

On the Syntax of Multiple Sluicing*

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1. Sluicing: Phenomenon and background assumptions

Sluicing is a form of clausal ellipsis first discussed in Ross 1969. Sluices have the syntactic distribution (Ross 1969, Levin 1982, Merchant 2001 and interpretation (Ross 1969, Culicover & Jackendoff 2005) of full *wh*-questions but are incomplete in that they consist only of a *wh*-phrase. The sluices in examples (1a-b) consist only of the word *what*:

- (1) a. I just did something really exciting, but I am not going to tell you what.
b. Joe is reading, but god only knows what.

It will be useful to settle some terminology before proceeding.

- (2) [John bought [a car]] but I don't know [[which one] ____]
[correlate] [remnant] ellipsis site
[antecedent] [sluice]

We will refer to *which one* as the remnant. The clause intuitively providing the meaning of the elliptical question, here *John bought a car*, will be called the antecedent. The indefinite, *a car*, whose identity is queried in sluicing will be called the correlate. The gap immediately following the remnant, where the remainder of the question would come in a canonical *wh*-question, will be called the ellipsis site, and the clausal structure containing remnant and ellipsis site form the sluice.¹ Examples (2) and (1a) have an indefinite correlate whose identity is queried by the sluice. This type of example is called merger type in Chung

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¹The distinction between remnant and sluice is important. The sluice is a clause (CP) while the remnant in (2) is a noun phrase.

et al. 1995. When there is no overt correlate in the antecedent, we speak of sprouting, (1b). When discussing theories of sluicing that assume the presence of unpronounced syntactic structure at the ellipsis site, we will use the term “pre-sluice” from Dayal & Schwarzschild (2010) to refer to the fully pronounced version of the sentence that gives rise to the sluice. A range of plausible pre-sluices for (2) is given in (3).

- (3) a. which car he bought
 b. which car it is

Ross (1969) not only discovered that sluices have the category, distribution, and interpretation of interrogative clauses, he also discovered two further properties of sluicing that have set the agenda for subsequent research on sluicing.

Ross (1969) noted that correlate and remnant must match in a number of properties. In particular, nominal remnants generally match in case with the antecedent (Ross (1969), Merchant (2001), Levin (1982), Vicente (under review), Jim Wood (2016), Abels (2017b)). We will refer to this observation as case connectivity.

Case connectivity was taken by Ross and many others as compelling evidence for two assumptions: the assumption that there is an unpronounced case assigner in the E-site and the further assumption that the case assigner in the E-site is identical to the case assigner in the antecedent. These two assumptions lead fairly naturally to a theory of sluicing where antecedent and E-site are syntactically identical and clausal ellipsis is preceded by extraction of the remnant from the E-site by *wh*-movement.

However, while the hypothesized *wh*-movement operation at the E-site shares many properties with regular *wh*-movement, it appears to be insensitive to syntactic islands. This is illustrated by (4), whose pre-sluice under Ross’ syntactic identity account of sluicing is (5). (5), of course, violates the complex NP constraint.

- (4) They want to hire someone who speaks a Balkan language, but I don’t know which (Balkan language).
 (5) *They want to hire someone who speaks a Balkan language, but I don’t know which Balkan language they want to hire someone who speaks.

Levin (1982), Ginzburg & Sag (2000), Culicover & Jackendoff (2005) take the apparent island insensitivity of sluicing to argue for the absence of syntactic structure at the E-site.

Proponents of syntactic identity accounts then face the difficulty of explaining why movement within the E-site is insensitive to island phenomena (see Hornstein et al. 2007, Müller 2011, Boeckx 2008) while proponents of accounts without syntactic structure at the E-site face the problem of explaining the case matching facts. The difficulties for both sides are compounded further by the observation that island insensitivity seems to be selective (Winkler 2013, Griffiths & Lipták 2014, Reinhart 1991, Fox & Lasnik 2003, Lasnik 2001, Barros 2014, Barros et al. 2014, Abels 2011, 2017a,b).

