]]]

         (b)   *What about did?

After all, Auxiliary Inversion is obligatory in root wh-questions like *What did Ed write a book about?* so we should expect Swiping in a root clause to leave behind an inverted auxiliary in the C^o position of CP_2 once Sluicing deletes its TP complement. An answer in keeping with the CP shell approach adopted by van Craenenbroeck would be to suppose that beneath the CP_2 constituent housing the focused preposition there is a further CP projection housing the inverted auxiliary, and this lower CP undergoes Sluicing in the PF component.[8]

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[8]The *auxiliary inversion* problem also arises in other analyses which take Swiping to involve Sluicing of TP (e.g. Merchant 2002; Nakao 2009; Aelbrecht 2010), and a number of (more or less *ad hoc*) ways have been suggested for dealing with the problem (see e.g. Lasnik 1999, 2001, 2013; Boeckx and Stjepanovic 2001; Merchant 2001, 2008). One is to suppose that Subject-Auxiliary Inversion/SAI takes place after Sluicing: TP-deletion would then remove the auxiliary to be inverted. Another is to posit that SAI is triggered by a feature on the auxiliary rather than by a feature on C, with the consequence that the feature on the auxiliary requiring it to be inverted is deleted when the auxiliary is deleted. A third is to take SAI to involve movement of a feature on T to C. An anonymous reviewer suggests a fourth possibility, whereby P adjoins to the empty C^o in CP_1 to derive (i), and Sluicing then deletes CP_2, deriving (ii)

     (i) $[_{CP1}$ what $[_{C1}$ about] $[_{CP2}$ $[_{PP}$ $[_P$ $t_P]$ $t_{WH}]$ $[_{C2}$ did] $[_{TP}$ Ed write a book $t_{PP}]]]$

     (ii) $[_{CP1}$ what $[_{C1}$ about] $e]$

However, postulating one additional CP housing circumstantial adjuncts and another housing inverted auxiliaries would mean that a Swiped root question like *Who, in your view, to?* in (16a) would have the following (simplified) syntactic structure:

(20) $[_{CP1}$ Who $[_{CP2}$ in your view $[_{CP3}$ to $[_{CP4}$ should $[_{TP}$ they sell Rooney$]]]]]$

If Sluicing is treated as involving CP ellipsis, we could then suppose that CP_4 subsequently undergoes ellipsis at PF. But if Sluicing is CP deletion, the question then arises of why Sluicing targets CP_4 in (20), rather than one of the three other CP projections (e.g. CP_3). We can provide a principled answer to this question if we suppose that each of the four CPs in (20) represents a different type of peripheral projection with a different function. Thus, CP_1 houses the fronted interrogative constituent *who*, CP_2 houses the adjunct *in your view*, CP_3 houses the focused preposition *to*, and CP_4 houses the inverted auxiliary *should*. The different functions of each of the CP projections in (20) can be captured in a principled fashion if we adopt the cartographic approach pioneered by Rizzi (1997), where each peripheral projection has a dedicated functional head licensing a different type of constituent on the edge of its projection. In the next section, we show how refining and extending van Craenenbroeck's analysis and re-casting it in cartographic terms can give us greater insight into the syntax of Swiping in English.

4 Refining van Craenenbroek's analysis

In this section, we outline a more articulated multiple-projection analysis of Swiping which refines van Craenenbroeck's CP shell analysis of the clause periphery, and which is more firmly rooted in the cartographic analysis of the clause periphery pioneered by Rizzi (1997). We begin by outlining our analysis, before going on to examine specific assumptions embodied in it in more detail.

4.1 A cartographic analysis

A core assumption of our analysis is that Swiped clauses always contain (at least) three separate peripheral projections, viz. (i) a Force Phrase/ForceP constituent marking the Swiped clause as interrogative in type;[9] (ii) a Focus Phrase/FocP constituent housing the fronted focused preposition; and (iii) a Finiteness Phrase/FinP constituent whose head is the landing site for inverted auxiliaries in structures which undergo


However, this solution is problematic for two reasons. Firstly, van Craenenbroeck argues that the locus of Focus is CP_2, so an analysis like (i,ii) would fail to account for how the preposition comes to be focused when Swiped. Secondly, CP_1 is taken to be the locus of Force by van Craenenbroeck, so it is not obvious what would drive movement of the preposition to the edge of an interrogative Force projection, since the preposition is not interrogative.

[9]Huddleston (1994) argues that (illocutionary) force is a pragmatic rather than a syntactic notion, and that its syntactic counterpart is clause *type* (see also Cheng 1991); this would argue in favor of replacing ForceP by TypP. However, we continue to use the label ForceP here because it is widely adopted in the cartographic literature.

Subject-Auxiliary Inversion (Branigan 2005). We further suppose that FinP (like ForceP) is a phase (Branigan 2005), and that phase heads and criterial heads can have an edge feature triggering movement to their specifier position: in consequence of FinP being a phase, constituents moving to a criterial position in the periphery will transit through FinP (Haegeman 1996). In conformity with this, we shall claim that the fronted prepositional phrase in Swiping structures first moves to Spec-FinP, and then subsequently the focused preposition moves to Foc^o in order to mark it as focused, and its wh-interrogative complement moves to Spec-ForceP in order to type the clause as a non-echoic wh-question. In addition we posit that inverted auxiliaries move from T^o to Fin^o, and that Sluicing involves deletion of FinP (and not of TP). Finally, we follow Rizzi (1997:332; fn. 28) in supposing that "force and finiteness can be expressed in a single head, and that this option is enforced by economy" wherever possible. However, syncretism of Fin and Force will not take place where some other peripheral projection intervenes between ForceP and FinP, nor where FinP is sluiced but ForceP is not (as we claim happens in sluiced clauses like that italicised in 'He's gone, but I have no idea *where*').
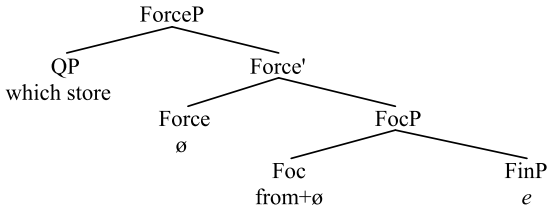
In the light of these assumptions, let's take a closer look at the derivation of a Swiped clause like that in (11f) *Which store from?* (e.g. in a context like 'Do you like the new iPhone? Will you buy it? If so, *which store from*?') The wh-PP *from which store* originates as a constituent of the TP *you will buy it from which store*. Immediately above TP is a phrasal FinP projection whose Fin^o carries an edge feature triggering movement of the PP *from which store* to Spec-FinP; Fin^o also has a T-feature in questions (perhaps inherited from a root interrogative Force head, in much the same way as Chomsky 2008 argues that uninterpretable agreement features on T^o are inherited from C^o) and this attracts the finite auxiliary *will* to move to Fin^o. Above FinP is a FocP projection, headed by a Foc^o which attracts P-*from* to adjoin to it, thereby marking the preposition as focused. Above FocP is an interrogative ForceP projection headed by a $Force^o$ constituent which attracts the interrogative wh-phrase *which store* to move to Spec-ForceP, so typing the clause as a non-echoic wh-question. This results in the periphery of the sentence having the superficial syntactic structure shown below (simplified by not showing the internal structure of TP):

(21)
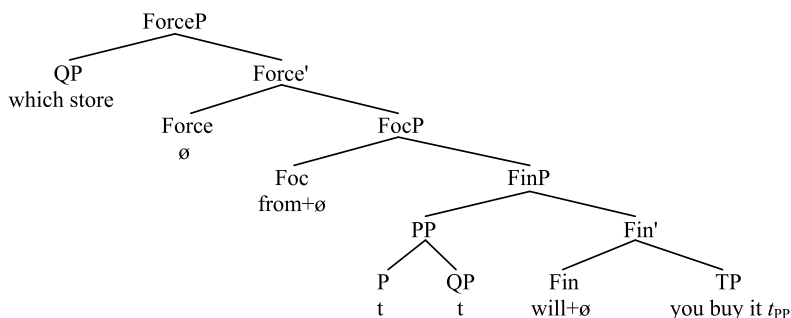
The FinP constituent then undergoes ellipsis in the PF component and so is not lexicalised, with the result that the syntactic structure in (21) is mapped into the corresponding PF structure (22) (where *e* marks ellipsis):

(22)

```
                        ForceP
                   ╱            ╲
                 QP              Force'
            which store       ╱        ╲
                           Force         FocP
                            ø         ╱      ╲
                                   Foc        FinP
                                 from+ø          e
```

Consequently, only the string *which store from* has an overt spellout at PF. As should be obvious, our analysis can be extended in a straightforward fashion to deal with Swiping in embedded clauses like that italicised in:

(23)   I will certainly buy it, but I'm not sure *which store from*.

The embedded Swiped clause italicised in (23) will have a derivation parallel to that in (21)–(22), except that the auxiliary *will* remains in situ in Tᵒ throughout the derivation, because Finᵒ does not have a T-feature triggering Subject-Auxiliary Inversion in embedded questions.

A question arising from our analysis in (21)–(22) is what drives the movement operations involved in Swiping. In relation to movement of the wh-PP to the edge of FinP, it should be noted that Haegeman (1996) argues that any constituent moving to a position in the clause periphery must transit through the edge of FinP, and Branigan (2005) develops this idea further by arguing that FinP is a phase. Finᵒ (by virtue of being a phase head) can carry an edge feature enabling it to trigger movement of the PP *from which store* to Spec-FinP. We assume (as noted earlier) that Finᵒ in root questions also carries an uninterpretable T-feature which drives the T-auxiliary *will* to adjoin to Finᵒ; it cannot attract TP to move to Spec-FinP, since this would induce violation of an Antilocality condition barring phrase-internal movement (Abels 2003; Grohmann 2003; Boeckx 2007). Focᵒ carries an uninterpretable F(ocus)-feature, and this attracts a focused constituent to move to a criterial position on the edge of FocP: since only the preposition *from* is focused, the F-feature on Focᵒ attracts the preposition *from* to adjoin to Focᵒ, thereby marking the preposition as focused. In addition, Forceᵒ has an edge feature triggering movement of the interrogative QP *which store* to its criterial position in Spec-ForceP, thereby typing the overall clause as interrogative in Force.

Having presented a general outline of our analysis, we now turn to examine specific aspects of it in more detail.

4.2 Sluicing as FinP deletion

A key claim embodied in our analysis is that Sluicing involves ellipsis of FinP rather than (as assumed in earlier work) TP—a claim made implicitly by Hasegawa (2006; fn. 5), and explicitly by Baltin (2010) and Hiraiwa and Ishihara (2012:167). Evidence that Sluicing in English involves FinP deletion comes from the observation by Baltin (2010) that *wh + that* varieties of English (i.e. varieties of English like Belfast English

which allow a wh-constituent to be followed by *that*) do not allow Sluicing to leave *that* behind. Thus, although a sentence like (24a) is fine in Belfast English, its Swiped counterpart (24b) is not:

(24) (a) They discussed a certain model, but I don't know *which model* **that** they discussed.
      (b) They discussed a certain model, but I don't know *which model* (***that**).

Why so? Baltin argues that the complementiser *that* following *which model* in (24a) is a finiteness marker, occupying the head Fin° position of FinP. If (as Baltin argues), Sluicing involves FinP deletion, it follows that Sluicing will delete the whole of FinP in (24b), including the complementiser *that* in Fin°. A similar restriction holds in cases of Swiping, as we see from the (un)acceptability of sentences such as the following in Belfast English (kindly confirmed by Alison Henry):

(25) (a) She gave it away, but I have no idea *who to*.
      (b) *She gave it away, but I have no idea *who to that*.
      (c) *She gave it away, but I have no idea *who that to*.

The pattern in (25) is precisely as expected under our analysis. Example (25a) is grammatical with *to* in Foc°, *who* in Spec-ForceP and Sluicing of FinP. Example (25b) is "really bad" (Alison Henry, p.c.) because *that* (as Baltin argues) occupies Fin°, and Swiping involves Sluicing of FinP. Example (25c) is also really bad (meriting "several stars", Alison Henry p.c.) and is out because *that* is illicitly positioned in Force° (rather than Fin°), and since it has the overt specifier *who*, this leads to violation of the Doubly Filled COMP Filter barring a peripheral projection from having an overt head and an overt specifier (Chomsky and Lasnik 1977; Koopman 2000; Koopman and Szabolsci 2000; Collins 2007; Baltin 2010; Collins and Radford 2013).

Furthermore, the assumption that Swiping involves FinP deletion is compatible with the claim made by Aelbrecht (2009, 2010) that Sluicing can involve two peripheral heads, one which serves as the *licenser* for ellipsis, and another carrying an ellipsis feature which triggers deletion (more specifically, non-lexicalisation) of its complement. Aelbrecht claims that the head licensing Sluicing is an interrogative Force head in English, and that the head triggering ellipsis in cases of Swiping is Foc°. Under the cartographic analysis of Rizzi (1997) the complement of Foc° is FinP, and hence Sluicing of FinP in (22) is consistent with Aelbrecht's assumptions about licensing and triggering. More specifically, the head licensing Sluicing is the highest head in the ForceP phase, and the head triggering ellipsis of FinP is the lowest head in the ForceP phase (viz. the head that selects the FinP phase as its complement, namely Foc° in the case of (21)–(22)). In a clause where there is no other peripheral projection intervening between ForceP and FinP, ForceP will not only *license* Swiping (by virtue of being the highest head within the ForceP phase) but will also *trigger* Swiping of its FinP complement (by virtue of also being the lowest head within the ForceP phase).

4.3 Preposition focusing as head adjunction

A second key assumption embodied in our analysis is that the focusing of the preposition comes about by head adjunction of the focused preposition to Foc°.[10] An anonymous reviewer objects that there are no precedents in the literature for treating Focus Movement as involving movement of a head to Foc°, rather than treating it (as in van Craenenbroek's analysis) as involving movement of a phrase to Spec-FocP. However, we maintain that our analysis overcomes problems that arise under van Craenenbroek's analysis. For example, under his analysis the whole PP *about what* moves to the specifier position of the inner (focus-marking) CP: this is problematic, since (as noted in Sect. 3.1) the whole PP will then be in a criterial position on the edge of FocP, and the Criterial Freezing Condition will prevent *what* from subsequently moving to the edge of the outer CP. By contrast, under our analysis, neither problem arises since only the focused preposition moves to the edge of FocP.

Moreover, there is empirical evidence in support of our head-adjunction analysis. One source of such evidence comes from Merchant's (2002:fn. 5) observation that (as illustrated below) only simplex (single-word) prepositions like *over* can undergo Swiping, not complex (multi-word) Ps like *because of*:

(26)   I know they fell out, but I don't know *what over*/**what because of*.

If we make the reasonable assumption that only simplex Ps can undergo head adjunction, our analysis provides a straightforward account of the contrast in (26), since only a simplex P like *over* can adjoin to Foc°, not a complex P like *because of*.[11]

Further evidence in support of our claim that Swiping involves adjunction of P to Foc° comes from the observation made earlier that a Swiped preposition cannot be modified by an adverb like *straight* in a Swiped string like (15b) **Where straight from?* Under our analysis, this can be accounted by supposing that we have an initial structure like, *He has come here straight from where* (where *straight* is the specifier

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[10]Although adjunction of the preposition to Foc seemingly induces constraint violations (e.g. violation of the Head Movement Constraint of Travis 1984), the relevant violations are obviated by Sluicing, as we will see in Sect. 4.4.

[11]We employ the term 'complex preposition' here to denote a phrasal expression comprising more than one independent word (e.g. *because of, in spite of, instead of, on top of*). Our use of this term thus differs from that of Merchant (2002; fn. 5), since he analyses some single-word prepositions like *above, before, between, despite, during, into, regarding*, and *underneath* as complex prepositions (although he does not say what the criteria for this classification are). There seems to be no ban on the single-word prepositions which Merchant classifies as complex undergoing Swiping, as the following internet-sourced examples illustrate:

   (i)   Will humans ever evolve again, and if so *what into*?
          [http://uk.answers.yahoo.com/question/index?qid=20100812122744AAwF7i4]
   (ii)   I'll be out on Saturday and I know I'll be back for football... I just dont know *when before*
          exactly.
          [http://maryland.247sports.com/Board/56/NCAA-Football-11-360-Dynasty-Thread-
          Recruiting-56834/7]

See also further counterexamples to Merchant's story about single-word complex prepositions in Beecher (2007). By contrast, we are not aware of any examples of Swiping with phrasal prepositions.

of *from where*). The PP *straight from where* moves to Spec-FinP, *has* adjoins to Fin°, *from* adjoins to Foc°, and *where* moves to Spec-ForceP. This leaves *straight* stranded on the edge of FinP, as in (27) below (simplified by not showing the internal structure of TP):

(27)   [ForceP *where* [Force ø] [FocP [Foc **from+ø**] [FinP straight ~~from where~~ [Fin has] he come here]]]

Sluicing of FinP in the PF component will then elide the whole FinP (including *straight*), so that only the string *Where from?* is overtly spelled out (and if *Where from?* is used as a rejoinder to 'He has come straight here', it will have an interpretation paraphraseable as 'straight from where?'). In sentences where there is no 'antecedent' for *straight* in the matrix clause, Sluicing of the FinP containing *straight* will be barred by a recoverability condition on deletion (Chomsky 1964). Moreover (as an anonymous reviewer points out), the illicit movements in (27) may also fall foul of a PF condition which bars the specifier of a PP from being stranded inside a (bracketed) PP with no overt head—a constraint which gains empirical support from contrasts such as the following:[12]

(28)   (a)   This is the place *which* the sniffer dogs led the police [straight to]
        (b)   *This is the place *to which* the sniffer dogs led the police [straight]

An additional factor barring Swiped prepositions from being modified may be an adjacency requirement on head adjunction blocking head movement across an intervening specifier like *right* (akin to the strict adjacency condition on Subject Auxiliary Inversion/SAI argued for in Chomsky 2013, whereby an intervening subject in Spec-TP blocks SAI, thus in effect forcing SAI to take place before the subject is raised to Spec-TP).

A further piece of evidence in support of our P-adjunction analysis is the following. Since adjunction of P to Foc and movement of its wh-complement to Spec-ForceP leaves a transitive preposition *from* stranded at PF (i.e. separated from its complement in the sense that it does not symmetrically c-command its complement at PF), our analysis predicts that only prepositions which can be stranded under a movement operation like wh-movement can be stranded under Swiping. From this perspective, the ungrammaticality of *I can't remember what during* in (4) can be related to the ungrammaticality of stranding an adjunct preposition like *during* under wh-movement in sentences like:

(29)   **What* did Ian fall asleep **during**?

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[12]The editor notes that the idea that *straight* cannot be stranded by head movement gains independent empirical support from the observation that *straight* cannot occur in verb-particle constructions in which the particle is to the left of the object, regardless of whether *straight* is placed to the left of the particle or to the right of the object:

(i)   He put the book straight down.
(ii)   He put <*straight> down the book <*straight>.

See den Dikken (1995) on the idea that *straight* prevents particle incorporation.

However, the constraint on stranding adjunct prepositions turns out not to be absolute, since research suggests that they can be sometimes be stranded in Swedish (Starke 2001:40; fn. 10), German (Truswell 2007, 2009, 2011), and Spanish (Fábregas and Jiménez-Fernández 2012). Interestingly, adjunct prepositions which can be stranded under wh-movement in sentences like (30) in English can also be stranded under Swiping in sentences like (31):

(30)   (a)   *What* did he fall asleep complaining [about]? (Chaves 2012:468 (5a))
       (b)   *Who* would you rather sing [with]? (Chaves 2012:468 (5g))
       (c)   Why should he hate the fact that his players actually have an allegiance to their former boss, *who* they won trophies [under]. (Ian McGarry, BBC Radio 5)

(31)   (a)   He fell asleep complaining, but I've no idea *what about*.
       (b)   He hasn't yet decided what duet he is going to sing or *who with*.
       (c)   I know Liverpool won the Champions League, but *who under* I can't remember.

Thus, our analysis captures the generalisation that only a preposition which can be stranded (by movement of the preposition and/or its complement) can be Swiped.[13]

Our head-adjunction analysis also accounts for why phrasal material cannot be focused in structures like:

(14)   The police are trying to trace the mothers and fathers of the children involved in the shooting. *I know they have traced the MOTHERS of all the children, but I don't know *who the FATHERS of*.