A particularly perplexing set of observations concerning locality comes from the phenomenon at the heart of this paper, multiple sluicing. Multiple sluicing describes elliptical

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questions with more than one *wh*-phrase as remnant. The phenomenon is found in languages which otherwise have *wh*-in-situ questions, (6), single *wh*-fronting, (7), and multiple *wh*-fronting, (8) (Merchant 2001).

- (6) Japanese (from Nishigauchi 1998, 121 ex. 1)
John-ga [dareka-ga nanika-o katta to] it-ta. Mary-wa [dare-ga
John-NOM someone-NOM something-ACC bought that said Mary-TOP who-NOM
nani-o ka] siri-tagat-te iru.
what-ACC Q know-want is
John said someone bought something. Mary wants to know who what.
- (7) German
Jeder Student hat ein Buch gelesen, aber ich weiss nicht mehr wer welches.
every student has a book read, but I know no longer who which
Every student read a book, but I can remember which student which book.
- (8) Slovenian (from Marušič & Žaucer 2013, 419 ex. 3a)
Vid je rekel, da je Rok predstavil nekomu nekoga, pa ne vem komu
Vid AUX said that AUX Rok introduce one.DAT one.ACC, but not know who.DAT
koga.
who.ACC
Vid said that Rok introduced someone to someone, but I don't know who to who.

In these languages, multiple sluicing obeys the following two generalizations:

- (9) a. All remnants in multiple sluicing must originate in the same (finite) clause.
b. The clause where remnants originate may be inside of an island.

Examples (6)–(8) are acceptable and all obey the clause-mate condition, (9a). The German examples in (10) show that multiple sluices may not violate the clause-mate condition, (10a), but that the remnants may originate in a clause inside of an island, (10b).

- (10) a. Fatal violation of the clause-mate condition:
*Vor jedem Vorfall hat ein Student behauptet, dass Maria mit einem
before each incident had a student claimed that Maria with a
Professor geredet hatte, aber ich weiss nicht welcher Student mit welchem
professor talked had but I know not which student with which
Professor
professor
Before each incident a student claimed that Maria had talked with a professor,
but I don't know which student with which professor.
- b. Unproblematic violation of the complex NP condition:

Ich kenne einen Lehrer, der jedem Kind ein Geschenk gegeben hat,
 I know a teacher who every.DAT child a.ACC present given has
 aber ich weiss nicht genau welchem Kind welches Geschenk.
 but I know not exactly which.DAT child which.ACC present.
 I know a teacher who gave a present to each child, but I can't remember
 which present to which child.

The clause-mate condition holds across a very broad range of languages. In addition to German, it applies in Japanese (see (Takahashi 1994, 285–287); Nishigauchi (1998); (Abe 2015, chapter 6), and below), and in Slovenian (Marušič & Žaucer 2013). It also holds in Dutch (A. Neeleman, p.c.), English (Lasnik 2014), Brazilian Portuguese (Rodrigues et al. 2009), Spanish (Rodrigues et al. 2009), Italian (E. Callegari, p.c., who argues in Callegari 2015 that Italian does allow multiple questions, contra Calabrese 1984, but only in embedded contexts), Lithuanian (Adliene 2014), Bangla (Bhattacharya & Simpson 2012), Hindi, Greek (E. Molimpakis, A. Vergou, C. Vlachos, p.c.), Czech (J. Kaspar, I. Kucerova, P. Caha, p.c.), Norwegian (Ø. Nilsen, p.c.), Polish (D. Grabska, M. Dedan, p.c.), Russian, Kîtharaka (P. Muriungi, p.c.), and Hungarian (K. Szendroi, B. Szendroi, p.c.). The clause-mate condition is the main fact to be explained in this paper.

A few caveats concerning the generalization are in order. Lasnik (2014) notes that in Serbo-Croatian the clause-mate condition fails to hold for just those of his informants for whom it also fails to hold under regular multiple *wh*-fronting. These speakers' judgments suggest that the clause-mate condition needs to be slightly refined to allow for overt multiple *wh*-movement to overcome the restriction.² Similarly, Bhattacharya & Simpson (2012, 194 fn. 9 ex. ii) observe that overt movement of the correlate can overcome the clause-mate restriction in Bangla, suggesting that a different form of long movement can overcome the clause-mate condition in Bangla.