The reason is that the DP *the FATHERS of who* moves to Spec-FocP, and subsequent extraction of *who* out of this DP leads to a violation of the Criterial Freezing Condition/CFC (discussed earlier in relation to (10)), because the focused DP *the FATHERS of who* is in its criterial position on the edge of FocP and hence will not allow *who* to be extracted out of it; and self-evidently this CFC violation cannot be repaired by Sluicing FinP. By contrast, as we will see in the next section, focusing a preposition via head adjunction to Foc leaves behind an illicit trace on the edge of FinP which is erased by subsequent Sluicing of FinP.

4.4 Obligatoriness of Sluicing

An important question arising from our analysis is why Sluicing is obligatory in Swiping structures, as we see from the observation that without Sluicing, (21) yields

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[13]It may be that structures such as the following provide further motivation for heads being focused by adjoining to Foc^o:

(i)   John has a job, but he won't tell me *what doing*. (Hartman 2007:48)

Sentences like (i) can be treated as instances of head focusing, if the VP *doing what* moves to the edge of FinP, then *doing* adjoins to Foc^o, and *what* moves to Spec-ForceP. However, see Larson (2013) for an alternative analysis.

the ungrammatical outcome *Which store from will you buy it?* Why should this be? The answer we offer here is consonant with the claim made by van Craenenbroeck (2004, 2010) that Sluicing repairs constraint violations, and with the more specific claim by Merchant (2003, 2008) that Sluicing repairs structures by removing traces which are illicit at the PF interface.

Under our analysis, both movement of P to Foc° and movement of its wh-complement to Spec-ForceP induce violation of locality constraints. One such constraint is the Edge Condition of Chomsky (2008), which bars subextraction out of a constituent on the edge of a phase. When the PP *in which store* moves to the edge of FinP in (21), it is on the edge of a FinP phase, and so subsequent movement of *for* to Foc and of *which store* to ForceP induce violations of the Edge Condition.

A more general constraint which also bars both movements is the *Freezing Constraint* (Wexler and Culicover 1980; Uriagereka 1999), which is given the following characterisation by Müller (2010:56 (30)):

(32)   A trace *t* may not be included in a moved XP (i.e., an XP that binds a trace) if the antecedent of *t* c-commands XP.

The unsliced structure in (21) violates the Freezing Constraint (32) because the PP on the edge of FinP binds a trace within TP and also contains two traces which are bound from outside PP.[14]

Moreover, adjunction of the preposition *from* to Foc° will also violate the Head Movement Constraint/HMC of Travis (1984), since HMC allows the head X° of XP to adjoin to the head Y° of YP only if XP is the complement/sister of Y°. However, PP is clearly not the complement/sister of Foc° in (21), but rather is the specifier of the FinP complement of Foc°. If locality constraints are interface conditions (Chomsky 2005:1) and if they are representational (Bošković 2011:6), HMC can be formulated in representational terms as barring the head Y° constituent of YP from containing a trace at PF unless that trace is bound by an X° head which is the sister of YP.

Having answered the question of why the unsliced structure in (21) is ungrammatical, let us now turn to address the question of why its sliced counterpart in (22) is grammatical. The answer is that FinP deletion removes both of the illicit traces on the edge of FinP at PF, and thereby 'repairs' the structure. It is interesting to note that neither VP Ellipsis in (33a) nor TP Ellipsis in (33b) can serve a similar repair function, as we see from the ungrammaticality of:

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[14] An anonymous reviewer suggests that the robustness of the Edge Condition and the Freezing Constraint is undermined by potential counterexamples like the Spanish sentence below, attributed to Esther Torrego in Chomsky (1986:26):

(i)   *¿De qué   autora* no sabes   [qué   traducciones] han   ganado premios internacionales?
        of   which author not you.know which translations   have won   awards international
        'By which author don't you know which translations have won international awards?'

At first sight, it might appear that the italicised wh-phrase has been extracted from within the bracketed fronted wh-phrase located on the edge of a CP phase, in apparent violation of the Edge and Freezing conditions. However, Gallego (2007:340) argues that in such sentences, "The alleged sub-extracted PP is actually base generated outside the embedded wh-phrase, as a PP dependent of the matrix verb: an aboutness phrase." He amasses a considerable body of evidence in defence of this view (Gallego 2007:335–354) and additional support is provided by Boeckx (2012:131–132).

(33)   (a)   *Which store from will you ~~buy it~~?
        (b)   *Which store from will ~~you buy it~~?

This is because ellipsis of the VP *buy it* or the TP *you buy it* both leave the illicit traces on the edge of FinP in (21) intact. However, Sluicing FinP in the PF component maps the syntactic structure (21) into the PF structure (22), and (22) no longer contains any traces, and hence no longer violates PF locality constraints. This is in line both with more general claims that certain kinds of ellipsis operations can repair constraint violations (e.g. Chomsky 1972; Lasnik 1995, 2001; Kennedy and Merchant 2000; Johnson 2001; Fox and Lasnik 2003; Hornstein et al. 2003; Merchant 2003, 2008; Park 2005; Boeckx and Lasnik 2006; van Craenenbroeck and den Dikken 2006; Bošković 2011), and with more specific claims that Sluicing can serve such a repair function (Ross 1969; Merchant 2001, 2004, 2006, 2008; van Craenenbroeck 2004, 2010; Nakao 2009).[15]

4.5 Intervention

Our analysis can account for the possibility of material intervening between the wh-constituent and its governing preposition, e.g. in sentences like (16f), 'I know they were defeated in their last three games, but I can't remember *who*, *in their most recent game*, **by**.' The intervening material is a local circumstantial adjunct, which following Rizzi (2001) we take to be directly merged in situ in a Modifier Phrase/ModP projection in the clause periphery, and which (following Haegeman 2012) we take not to be a barrier to movement of other constituents across it. On this view, the Swiped clause in (16f) will have the PF structure below (where *e* represents the elided FinP):

(34)   [$_{\text{ForceP}}$ *who* [$_{\text{Force}}$ ø] [$_{\text{ModP}}$ *in their most recent game* [$_{\text{Mod}}$ ø] [$_{\text{FocP}}$ [$_{\text{Foc}}$ **by**+ø] *e*]]]

Since (34) contains no illicit traces, our analysis correctly specifies that sentences like (16f) are well-formed. By contrast, if ModP is replaced by a constituent containing a fronted argument (e.g. a fronted topic), the resulting sluiced sentence (35a) where the sluiced clause has the structure in (35b) is ungrammatical, as pointed out by Liliane Haegeman (pc):

(35)   (a)   *He's given away his possessions including his Rolls Royce, but I'm not sure [*who the Rolls* **to**]
        (b)   [$_{\text{ForceP}}$ *who* [$_{\text{Force}}$ ø] [$_{\text{TopP}}$ *the Rolls* [$_{\text{Top}}$ ø] [$_{\text{FocP}}$ [$_{\text{Foc}}$ **to**+ø] *e*]]]

This is because movement of the interrogative operator *who* across the intervening specific DP argument *the Rolls* induces an intervention effect: see Starke (2001),

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[15]An alternative account of the repair function of Sluicing in cases of Swiping may be achievable within the phase-based account of linearization developed in Fox and Pesetsky (2003, 2005) and Drummond et al. (2010). One story along these lines would be that by the end of the FinP phase, the preposition is linearized as preceding its wh-complement, but subsequent movement operations result in the complement preceding the preposition, leading to contradictory linearization statements. Sluicing of FinP (and of the linearization statements relating to it) eliminate this ordering contradiction. See Sect. 5.2 for related discussion.

Rizzi ([2004](#)), Endo ([2007](#)), Friedmann et al. ([2009](#)) and Haegeman ([2012](#)) for discussion of such effects (and see also the discussion in Sect. [5.4](#)).[16]

4.6 Auxiliary inversion

A core assumption embodied in our analysis in ([21](#))–([22](#)) is that an inverted auxiliary moves into (and remains in) Fin in contexts where English requires Subject-Auxiliary Inversion. This is contrary to the assumption made in Rizzi ([1997](#)) that in interrogative/negative inversion structures, the interrogative/negative constituent moves into Spec-FocP and the inverted auxiliary moves into Foc in order to satisfy the Focus Criterion of Rizzi ([1996](#)). However, we maintain that inverted auxiliaries move only as far as Fin and do not move further into Foc.

Empirical evidence for assuming that inverted auxiliaries are in Fin rather than Foc comes from the phenomenon of *non-adjacent inversion* in sentences like ([36](#)), where an underlined inverted auxiliary is separated from the italicised phrase which licenses the relevant inversion by (one or more) intervening bold-printed constituents:

(36)   (a)   *Under what circumstances* **during the holidays** *would* you go into the office? (Sobin [2003](#):193)

          (b)   *At what time of year* **in Scotland** *do* they eat haggis? (Hudson [2003](#):609, 8b)

          (c)   *Where*, **in your view**, *did* Roy Hodgson get things wrong?

          (d)   *Why*, **the following morning**, do you think he flew to Paris?

          (e)   I swear that *on no account* **during the holidays** *will* I write a paper. (Haegeman [2012](#):23, fn. 19, (i)b)

          (f)   I can assure you that *no personal information* **to anyone I didn't know** *would* I ever divulge.

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[16]The contrast between ([34](#)) and ([35](#)a) could in principle be accounted for in selectional terms, e.g. by positing that Force[o] in a Swiped clause can have a ModP complement but not a TopP complement. However (as noted by an anonymous referee) it would be preferable to follow Abels ([2012](#):251) in positing that the relative ordering of peripheral projections is predictable from locality constraints on movement, and that peripheral projections "do not need to be ordered by selectional requirements but can be merged freely. Derivations where the heads are merged in the wrong order will be filtered out because the heads will then not be able to attract their appropriate specifiers without violating locality" (Abels, ibid.). An anonymous reviewer suggests that the contrast between ([34](#)) and ([35](#)) could alternatively be handled by positing that the intervening (underlined) material in ([35](#)a) is adjoined to FocP. Another anonymous referee asks what bars Sluicing in a clause like that italicised below:

(i)   *He says he is going to give away all his possessions, but I'm not sure *when his Rolls Royce*.

One possible answer is that FinP in (ii) is the complement of a Top head whose specifier is the fronted topic *his Rolls Royce*, and Top heads (unlike Focus heads) do not trigger Sluicing. However, this cannot be the whole story, since even an unsluiced structure like (iii) is ungrammatical:

(ii)   *I'm not sure *when his Rolls Royce he's going to give away*.

If the italicised clause in (ii) derives from a structure loosely paraphraseable as *He is going to give away his Rolls Royce when*, it may be that there is an *intervention* violation incurred by the fronted wh-constituent moving across the fronted tropicalized argument *his Rolls Royce*.

(g) He prayed that *never again* **atrocities like these** *would* he witness. (Haegeman 2012:48, fn. 46, (i)a)

In addition, Haegeman (2012:48–50) cites the following authentic newspaper examples of non-adjacent inversion:

(37) (a) So *how*, **from this**, *does* the team conclude that risks to mothers who have Caesareans are actually 2.7 times greater? (*Independent*, 30.01.2010, p. 26, col. 2)

     (b) So to turn this around and fulfill New Labour's historic mission, *to whom* **at last** *will* the government turn? (*Guardian*, July 19, 2005:6, col. 5)

     (c) I do think there is a good case for asking ourselves *what* **therefore** *can* we do to enable these people who have been in [education] three years to stay here? (*Guardian*, August 28, 2001:1, col. 3)

     (d) With house prices falling, petrol prices soaring and credit crunching, *what*, **in May 2008**, *do* you think the Great British public did with their dwindling cash reserves? (*Observer*, June 22, 2008:26, col. 3)

     (e) *At no point* **the evening before** *had* I felt at risk. (*Guardian*, May 4, G2, 2011:10, col. 1)

And Sobin (2003) reports high acceptability scores for similar sentences in an experimental study.[17] By contrast an inverted auxiliary cannot be positioned above other peripheral material, as the ungrammaticality of examples such as the following illustrates:

(38) (a) **Why do*, **in Scotland**, they eat haggis?
     (b) **How does*, **from this**, the team conclude that mothers are at risk?
     (c) **In what circumstances do*, **during the exam**, you allow students to use notes?
     (d) **Where did*, **in his team selection**, Roy Hodgson get things wrong?

Sentences like (36–38) thus provide empirical support for the claim embodied in our analysis that an inverted auxiliary raises to (and remains in) the head Fin^{o} position of the FinP phase; accordingly, the inverted auxiliary is deleted under Sluicing of FinP in the PF component.

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[17]The editor points out that the evidence for non-adjacent inversion provided by sentences like (36) and (37) is weakened by two factors. Firstly, the bold-printed and italicized strings in some cases may form a single constituent (e.g. *at no point the evening before* in (37e))—and indeed Costa (2004) and Haegeman (2012) treat some such cases in this way. Secondly, in other cases the bold-printed constituents may be parenthetical adjuncts which are not syntactically integrated into the structure containing them (e.g. *in your view* in (36d)). However, some of the examples in (36), (37) are not amenable to either analysis: e.g. the bold-printed constituent is a fronted argument of *divulge* in (36f), *witness* in (36g) and *conclude* in (37a); and in (36d) the bold-printed constituent is an adverbial nominal adjunct which originates within the embedded clause and moves to the periphery of the matrix clause.

4.7 Long-distance Swiping

So far, all cases of Swiping that we have looked at have involved *local* Swiping (i.e. where the wh-constituent originates within the clause that it ends up in). However, it has been suggested in the literature (Hasegawa 2006:436; Nakao et al. 2006:303, fn. 10; Hartman and Ai 2009:26; van Craenenbroeck 2010:271, fn. 20; Larson 2013:9, fn. 5) that there may also be cases of non-local (or long-distance) Swiping, where the wh-constituent originates in an embedded clause and moves to the front of a matrix clause. Examples like those below suggest that long-distance Swiping can give rise to two different types of outcome:

(39)   A recent poll is predicting the Socialists will win, but I'm not sure

   (a)   *how much* it is predicting **by.**
   (b)   *how much* **by.**

Both outcomes can be accommodated within the cartographic analysis outlined here. In both (39a, b), the Swiped clause derives from a structure paraphraseable as *it is predicting they will win by how much*. In (39a), the PP *by how much* moves to the edge of FinP in the embedded clause (FinP being a phase): *by* then adjoins to a Focus head immediately above FinP, and the QP *how much* moves to the specifier position of the ForceP phase in the embedded clause. From there, *how much* moves until it eventually becomes the specifier of the interrogative ForceP projection in the matrix clause. Sluicing of the embedded clause FinP derives the PF structure shown below (simplified by showing only essential constituents and by not showing null heads):

(40)   [ForceP *how much* [TP it is predicting [ForceP ~~how much~~ [FocP [Foc by] [FinP e]]]]]

Example (40) is spelled out as the PF string *how much it is predicting by* in (39a).[18]

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[18]Recall from Sect. 4.1 that we are following Rizzi (1997:332; fn. 28) in assuming that force and finiteness are expressed as a single head wherever possible. Consequently, the matrix ForceP constituent in (40) will in effect be a syncretised ForceP/FinP projection. An anonymous reviewer asks why *how much* does not remain in situ and type the complement clause as interrogative when it moves to the embedded Spec-ForceP in (40). The answer is that the embedded clause in (40) is declarative, as we see from the possibility of having a *that*-clause paraphrase for it in:

(i)   I'm not sure how much it is predicting [*that* the Socialists will win by]

An interrogative phrase like *how much* can thus only *transit* through a declarative Spec-ForceP position, not remain there (because the specifier position in a declarative CP is not a criterial position for an interrogative constituent). Hence, in a sentence like:

(ii)   What did you say [it cost]?

the interrogative operator *what* transits through Spec-CP in the bracketed embedded clause but does not type the (declarative) embedded clause as interrogative, because only the final derived position of an interrogative operator is relevant to clause typing. In a different use, *predict* can have an interrogative complement and permit Swiping, as in:

(iii)   The polls correctly predicted that the Socialists would win, but they didn't predict *how much by*.

Now consider (39b). The whole PP *by how much* moves through Spec-ForceP in the embedded clause into specFinP in the matrix clause. The focused preposition *by* then adjoins to a Focus head immediately above FinP, and the QP *how much* moves to the specifier position of the ForceP phase in the matrix clause. Subsequent Sluicing of the matrix FinP constituent derives the PF structure shown below:

(41)   [_ForceP_ *how much* [_FocP_ [_Foc_ by] [_FinP_ e]]]

Example (41) is spelled out as the PF string *how much by* in (39b).

5 Issues arising from the cartographic analysis

Having outlined a cartographic analysis of Swiping and discussed specific aspects of it in the previous section, we now turn in this section to address issues arising from it (most raised by anonymous reviewers).

5.1 On focusing

An anonymous reviewer (and the editor) take issue with our claim that only the preposition (not the wh-constituent) is focused in cases of Swiping. They note that it is in the nature of wh-constituents that they request new information, and hence must be focused. However, we maintain that this is a pragmatic (extra-grammatical) rather than a syntactic effect. By virtue of their interrogative force, questioned constituents move to Spec-ForceP in the syntax. However, from a pragmatic perspective, a question will generally only be felicitous if the speaker does not already possess the information he is asking for. This means that questioned wh-constituents are typically interpreted as asking for new information. But this pragmatic effect is extragrammatical, and has no bearing on the question of where interrogative wh-constituents are positioned in the syntax. Support for our claim that questioned constituents move to Spec-ForceP in the syntax comes from sentences such as the following:

(42)   Lee wonders **which students** *under no circumstances at all* would Robin
          talk to. (Haegeman 2012:41(60e))

Here, the negative constituent is focused, Haegeman argues. Given the observation by Rizzi (1997:295) that "there can be an indefinite number of Topics but only one structural Focus position per clause" Rizzi (1997:295), it follows that if the italicised negative constituent is in Spec-FocP, the bold-printed interrogative constituent must be contained within a separate projection. And since *wonder* selects a complement which is interrogative in type/force, it is plausible to conclude that the bold-printed interrogative wh-phrase is in Spec-ForceP and serves to type the embedded clause as a wh-question.

A related objection is raised by an anonymous referee who remarks that Hartman (2007) provides "explicit argumentation that sluiced—and hence by extension Swiped—wh-phrases are necessarily focused." Hartman (2007:15–62) provides an extensive and insightful discussion of these issues, and it would clearly not be appropriate to repeat all of his discussion here. We shall therefore just highlight key points.

Hartman argues that the wh-remnant in cases of Sluicing without preposition stranding in structures like (43) is focused, noting that this accounts for why "a sluiced wh-phrase always bears prosodic stress" (Hartman 2007:16).

(43)   Bill bought me something, but I don't know WHAT. (Hartman 2007:16)

The assumption that a sluiced wh-constituent is focused also accounts for why Sluicing is not possible where a wh-constituent is given—e.g. where the wh-word is repeated from an antecedent clause, as in (44):

(44)   *Mary told me **who** kissed Ann, and Bill told me *who* too. (Hartman 2007:17)

By contrast, Hartman maintains that in cases of Swiping, the preposition alone is focused and carries an information-focus feature, which he denotes as [+iFoc], so that there is "a [+iFoc] feature on the P head" (Hartman 2007:31): unlike the preposition, the wh-constituent carries only a wh-feature not a focus feature, Hartman claims.[19] It follows from these assumptions that in Swiping "the preposition is always given stress," and that "if the wh-word is given stress instead of the preposition, the result is unacceptable" (Hartman 2007:29)—as illustrated earlier in (6) *She fixed it, but God only knows what* WITH/*WHAT *with*. It also follows that the preposition (by virtue of being focused) cannot be given, and hence cannot have a discourse antecedent—as illustrated earlier in (5) *She was complaining* (*about something), *but I don't remember what about*.

Hartman adduces a substantial body of evidence in support of his claim that in cases of Sluicing the wh-constituent is focused, but in cases of Swiping, it is the preposition (and not the wh-constituent) which is focused. For succinctness, we shall mention only one such piece of evidence here, relating to the syntax of what we shall term WH-ANDLs—i.e. interrogative wh-constituents which are modified by aggressively non-D-linking modifiers such as *the hell/the devil/on earth* (in the sense of Pesetsky 1987 and den Dikken and Giannakidou 2002). Hartman (2007:44–48) notes the observation made by Merchant (2002) and van Craenenbroeck (2004, 2010) that WH-ANDLs can undergo Swiping in sentences like (45a), but (as noted by Merchant 2006) cannot undergo Sluicing in sentences like (45b):

(45)   (a)   Mary went dancing, but I don't know *who the hell with*.
        (b)   *Mary went dancing with someone, but I don't know *who the hell*.