Furthermore, Nishigauchi 1998, 133–34 ex. 34 noticed the following counterexample to the clause-mate condition in Japanese: If a quantifier in the matrix clause binds the subject in the embedded clause, resulting in the bound subject pronoun and the *wh*-phrase being clause-mates, then multiple sluicing becomes possible across clauses. This counterexample to the clause-mate condition is quite systematic. The pattern can be reproduced in other languages including English (below), German, Hungarian (K. Szendroi, p.c.), Norwegian (Ø. Nilsen, p.c.), Italian (N. Grillo, p.c.), and Czech (P. Caha, I. Kucerova, p.c.).

- (11) a. *Everybody claimed that Fred had talked to some professor, but I can't remember who to which professor.

²A similar claim for Kashmiri, a multiple *wh*-fronting language where non clause-mates are possible in multiple *wh*-questions, can be found in Manetta 2017. The example of multiple sluicing violating the clause-mate constraint provided by Manetta is somewhat dubious, however: Manetta claims that multiple questions in Kashmiri generally disallow single pair readings. However, the crucial multiple sluicing example violating the clause-mate constraint has a single-pair reading. The proper analysis of the example might therefore involve asyndetic coordination of two sluices rather than multiple sluicing.

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- b. Everybody_k claimed that they_k had talked to some professor, but I can't remember who to which professor.

Grano & Lasnik 2016, Barros & Frank 2017a,b, 2016 suggest that this type of example is part of a larger pattern, a pattern where the clause-boundedness of a variety of processes including, for example, quantifier raising is suspended under certain circumstances. Grano & Lasnik 2016 investigate the effect of a bound subject pronoun, while Barros & Frank 2017a,b, 2016 claim that the effect shows up under a much larger set of circumstances.³ Both sets of authors suggest that the difference between bound versus referentially independent subjects can be captured in terms of a shift in where a particular locality boundary (phase) falls, with the effect of allowing quantifier raising, multiple sluicing, etc., to overcome their usual clause boundedness. We will suggest below that additional *wh*-phrases in multiple sluicing reach their landing sites through a (covert outside of ellipsis contexts) movement which we call Pair List movement. The fact that its clause boundedness can be modulated in the same way we observe for quantifier raising is welcome indirect evidence for our independently motivated claim that Pair List movement is a real, covert movement operation (with properties quite similar to quantifier raising). For the sake of simplicity, we will continue to talk about the clause mate condition on multiple sluicing and the clause boundedness of Pair List movement with the understanding that both can be modulated by the factors discussed in Grano & Lasnik 2016, Barros & Frank 2017a,b, 2016.

We are aware of only one true counterexample to the clause-mate condition: Sato (Cam-CoS 5, May 06 2016) claims that in Indonesian multiple *wh*-phrases can be separated not only by clause boundaries but even by islands and that either or both of the *wh*-phrases can strand prepositions. We have no insight to offer on Indonesian.

The clause-mate condition cannot be reconciled with non syntactic approaches to sluicing. Under such accounts, sluicing is exempt from island effects, because there is no structure at the E-site. To interpret a sluice, a suitable interpretation must be found. No more, no less. In the case of multiple sluicing, this search should generally produce well-formed interpretations as single or pair list questions whether or not the remnants are clausemates. (12a) is a well-formed multiple question with a Pair List reading. The *wh*-phrases are separated by an island. The corresponding multiple sluice, (12b), is unacceptable; it violates the clause-mate condition.

- (12) Jeder dieser Philosophen wird sich ärgern, wenn wir einen bestimmten
Every these philosophers will self annoy if we one particular
Linguisten einladen, aber ich weiss nicht,
linguist invite but I know not
Every one of these philosophers will be annoyed if we invite a particular linguist
but I don't know

³Barros & Frank 2017a,b, 2016 observe that the approach to Nishigauchi's example in Abels & Dayal 2016 in terms of short paraphrases within the ellipsis site does not extend to all relevant cases.