Hartman maintains that, by virtue of their ANDL status, WH-ANDLs cannot bear an [i-Foc] feature. Since sluiced wh-constituents are obligatorily focused, this means that WH-ANDLs cannot occur in Sluicing structures like (44b). By contrast, since wh-constituents are not focused in Swiping structures under our analysis (only the

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[19]Since Hartman argues that Swiping only occurs with interrogative wh-constituents, it is clear that by *wh*-feature he means what (in Sect. 5.2) we term a whQ-feature—i.e. a feature attracting a questioned wh-constituent.

preposition is), nothing prevents WH-ANDLs from occurring in a Swiping structure like (44a).[20]

Hartman argues that the focus feature on the preposition represents information focus (in the sense that it marks discourse-new information), not contrastive focus (in the sense of Gengel 2006). One piece of evidence he adduces in support of this claim is that "Swiping is only possible with *informationally focused* PPs, not *contrastively focused* ones" (Hartman 2007:33, fn. 6):[21]

(46) (a) ???/*The senator voted FOR the tax cut, but I don't know what AGAINST.
      (b) ???/*The senator voted AGAINST the tax cut, but I don't know what FOR (ibid.).

Rather like van Craenenbroeck (2004, 2010), Hartman posits that the whole PP headed by the focused preposition moves to Spec-FocP, and then the wh-constituent is subextracted out of the PP and moves to Spec-ForceP, leaving the preposition stranded in Spec-FocP (an analysis which will give rise to the same CED, Freezing and Criterial Freezing violations as van Craenenbroek's analysis: see Sect. 3.1.). By contrast, our analysis (which assumes that the focused preposition moves to Foc^o, and the interrogative wh-constituent moves to Spec-ForceP) avoids these pitfalls.

5.2 Material following a Swiped preposition

An anonymous reviewer notes that our analysis predicts that there should be no material in the embedded clause following the Swiped preposition, because the FinP constituent following the focused preposition is deleted. However, the reviewer suggests that this claim is potentially called into question by sentences such as:

(47) (a) I'm definitely buying Megaman, but am not sure *what system for* **yet**. (= 11b)
      (b) They were arguing, but I'm not sure *what about* **exactly**.
      (c) Ivy was talking, but I can't remember *who to* **about what**. (Larson 2013:15, (35))

This is because the Swiped preposition is followed by *yet* in (47a), *exactly* in (47b), and *about what* in (47c). Let's look at each of these three rather different cases in turn.

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[20]The editor notes that constituents that are non-D-linked can sometimes be focused. For instance, the negative polarity item *any* can readily be focused, both prosodically and informationally, in a context such as the following:

(i) SPEAKER A: What have you done all day? SPEAKER B: I haven't done ANYTHING all day.

[21]However, it seems to us that the preposition can receive contrastive as well as information focus in an appropriate context, e.g.

(i) We know Bond sent the package and we know *where* FROM, but we don't know *where* TO.

In (47a), *yet* modifies the matrix clause, as we see from the fact that (47a) is paraphraseable as 'I'm not *yet* sure what system for', and from the ungrammaticality of *'What system are you buying it for yet?'. Consequently, *yet* in (47a) occupies the same final position within the matrix clause (and outside the bracketed embedded clause) as it would in a non-elliptical structure such as, 'I'm not sure [what system I'm buying it for] yet'. Accordingly, (47a) poses no problem for our analysis.

As for (47b), Merchant (2002) argues that the adverb *exactly* has the property that it can modify a preceding XP/maximal projection but not a preceding X^o/head, so accounting for contrasts like:

(48) (a) *Which **exactly** train did they take?
      (b) *Which train* **exactly** did they take?

Significantly, however, *exactly* can also modify an interrogative CP/ForceP like those italicised below:

(49) (a) *What were they arguing about* **exactly**?
      (b) I've no idea *what they were arguing about* **exactly.**

Consequently, in (47b) it is plausible to conclude that *exactly* modifies a preceding CP/ForceP, albeit one whose FinP has been elided by Sluicing.

Potentially more problematic for our analysis are sentences like (47c). Although there is disagreement about the acceptability of such *multiple Swiping* structures in the literature, for present purposes, let us assume that they are indeed grammatical.[22] The issue raised by sentences like (46c) for our analysis is that if *about what* is contained within FinP, our analysis predicts that such sentences should be ungrammatical, because the whole of FinP is Sluiced. It is therefore clear that under our analysis, the PP *about what* must be positioned somewhere outside FinP in order to survive Sluicing of FinP. But where?

Lasnik (2013) discusses how to deal with potentially similar multiple Sluicing structures like that italicised below:

(50) ?One of the students spoke to one of the professors, but I don't know *which to which*. (Lasnik 2013:4)

Lasnik presents a critical review of earlier work and notes that multiple Swiping is subject to two constraints. One (noted by Takahashi 1994:285 and Merchant 2001:113) is a clausemate condition to the effect it is only possible where all the wh-constituents are contained in the same clause. If they are in separate clauses, ungrammaticality results—as in (51):

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[22]We use the term *multiple Sluicing/Swiping* to denote a sluiced/swiped clause containing multiple wh-remnants. Richards (1997:167) treats sentences like (46c) as grammatical. Merchant (2002:315; fn. 13) takes them to be ungrammatical. van Craenenbroeck (2004:27; fn. 31) reports in relation to four native speakers who judged a similar sentence that "two found it perfect, one gave it one question mark, one gave it two question marks." Lasnik (2013) reports that an anonymous reviewer who ran a small acceptability experiment on multiple Sluicing found the mean rating to be 3.2 on a 5-point scale where 1 denotes 'completely well formed' and 5 'completely ill formed'. Lasnik himself ran a parallel experiment on multiple Sluicing using the same scale and found that the mean rating for his subjects was 2.3.

(51)   *One of the students said that Mary spoke to one of the professors, but I don't know *which student to which professor*. (Lasnik 2013:6)

The second is that it is only possible where the second wh-constituent is a PP, as illustrated by the contrast below:

(52)   (a) ?Mary showed something to someone, but I don't know exactly *what to whom*.
        (b) ?*Mary showed someone something, but I don't know exactly *who what*. (Lasnik 2013:8)

Lasnik argues that these two conditions are parallel to conditions on Extraposition. Thus, for example, a PP but not a DP can be extraposed across an intervening adverbial like *yesterday*:

(53)   (a)   Some students met yesterday *with some professors*.
        (b)   *Some students met yesterday *some professors*. (Lasnik 2013:8)

Moreover, Extraposition is clause-bound in the sense that an extraposed PP cannot move out of its own clause into a higher clause (a condition dating back to the Upward Bounding Constraint of Ross 1986:179 whereby any operation in which "A is to be adjoined to the right of Y is upward bounded"):

(54)   *Some students said that Mary will speak yesterday *to some professors*.

Lasnik concludes from such examples that "the second *wh*-phrase in these multiple constructions has actually undergone extraposition, rather than *wh*-movement."

Lasnik's Extraposition analysis can be extended from Sluicing structures containing multiple wh-constituents to parallel Swiping structures like (46c) 'Ivy was talking, but I can't remember *who to about what*'. It can be accommodated within our analysis if the PP *about what* undergoes Extraposition and is adjoined to the right of some peripheral projection above FinP; as a result, the extraposed wh-PP survives ellipsis when FinP undergoes Sluicing in the PF component. Thus, sentences like (47c) can be accommodated within our analysis if we take the second wh-PP to have undergone Extraposition.[23]

However, the Extraposition analysis seemingly runs into problems in respect of long distance multiple Sluicing clauses like that italicised in (55a), and corresponding Swiping clauses like that italicised in (55b):

(55)   (a)   Fred thinks a certain boy talked to a certain girl. I wish I could remember *which boy to what girl*. (Lasnik 2013:12)
        (b)   Fred claimed that she had been arguing. I wish I could remember *who with about what*.

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[23] As an anonymous reviewer points out, there are potential parallels between the Extraposition analysis and earlier work claiming that in cases of Swiping even the first wh-PP undergoes rightward PP-movement followed by leftward movement of the complement of the preposition. See Kim (1997), Hasegawa (2006), Nakao et al. (2006), Nakao and Yoshida (2007) and Nakao (2009) for analyses of this ilk.

If the italicised clauses in (55) involve long-distance wh-movement, both wh-phrases will originate within the embedded clause but end up in the matrix clause, and the elliptical clauses italicised in (55) will derive from initial structures paraphraseable as:

(56) (a) Fred thinks [*which boy* talked **to what girl**]
      (b) Fred claimed [that she had been arguing *with who* **about what**]

The italicised wh-constituent will then move out of the bracketed embedded clause to the edge of the matrix clause, while the bold-printed wh-PP will undergo Extraposition and thereby move out of the embedded clause to adjoin to a peripheral projection above the matrix FinP. But this means that the bold-printed PPs undergo *long-distance* Extraposition, in violation of the Upward Bounding Constraint/UBC (Ross 1986:179). However, if locality conditions are PF-interface conditions and UBC specifies that a right-adjoined constituent can only locally bind a trace at the foot of a movement chain, Sluicing of the matrix FinP will delete any trace(s) of the extraposed PP at PF, and thereby obviate a potential UBC violation and ensure PF-convergence. (See below for an alternative account.)

A related question raised by the long Extraposition analysis is why long-distance Swiping leads to ungrammaticality in multiple Swiping clauses like that italicised below:

(57) *He said that he had been stabbed, but I can't remember *who to with what*.

Here, the instrumental PP *with what* originates as a constituent of the *stabbed* clause, and the PP *to who* as a constituent of the *said*-clause. The PP *with what* moves to a criterial position above FinP in the matrix clause, and thus survives Sluicing of the matrix FinP. Since the traces of the extraposed constituent are deleted when FinP is deleted, there is no violation of the locality condition on Extraposition. So why is the resulting sentence (57) ungrammatical?