- a. ... welcher Philosoph sich ärgern wird, wenn wir welchen Linguisten
 which philosopher self anger will if we which linguist
 einladen.
 invite
 ... which philosopher will be annoyed if we invite which linguist.
- b. *... welcher (Philosoph) welchen (Linguisten)
 which philosopher which linguist
 ... which (philosopher) which (linguist)

This problem for non syntactic approaches cannot, however, be turned into an argument for syntactic identity accounts. Syntactic identity accounts are based on the premise that, *ceteris paribus*, movement within the E-site is not subject to locality constraints. Such models therefore have little leeway to impose a clause-mate condition.

We follow instead the account of sluicing and island insensitivity in Merchant (2001) (see also Baker & Brame (1972), Barros (2014), Barros et al. (2014), Abels (2011, 2017b,a)). This account is based on the assumption that sluicing involves phonological ellipsis fed by *wh*-movement, that is, we assume that there is syntactic structure at the E-site. However, the identity condition on ellipsis is essentially semantic. Basically, the content of the E-site must entail and be entailed by the antecedent. Island violations can then be evaded by choosing appropriate paraphrases of the antecedent as pre-sluice at the E-site. Thus, the pre-sluice for (4) is not the ungrammatical (5) but rather one of the following:⁴

- (13) Possible pre-sluices for (4):
- a. ... which Balkan language they should speak.
 b. ... which Balkan language it is.

Similarly for the multiple sluicing examples above where the remnants originate inside of an island. We suggest that the pre-sluice for (10b) is (14).

- (14) ... welchem Kind er welches Geschenk gegeben hat
 which.DAT child he which.ACC present given has
 ... which present he gave to which child

The island evasion approach assumes that constraints on movement are operative at the E-site, an assumption that will play a crucial role in our account of the clause-mate condition, while allowing island insensitivity when a suitable paraphrase of the antecedent is available as pre-sluice. The interested reader is referred to Barros et al. 2014, Abels 2017a for detailed discussion and a defense of the island evasion approach.

⁴We are of course aware of the fact that an unrestricted version of Merchant's (2001) theory fails to derive case connectivity (see Lasnik 2005). Possible solutions to this problem are explored in Abels 2017b, Barros 2016. We are also aware of the fact that an unrestricted version of Merchant's theory faces the too-many-paraphrases problem (see Abels 2017a, Chung 2013). We continue on the assumption that these open problems for the island evasion approach can ultimately be solved.

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In this section we have introduced the phenomenon of multiple sluicing and its two most important, cross-linguistically stable properties. The first property is the clause-mate condition. It is the main fact to be explained in this paper. The second property is the apparent island insensitivity of sluicing in general and multiple sluicing in particular. We sketched the island evasion approach and adopted it as the explanation of the second property. The next section introduces our explanation for the clause-mate condition.

2. The account of the clause-mate condition

Recall that the approach to sluicing assumed here posits the presence of syntactic structure subject to normal constraints at the E-site. Such an approach can account for the existence of multiple sluicing and for the clause-mate condition imposed on it if the following two assumptions are made: (i) Movement of the additional *wh*-phrases represents a normal syntactic movement operation, and (ii) movement of the additional *wh*-phrases is clause bound (Dayal 1996).⁵