The answer is that a sentence like (57) violates the condition that all the different wh-constituents in cases of multiple Sluicing/Swiping must be clausemates. This condition in turn can be argued to follow from the phase-based account of linearization developed in Fox and Pesetsky (2003, 2005) and Drummond et al. (2010). On this view, the constituents within a given phase are linearized when the phase undergoes spellout in the PF component. When two wh-constituents are not phasemates, they are not ordered directly, but rather indirectly via linearization of other constituents in intervening phases. Ellipsis deletes linearization statements (Fox and Pesetsky 2003:25(59b)), and consequently it follows that if two wh-constituents are contained in separate phases, deletion of the links connecting them will mean that phonology will unable to linearize them (Fox and Pesetsky 2003:27) and the derivation will crash at PF. Consequently, only wh-constituents which are phasemates can be linearized in cases of multiple Sluicing or multiple Swiping—and this phasemate condition is met in (55b) but not in (57). It may be (as the editor suggests) that a similar phase-based linearization account can be developed of how Sluicing repairs the UBC violation which would otherwise be incurred by long Extraposition in sentences like (54). If the long-extraposed PP moves first to Spec-CP, movement to Spec-CP gets the moved constituent linearized to the left of the other material in CP; subsequent extraposition

would get it linearized to the right of this material. The resulting linearization conflict is resolved by deletion of the embedded CP under Sluicing of the matrix FinP constituent.

Although our concern here is with Swiping in English, an anonymous reviewer raises the issue of how to deal with Swiping in a type of structure termed *Spading* in elliptical clauses like the following in Frisian:

(58)   Wer   dat oer?
           where that about
           'What about?'

Van Craenenbroeck (2010) argues that sentences like (58) are reduced clefts and that *dat* is a focused demonstrative pronoun, positioned on the edge of a focus-marking CP. If the preposition *oer* is adjoined to the head of this projection (as in our analysis of English Swiping) and *dat* is on the edge of the same projection, this will lead to a violation of the Doubly Filled COMP filter, the referee observes. While we will not attempt to deal with such sentences here, we note that van Craenenbroeck (2004:44) claims that "Frisian is an obligatorily doubly filled COMP filter violating language." If so, Spading in (58) would potentially be compatible with the analysis of Swiping proposed here, provided we assume parameterisation of the Doubly Filled COMP filter.

5.3 Licensing Sluicing

An anonymous reviewer points out that our analysis of potential cases of long-distance Swiping in a structure like (40) is incompatible with Aelbrecht's (2009, 2010) account of how Sluicing is licensed. As noted earlier, Aelbrecht claims that only an *interrogative* Force head licenses Sluicing, and yet our analysis of long-distance Swiping assumes that a declarative Force head (heading a ForceP which is the complement of the verb *predict*) licenses Sluicing in (40). The reviewer notes that the assumption that a declarative Force head can license Sluicing wrongly predicts that Sluicing should be possible in a declarative clause like that italicised below:

(59)   SPEAKER A: Did you open the present?
           SPEAKER B: *Yes, *a knife with*.

We cannot overcome this problem by positing that it is the interrogative Force head in the matrix clause which licenses Swiping of FinP in the embedded clause in (40), since Aelbrecht (2009:158) argues that licensing obeys the Phase Impenetrability Condition and is phase-internal: thus, only the embedded Force head can license ellipsis of the embedded FinP in (40). However, we can overcome this problem by making a minor revision to Aelbrecht's licensing condition and supposing that Sluicing is licensed in English by a Force head with a whQ feature requiring it to have a questioned wh-constituent as its specifier.[24] If a root Force head can only carry a

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[24]We draw the traditional distinction between yes-no questions and wh-questions, and suppose that a Force head with a whQ feature licenses only a wh-question operator (and not a yes-no question operator) as its

whQ feature in an interrogative clause and not in a declarative clause (but an embedded Force head can carry a whQ feature allowing a wh-interrogative projection to transit through it in a declarative clause), we can attribute the ungrammaticality of (59B) to the fact that it is a sluiced root declarative clause and hence its Force head cannot carry a whQ feature and therefore cannot license Sluicing. By contrast the situation is different in (40), repeated in slightly expanded form below:

(60)   [$_{ForceP}$ *how much* [$_{Force}$ ø] [$_{TP}$ it is predicting [$_{ForceP}$ ~~how much~~ [$_{Force}$ ø] [$_{FocP}$ [$_{Foc}$ by] [$_{FinP}$ e]]]]]

Here, Force^o in the embedded clause is declarative, as we see from the fact that it can be spelled out as *that* in the echo question paraphrase 'It is predicting *that* the Socialists will win by how much?' However, the embedded Force^o carries a whQ feature attracting *how much* to become its specifier, and this allows it to license Sluicing of the FinP *they will win* (because Force^o is the lowest head in the ForceP phase, and has a whQ feature and hence a wh-interrogative specifier). Given our assumption that only a Force head with a whQ feature licenses Sluicing of FinP, we can account for why Sluicing is not licensed by a yes-no complementiser like *whether/if* in embedded questions like, *'I think she has left, but I'm not entirely sure whether/if ~~she has left~~'.[25] We can also account for why Sluicing is not licensed by a relative clause complementiser, since C in a relative clause has (an R-feature requiring it to

specifier. There are clear semantic differences between the two types of question: a yes-no question asks for the truth-value of a proposition, whereas a wh-question asks for the identity of some entity. We leave open the possibility that the wh-Q feature may be reducible to two distinct features, a wh-feature and a Q-feature: see Cable (2010) on the Q-feature.

[25]The editor suggests that contrasts like that between (i) and (ii) suggest that although *if* can plausibly be analyzed as a complementiser which can head a finite (but not an infinitival) CP, *whether* is more plausibly taken to be a wh-word which (like *when*) can occur as the specifier of a finite or infinitival CP:

(i)   I wonder [*whether/when/if* I should leave]
(ii)   I wonder [*whether/when/*if* to leave]

However, we Googled dozens of authentic examples of *if* used in infinitival yes-no questions, including:

(iii)   Not sure *if* to start on a hormonal birth control? (*answers.yahoo.com*)

And the Spanish counterpart of English *si* 'if' likewise occurs not only in finite clauses but also in infinitives like:

(iv)   Me planteo *si* invitarla a cenar.
        'I'm considering if to invite her to dinner.' (Ángel Jiménez-Fernández, p.c.)

We conclude from examples like (iii, iv) that some complementisers are able to head both finite and infinitival CPs, and that *whether* is one of these. Moreover, there are independent reasons for treating *whether* as a complementiser, including the following. Unlike wh-words (but like the complementiser *if*), *whether* does not occur in root questions like (v), it cannot undergo wh-movement and so cannot be interpreted as extracted out of the bracketed embedded clause in sentences like (vi), it cannot occur in multiple wh-questions like (vii), it cannot be post-modified by *exactly* in sentences like (viii), it does not allow auxiliary inversion in Belfast English sentences like (ix), nor can it be followed by the complementiser *that* in Belfast English sentences like (x):

(v)   *When/*__Whether__ are you leaving?
(vi)   I wonder *how/__whether__ he thinks [she fixed it]

have) a relative specifier, not (a whQ-feature requiring it to have) an wh-interrogative specifier.

A second anonymous reviewer raises the objection that a declarative Force head in an embedded clause does not generally license Sluicing even if an interrogative pronoun transits through it. However, the empirical basis of this claim is undermined by sentences like those italicised below:

(61) (a) SPEAKER A: Where is he going?
           SPEAKER B: *Where do you think* ~~he is going~~?
      (b) The chef told us we should put salt in the soup, but I can't remember *how much he said* ~~we should put in the soup~~.

Such structures can be handled straightforwardly under our analysis, as we can illustrate in relation to (61b). The ellipsed embedded clause is declarative in force, as we see from the fact that it can be paraphrased as a *that*-clause in an echo question like, 'He said *that* we should put how much in the soup?' Since a declarative Force° in an embedded clause can carry a whQ feature (allowing an interrogative constituent to transit through its specifier position), the declarative Force° in the embedded clause has a whQ feature attracting *how much* to become its specifier. Since a Force° with a whQ feature can license Sluicing of FinP, the embedded FinP constituent marked by strikethrough can undergo Sluicing. Subsequently, the wh-phrase *how much* moves to the front of the *said* clause, so deriving the structure associated with (61b).

Although we have argued that only a head with a whQ feature (hence a wh-interrogative specifier) can license Sluicing in English, we note that van Craenenbroeck and Lipták (2006) argue that relative clauses can indeed license Sluicing in Hungarian, and propose a *Wh-Sluicing Correlation* to account for the relevant cross-linguistic variation (van Craenenbroeck and Lipták 2006:257(23)). This might make us wonder whether it is indeed the case that only heads with interrogative specifiers license Sluicing (and hence Swiping) in English. The answer depends on the acceptability and derivation of elliptical clauses like those bracketed below (where % indicates that there is inter-speaker variation with respect to their acceptability):

(62) (a) %Whenever we argue and [*whatever* **about**], we always make up afterwards.
      (b) %I'm amazed at how much he bought on eBay and [*how little* **for**]!
      (c) %The fewer presents we send and [*the fewer people* **to**], the happier Scrooge will be.
      (d) %So hard has he trained and [*so long* **for**] that he is sure to win the race.
      (e) %I'm going away, but [*not long* **for**].

The bracketed elliptical clause is a wh-unconditional (in the terminology of Rawlins 2008) in (62a), a wh-exclamative in (62b), a comparative correlative in (62c), a degree

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(vii)   I wonder *when*/****whether** who said what

(viii) I'm not sure *why exactly*/∗**whether** *exactly* he is leaving

(ix)   John asked Mary *why*/****whether** *was* she going to the lecture. (Adapted from Henry 1995:107)

(x)   I don't know *when*/****whether** *that* he is going. (Haegeman and Guéron 1999:283)

clause in (62d), and a negative clause in (62e). Since Swiping is generally taken to occur only in interrogative clauses in English and since the clauses bracketed in (62) are not interrogative, we will refer to them as instances of *Pseudoswiping*.[26] Interesting questions arise not only about the derivation of Pseudoswiping, but also about different acceptability judgments given by different informants for such structures. We asked 20 experienced linguists (identified in the *Acknowledgements*) to judge the acceptability of the sentences in (62), using a 5-point acceptability scale on which they were asked to rate each sentence as *OK*, or ?, or ??, or ?*, or *. We then calculated the percentage of respondents who rated each sentence as *relatively acceptable* (viz. as either *OK* or ?). This resulted in acceptability scores of 85 % (17/20) for the wh-unconditional (62a); 55 % (11/20) for the wh-exclamative (62b); 40 % (8/20) for the comparative correlative (62c); 40 % (8/20) for the degree clause (62d); and 5 % (1/20) for the negative clause (62e). As a cross-check, Philip Hofmeister kindly included the sentences in (62) in a larger Mechanical Turk study involving 64 participants (all from the US), with participants being asked to rate sentences on a 7-point numerical scale (on which 1 denotes 'extremely unnatural' and 7 denotes 'extremely natural'). The mean ratings for each sentence were 4.95 (0.20) for the wh-unconditional (62a); 4.50 (0.22) for the wh-exclamative (62b); 3.92 (0.20) for the comparative correlative (62c); 2.69 (0.20) for the degree clause (62d); and 4.27 (0.29) for the negative clause (62e). By comparison, the interrogative Swiping structure *I wonder where she bought that awful tie, and who for* achieved a mean score on the Mechanical Turk experiment of 5.13 (0.20). Clearly, the nature of Pseudoswiping and its relation to Swiping merit further investigation, but we leave this as a topic for future research.

5.4 Long-distance Swiping

Our analysis in Sect. 4.7 suggests that Swiping can apply across a potentially unbounded domain, giving rise to the two types of long-distance Swiping structure in (39a, b); and indeed Hartman (2007:57) likewise proposes a long-distance account (albeit differing in details). However, the status of long-distance Swiping is potentially problematic from both a theoretical and an empirical standpoint. From a theoretical perspective, a challenge comes from the observation that Swiping involves a type of Sluicing termed *Sprouting* (defined as "the subtype of Sluicing in which the remnant of ellipsis has no overt correlate in the antecedent clause" by Chung et al. 2011:31) and more specifically by the claim made by Nakao (2009:72, citing unpublished work by Lasnik 2002) that Sprouting does not license long-distance ellipsis, e.g. of the material marked by strikethrough in:[27]

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[26]It should be noted, however, that wh-unconditionals (or *exhaustive conditionals* as they term them) are treated as a subtype of interrogative by Huddleston and Pullum (2002:14.6), and by Borsley (2011:fn. 1). It should also be noted that Abels (2007) highlights important similarities between exclamatives and interrogatives.

[27]However, Chung et al. (1995:279) make the very different claim that a Sprouting/Swiping structure like the *but*-clause in (i) permits a long-distance reading paraphraseable as (ii):

    (i)   I think Agnes said that Bill would speak, but I don't remember *what about*.

    (ii)   but I don't remember *what Agnes said that Bill would speak about*.

(63)   *She denied that John ate, but I don't know what ~~she denied that John ate~~.

As for apparent cases of long-distance Swiping like (39a), it has been suggested (e.g. by Hasegawa 2006:439; fn. 4) that the string intervening between the wh-constituent and the preposition is "some sort of parenthetical element"—a suggestion echoed in Larson (2013:9; fn. 5). And in relation to structures like (39b), it has been suggested by Merchant (1999, 2001) that the interpretive properties of the structure can be handled by positing a mono-clausal source containing a modal (see below).

An anonymous reviewer gives several reasons for doubting the existence of long-distance Swiping. One is that our analysis posits that Swiping can be licensed by a declarative Force head in sentences like (39a), so (supposedly) wrongly predicting that sentences like (59B) are grammatical. However, since we dealt with this issue in the previous section, we shall say no more about it here.

A second reason given by the reviewer is that the long-distance Swiping analysis we sketched in Sect. 4.6 predicts that (39a) and (39b) should differ in the scope of the focused P, since this is in the embedded FocP in (39a) and (40) but in the matrix FocP in (39b) and (41), and yet it is hard to discern any scope difference. However, such an outcome is only to be expected, given that prepositions (unlike e.g. quantifiers) are not scope-bearing elements. Consequently, it is equally hard to discern a scope difference in cases of matrix and embedded focusing of an italicised PP in sentences like:

(64)   (a)   *At the end of next season*, pundits are predicting [that the club will be relegated]
        (b)   Pundits are predicting [that *at the end of next season*, the club will be relegated]

This weakens the force of the *scope* argument.

A third reason given by the reviewer is that there are severe lexical restrictions on the choice of strings which can intervene between wh-constituent and preposition in structures like (39a): the reviewer notes that "all of them either feel parenthetical-like or repeat material from the antecedent clause" (e.g. the string *it is predicting* in (39a) repeats the subject, auxiliary and verb from the string *a recent poll is predicting* in the matrix clause). However, examples such as those below suggest that it is not necessary for material intervening between the wh-constituent and preposition (like that underlined below) to be a repetition of material in the matrix clause:

(65)   (a)   You'll never believe it! She told me she's getting married again. And *who do you think she said to*?!
        (b)   You said your house was burgled. Have you any idea *who the Police think by?*
        (c)   It is widely expected the Socialists will win but I'm not sure *how much the polls are predicting by*.

Similarly, Sprouting in (iii) allows a long-distance reading whereby the parenthesised material is elided:

    (iii)   I know he said we should wait, but I can't remember *how long* (*he said* (*we should wait*)).

    (d) He admitted he was having an affair. You'll never guess *who my neighbours think he said with*.

Nonetheless, there do indeed appear to be constraints on the types of predicate which license Swiping, as we see from the observation that the bold-printed predicates below do not allow a Swiped preposition complement:

(66)   (a) *He knows his wife is having an affair, but I'm not sure [who he **knows** *with*]

        (b) *They demanded that the suspect be charged, but I don't know [what they **demanded** *with*]

        (c) *I know he wanted to kill her, but I don't know [what he **wanted** *with*]

If sentence fragments involve fronting the fragment to focus it and then deleting the clausal remnant (Merchant 2004; İnce 2012), it may be that there is a correlation with the set of predicates that allow a sentence fragment (like that italicised below) as their complement: cf.

(67)   They asked who it should be given to, and I **said/**demanded** *me*.

It may be that factive, subjunctive and control complements like those bracketed in (65a–c) respectively have complements which project a defective peripheral structure, and lack the ForceP projection crucial to licensing ellipsis—as argued by Haegeman (2003, 2006) and Yoshimoto (2012).

    Support for the long-distance analysis comes from *bridge* effects. Ross (1986:154) notes that there are a class of non-bridge verbs in English (like *quip* and *snort*) which do not allow extraction out of their complement:

(68)   *Who did Mike snort that Melissa would never get engaged to?

Such verbs do not allow a Swiped preposition to be stranded in their complement:

(69)   *Mike snorted that Melissa had got engaged, but I can't remember *who he snorted to*.

This behaviour is precisely as expected under a long-distance Swiping account, if the complement of a non-bridge verb does not allow a wh-constituent to transit through it.[28]

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[28]Although we lack space to discuss this issue here, we note that some researchers (e.g. Merchant 2001; Nakao 2009; Lasnik 2013) have attempted to derive cases of long-distance Sluicing from a monoclausal source. For example, Lasnik (2013) proposes that the sluiced clause italicised in (i) has the monoclausal source bracketed in (ii) rather than the biclausal source bracketed in (iii):

    (i)   Fred thinks a certain boy talked to a certain girl. I wish I could remember *which boy to what girl*.

    (ii)   I wish I could remember [which boy talked to what girl]

    (iii) I wish I could remember [which boy Fred thinks [talked to what girl]]

However, Lasnik (2013:12) concedes that the monoclausal analysis in (ii) poses the interpretive problem that "It was never actually asserted that a boy talked to a girl, merely that Fred thinks that it happened." He

5.5 Sluicing and repair

A key assumption made in our analysis is that Sluicing repairs elicit extraction out of PP, and this invites the question (raised by an anonymous reviewer) of whether there are other types of structure in which ellipsis repairs illicit extraction out of PP. Collins and Radford (2013) present extensive evidence from a corpus of live, unscripted radio and TV broadcasts that speakers sometimes 'ghost' (i.e. delete) prepositions in (non-standard) structures such as the following (where angle brackets mark the ghosted preposition):

(70)   Manchester United have got a good goalkeeper, [**which** Torres could've had a goal <*without*>] (Peter Allen, BBC Radio 5)

In structures like (70), the Adjunct Island violation induced by illicitly extracting *which* out the adjunct PP headed by *without* is repaired by deleting the relevant PP (containing *without* and a trace of *which*) at PF. If so, this suggests that (in colloquial English), Ghosting (in the sense of Collins and Postal 2012) can be used to repair illicit extraction out of PP.

A potential empirical challenge to our *repair* account of Sluicing being required in cases of Swiping in order to delete illicit traces left behind at PF comes from clauses like those italicised below:

(71)   (a)   Wherever from, he asked his heart, *where from did you get this happiness*? (Herman Hesse. 2008. *Siddharta*: *An Indian tale*, Forgotten Books, p. 85; http://books.google.co.jp/books?id=Wgosk7rR3h8C&dq =%22where+from+did+you+get+this+happiness%3F%22&hl=ja& source=gbs_navlinks_s)
         (b)   They want to rush back to *wherever from they had come*. (Raj Gill. 1990. *Ripples*. B.R. Pub. Corp., p. 79)
         (c)   At the same time, regarding enforcing our ban, we do take up the matter with the State Governments *wherever from we hear that the ban is not being followed in totality*. (India Parliament. Rajya Sabha. 1996. *Parliamentary debates: official report*, 178: 27∼28. Council of States Secretariat, p. xv.)
         (d)   Our foreign exchange sources are already strained and therefore there is no choice but to borrow, *wherever from we can*. (Adarsh Seva Sangha. 1973. *Rural India* 36: 319∼326. R.G. Gupta, p. 98)

At first sight, they might seem to involve Swiping without Sluicing, with for instance the Swiped string *where from* being followed by the unsluiced FinP *did you get this happiness* in (71a). If so, they would clearly undermine our claim that Sluicing is obligatorily required in cases of Swiping in order to delete illicit traces at PF.