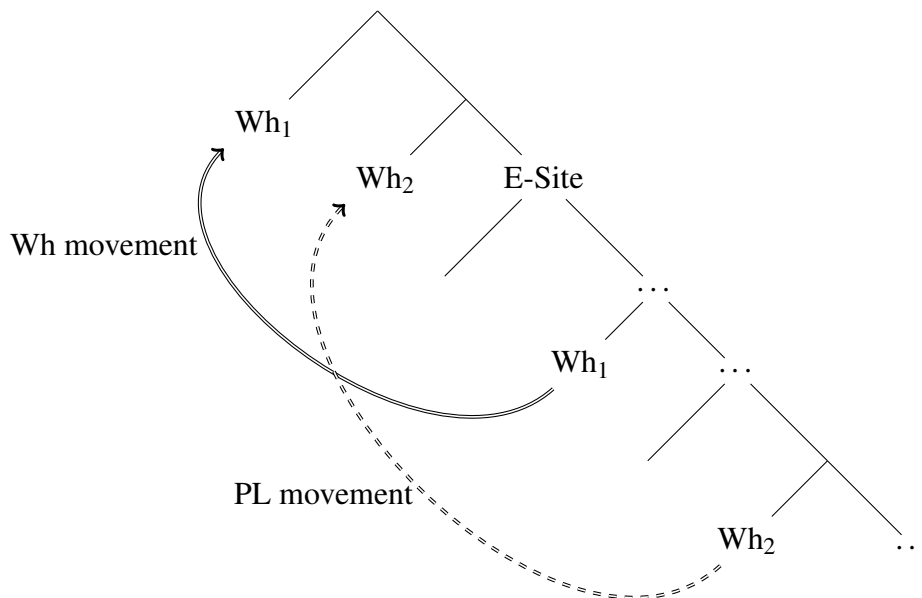
In other words, we postulate a clause bound movement operation affecting the additional *wh*-phrases. For reasons that will become clear later, we call this movement Pair List (PL) movement - although we also invoke it for sluicing with single pair interpretations.⁶ In the following paragraphs, we give substance to our account of the clause-mate condition.

Before deriving the clause-mate condition on multiple sluicing, however, we need to address the question of how multiple sluicing is possible in the first place. The assumptions we have introduced so far lead us to assuming the following schematic structure for grammatical instances of multiple sluicing, where wh_1 and wh_2 originate in the same clause.

⁵Movement of additional *wh*-phrases would thus be much like quantifier raising under the standard view, though see Syrett & Lidz 2011, Wurmbrand 2015, Tanaka 2015.

⁶Since nothing in what follows is affected by the choice, we remain agnostic about the question of whether single pair sluices involve degenerate lists or genuine single pair interpretations derived by PL movement.

(15)



Wh_1 has undergone regular *wh*-movement and wh_2 has undergone Pair List movement. English being a single *wh*-fronting language, Pair List movement is generally covert in English. Pair List movement targets a position outside of the ellipsis site.

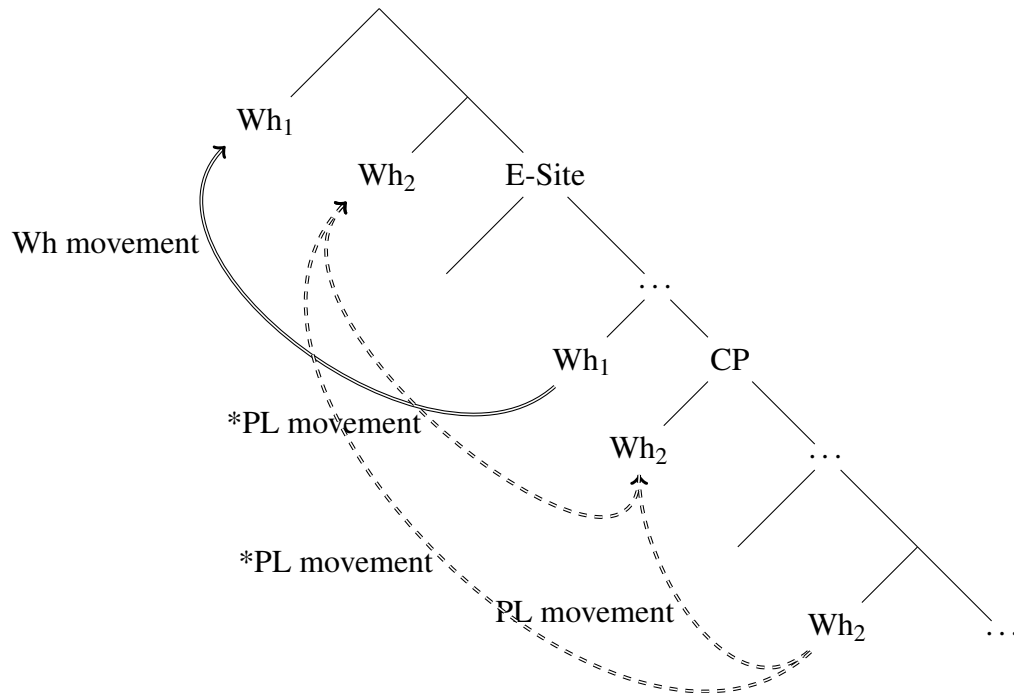
Given that Pair List movement is usually a covert movement operation, how can it become overt under sluicing? Under a single cycle model of syntax with a copy or multidominance view of movement, this is quite straightforward, as has been noted several times in the literature (see Richards 1997, 2001, Ortega-Santos et al. 2014, Manetta 2013, Gribanova & Manetta 2016). A general purpose chain pronunciation algorithm will make sure that for overt movement the highest copy/occurrence in a chain will be pronounced and for covert movement — the lowest available copy (see Gärtner 2002). If we approach ellipsis as PF non-pronunciation, high pronunciation of a covertly moved element under ellipsis becomes the expected outcome: this is the lowest copy that remains after ellipsis. We should note though that this approach as it stands predicts that covert movement can become overt in many more cases than it actually does. For example, the sketch here leads to the incorrect expectation that quantifier raising out of an elided VP should become visible when an object quantifier takes scope over the subject. We have no insights to contribute to the discussion of which covert movements can become overt under ellipsis and which ones cannot. On the view argued for here, movement of the second *wh*-phrase in multiple sluicing is neither PF movement (as proposed for fragments in Weir 2014) nor exceptional overt movement (as proposed for fragments in Shen to appear), but covert movement made overt by ellipsis.

With these preliminaries out of the way, we can now ask how our account derives the clause-mate condition on multiple sluicing. We will see that the derivation of the clause-mate condition requires an additional assumption that we have not introduced yet.

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Tree (16) represents two derivations for a multiple sluice violating the clause-mate condition (where CP is intended to signify the boundary of a tensed clause). Both derivations are straightforwardly ruled out. By assumption Pair List movement is clause bounded. But both derivations violate the clause-boundedness of Pair List movement: either in the form of successive cyclic or in the form of long one-fell-swoop movement. Both derivations are therefore ruled out.

(16)

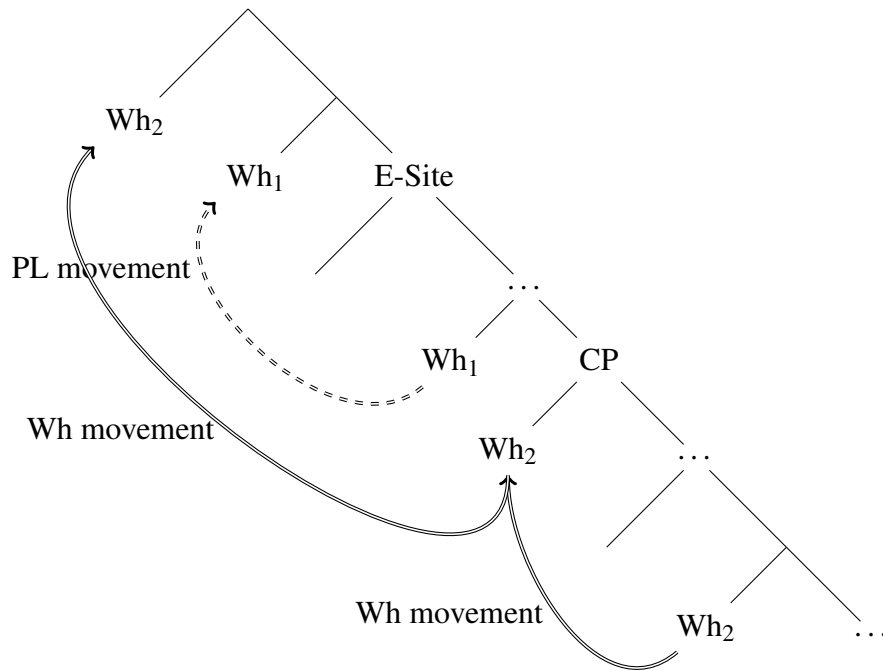


The more challenging structure to rule out is the one in (17). Here, *wh*-movement has been cyclic and Pair List movement clause bound.⁷

⁷Lasnik 2014 fails to discuss or rule out the structures homologous to (17) under his account (replacing clause bounded Pair List movement with clause bounded rightward extraposition), (ia). The example is much worse than Lasnik would expect. Indeed, given that Lasnik assumes that locality violations of *wh*-movement are repaired by ellipsis, the problem runs even deeper, as *Wh*₂ in (17) should be able to originate inside of an island. Clearly, this is a wrong prediction, as (ib) shows. (The discussion and account of the clause-mate condition of *wh*-stripping in Ortega-Santos et al. (2014, 78–79) suffers from the same shortcomings.)