However, WH+P-fronting structures like (71) have two notable characteristics. Firstly, they are restricted to occurring with the *r*-word *where*(*ver*); and secondly,

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suggests (ibid.) that this can be handled in terms of "a sort of accommodation" but offers no clarification of what kind of interpretive mechanism *accommodation* might be.

they have a distinctly regional feel to them (a Google search suggesting that they are instances of Indian English). This leads us to suspect that they are relics of a structure once productive in earlier varieties of English. In order to test this, Susan Pintzuk kindly searched 3 corpora for us, covering the earliest stages of Old English through Early Modern English: the York-Toronto-Helsinki *Parsed Corpus of Old English* (Taylor et al. 2003), the Penn-Helsinki *Parsed Corpus of Middle English* (Kroch and Taylor 2000) and the *Parsed Corpus of Early English Correspondence* (Taylor et al. 2006). She reports that WH+P-fronting structures were restricted to occurring with *r*-words (*where, here, there*) and that they occurred in a full range of wh-clauses, including direct and indirect questions, relative clauses and free relatives.[29] 3,672 of the 3,688 WH+P-fronting structures in the corpora (99.6 %) were unsluiced, while 16 (0.4 %) were sluiced. Since there was no material intervening between the *r*-word and the preposition, since the fronted constituent was always a word and never a phrase, and since the *r*-word and preposition were generally (in 3,582 of 3,688 cases, i.e. 97.1 %) written as a single word, it seems reasonable to hypothesize that WH+P-fronting involved head-adjunction—i.e. adjunction of an *r*-word to a preposition. If so, the *r*-word would be prevented from undergoing subsequent movement to Spec-CP on its own by two constraints: on the one hand, a constraint against Excorporation (Roberts 1991, 2010) would prevent the wh-word from being excorporated out of the head preposition it had adjoined to; and on the other hand, the Chain Uniformity Constraint would prevent the wh-word from moving on its own into Spec-CP, since this would result in an illicit non-uniform wh-chain whose head was a maximal projection and whose foot was a minimal projection. There is clearly much more to be said about the history of R-Movement, but we leave this as a topic for future research. For present purposes, what is important to note is that if archaic structures like (71) are cases of R-Movement, they are not instances of (or counterexamples to our analysis of) Swiping.

Nonetheless (as an anonymous reviewer observes), it could be objected that our assumption that Sluicing repairs illicit traces left behind at PF by Swiping poses the following theoretical problem. As we noted earlier, Swiping involves a type of Sluicing termed *Sprouting*. Chung et al. (2011) argue that Sprouting is unable to repair island violations (a generalization which they attribute to Chris Albert), and the following example they give (Chung et al. 2011:37, (13a)) suggests that the same is true of Swiping, since the italicised Swiped clause in (72a) gives rise to the same constraint violation as its unsluiced counterpart (72b):

(72) (a) *Sandy was trying to work out which students would speak, but she refused to say *who to*.
      (b) who she was trying to work out which students would speak to.

Thus, our claim that Swiping repairs PF constraints would appear (at first sight) to be inconsistent with Albert's Generalisation.

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[29]There was only one fronted WH+P structure not involving *where*, involving an instance of *whifor* in the PPCME, perhaps the result of scribal confusion with *wherefor* (which could have much the same sense).

To see why, let us take a closer look at the derivation of the italicised Swiped clause in (72a). On our assumptions, this will have the superficial syntactic structure shown in highly simplified form below:[30]

(73)   [$_{ForceP}$ who [$_{FocP}$ to [$_{FinP}$ <s>to who</s> [$_{TP}$ she was trying to work out [$_{ForceP}$ [$_{PP}$ <s>to who</s>] which students [$_{TP}$ <s>which students</s> would speak <s>to who</s>]]]]]]]

More specifically, *which students* will move to its criterial position as the specifier of the embedded ForceP. The PP *to who* will be forced (by the Phase Impenetrability Condition) to transit through the edge of the embedded ForceP before subsequently moving to the edge of the matrix FinP. The corresponding clause (72b) is ungrammatical without Swiping and Sluicing, because of violation of an Intervention Constraint barring movement of one interrogative quantifier across another—a condition which Starke (2001:6(9)) formulates in representational terms as follows (where $<Q_1>$ is a null copy of Q_1, and the quantifiers belong to the same semantic class):

(74)   *$Q_1 \ldots Q_2 \ldots <Q_1>$

An intervention violation is incurred in (73) because the *which*-DP intervenes between two copies of the *who*-PP in the embedded clause. However, subsequent Sluicing of the matrix FinP in (73) will delete the embedded ForceP containing the intervention violation, and so our analysis would seemingly wrongly predict that the Swiped clause in (72a) should be grammatical. Yet it clearly is not. How come? The answer (we suggest) is that the Intervention Constraint is an interface condition which holds at LF, not at PF. As such, it will apply to an LF representation generated from an unsluiced syntactic structure like (73) containing an intervention-violating ForceP, not from a PF structure in which FinP (and the intervention-violating ForceP which it contains) has been sluiced. More generally, it follows from our analysis that since Sluicing is a PF operation, it can repair structures which contain illicit traces at PF, but not structures which contain illicit traces at LF.

However, the same reviewer goes on to ask why violation of the Freezing/Edge conditions creates a problem at the PF interface, whereas violation of the Intervention Constraint leads to a problem at the LF interface. We argue that this follows from conceptual considerations relating to the nature of the two constraints. The Intervention Condition is sensitive to the semantic properties of the moved constituent and the intervener (e.g. properties such as specificity and quantification), and a constituent carrying a feature belonging to a given semantic class will be blocked from crossing any c-commanding constituent carrying a feature belonging to the same semantic class. Since the relevant semantic features are visible at LF but not at PF, this means that (if constraints are interface conditions, as argued by Chomsky 2005:1) the constraint must, as a matter of conceptual necessity, be an LF interface condition. There is also empirical evidence that this must be the case, from Swiped clauses like that italicised in (35a) above, with the PF structure in (35b):

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[30]Recall from Sect. 4.1 that Force and Finiteness are expressed as a single head, except where some other projection intervenes, or where FinP undergoes Sluicing. Consequently, Force and Fin will be syncretised in the embedded clause in (73), but not in the matrix clause.

(35)   (a)   *He's given away his possessions including his Rolls Royce, but I'm
              not sure [*who the Rolls* **to**]

        (b)   [$_{ForceP}$ *who* [$_{Force}$ ø] [$_{TopP}$ *the Rolls* [$_{Top}$ ø] [$_{FocP}$ [$_{Foc}$ **to**+ø] *e*]]]

We noted earlier that movement of the interrogative operator *who* across the fronted
argument and specific DP *the Rolls* induces an intervention effect. However, Sluicing
of FinP in (35b) erases all traces of the (italicised and underlined) moved constituents
at PF, with the result that PF cannot 'see' that *who* has illicitly moved across *the Rolls*.
Thus, if the Intervention Constraint were a PF condition, structures like (35b) would
wrongly be predicted to be grammatical. But if (as we claim) the Intervention Con-
straint is an LF interface condition, all traces of moved constituents will be visible,
and LF can 'see' that *who* has illicitly crossed the specific DP *the Rolls*.

By contrast, the Edge and Freezing Conditions are purely structural locality con-
ditions on antecedent-trace relations which are 'blind' to the semantic properties
of the relevant constituents. Moreover, the Freezing Constraint has been argued
to be reducible to principles of linearization and spellout at PF (Uriagereka 1999;
Nunes and Uriagereka 2000; Sheehan 2010, 2013) and this means that as a matter of
conceptual necessity it must operate at the PF interface. The same conclusion holds
if (as argued by Hofmeister 2012), freezing violations create difficult-to-parse PF
structures containing nested dependencies in which a filler is associated with a gap
inside another filler associated with another gap: such considerations suggest that the
Freezing Condition is essentially a PF interface condition requiring PF structures to
be parseable.

6 Concluding remarks

This paper has been concerned with the syntax of Swiping in English, in sentences
like, 'She told me she was having an affair, so I asked *who with*'. In Sect. 2 we
outlined the properties of P-Swiping identified by Merchant, noting his claim that
Swiping involves an interrogative wh-word positioned in front of a focused prepo-
sition, and that the clause remnant following the preposition undergoes obligatory
Sluicing. In Sect. 3, we outlined the *CP shell* analysis developed by van Craenen-
broeck (2004, 2010), under which a PP containing a wh-word is moved into the spec-
ifier position of an inner CP, the wh-word is moved into the specifier position of an
outer CP (stranding the preposition on the edge of the inner CP), and the residual
TP is deleted at PF. We noted that his claim that only wh-words undergo Swiping
is called into question by attested cases of wh-phrase Swiping. We also noted that
the number of CP projections posited under a CP shell analysis would have to be
increased, with one additional CP required to house circumstantial adjuncts interven-
ing between wh-constituent and preposition, and another CP required to house the
inverted auxiliary that is Swiped in root questions. Since each of these CP projec-
tions has a different type of dedicated functional head licensing a different type of
constituent on the edge of its projection, we suggested that this approach could better
be accommodated within a cartographic framework which posits a richly articulated
clause structure (as in Rizzi 1997 and much subsequent work). In Sect. 4, we went on
to outline a cartographic analysis under which Swiped clauses contain ForceP, FocP,

and FinP projections. We argued that the wh-PP moves to the edge of FinP (with the auxiliary moving to Fin^o in structures involving auxiliary inversion), the preposition moves into Foc^o to mark it as focused, and the wh-QP moves to the edge of ForceP to type the clause as interrogative. FinP subsequently undergoes obligatory *Sluicing* in the PF component, in order to repair potential violations of PF locality constraints. In Sect. 5, we dealt with a number of issues arising from our analysis.

The cartographic analysis we outlined in Sect. 4 provides a principled account of nine key properties of Swiping. This first is that Sluicing is an obligatory component of Swiping: this is because Sluicing serves to repair violations of PF locality constraints which would otherwise arise (though it cannot repair LF violations). The second is that Swiping in root clauses never strands an inverted auxiliary (i.e. never gives rise to structures like, *What about were they talking?*): this is because Swiping involves Sluicing of FinP rather than TP, and FinP houses inverted auxiliaries. The third is that Swiping is permitted with wh-phrases, not just with wh-words: this follows because Swiping under our analysis involves wh-movement through Spec-FinP to Spec-ForceP, and specifiers house maximal projections. The fourth is that the Swiped preposition is stressed, and cannot be given; this follows from it being focused by being adjoined to Foc^o. The fifth is that Swiping does not allow phrasal material to be focused: this is because focusing phrasal material would incur an unrepairable Criterial Freezing violation. The sixth is that local in situ adverbials (but not fronted arguments) can intervene between the wh-constituent and its governing preposition: this is because the latter (but not the former) give rise to LF intervention effects. The seventh is that Swiped prepositions do not allow a specifier like *straight*: this is because *straight* would end up stranded on the edge of FinP, and would be deleted by FinP Sluicing. The eighth is that varieties of English (like Belfast English) which allow *wh + that* structures require *that* to be deleted in cases of Swiping: this follows from our FinP deletion analysis of Sluicing if (as Baltin argues) *that* in such structures occupies the head Fin position of FinP. The ninth is that Swiping can be a long-distance operation in which the wh-constituent ends up on the edge of the matrix clause, and the focused preposition on the edge of the embedded clause.

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