- (i) a. In each instance, Fred said **(?**to someone) that Sally bought a book, but I don't know which book to whom.
- b. **In each case, the fact that some enthusiast had photographed Old Faithful proved useful to some researcher, though I couldn't tell you which enthusiast to which researcher.*

(17)



Nothing in what we have said so far rules out structure (17). The two main properties distinguishing this illicit structure from the licit structure in (15) are the fact that *wh*-movement is cyclic in (17) and short in (15) and that *wh*-movement crosses the trace of Pair List movement in (17) but not in (15). We see no reason to exclude successive cyclic *wh*-movement, but note that the configuration in (17) represents a superiority configuration: Overt *wh*-movement crosses a *c*-commanding unmoved *wh*-phrase.⁸ We conjecture that it is this superiority configuration which is responsible for the ill-formedness of (17). To achieve this, we impose the following additional constraint:

- (18) Only those *wh*-phrases may undergo Pair List movement that have not been crossed by *wh*-movement.

This condition, of course, is by no means novel. It comes directly from Pesetsky 2000. We review independent evidence for this constraint in section 3.1.

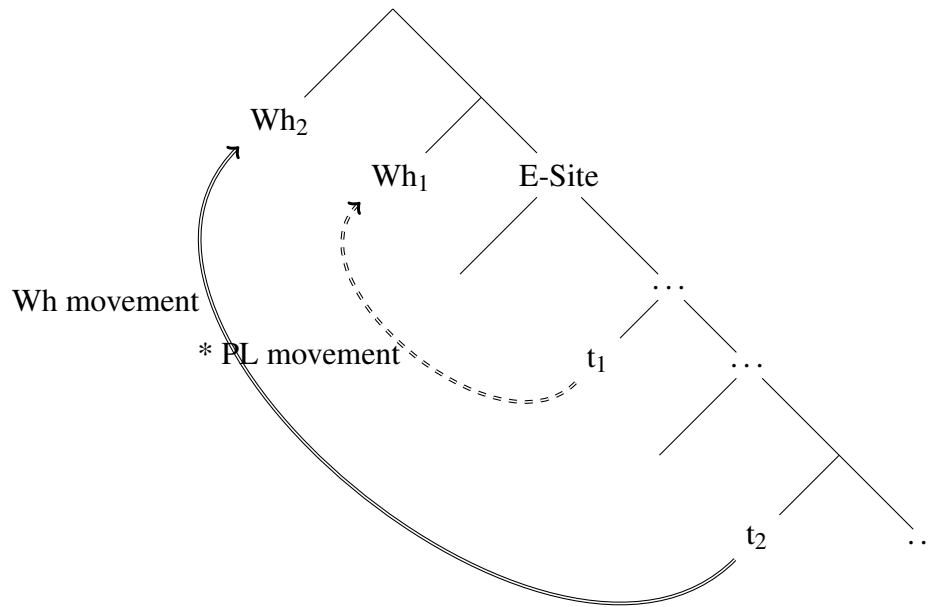
2.1 Multiple sluicing's surfeit of superiority

While our derivation of the clause-mate condition on multiple sluicing is now complete, we hasten to point out that (18) predicts that (19) should be as ill-formed as (17). This is so, because the trace of Pair List movement is again crossed by *wh*-movement.

⁸The wording is deliberately circumspect. Standard superiority effects have well known exceptions. In particular, they disappear when both *wh*-phrases are D-linked. However, the clause-mate condition on multiple sluicing has no such exception for D-linked *wh*-phrases. We can therefore not treat the badness of (17) as a straightforward superiority effect. We do see a superiority configuration, though.

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(19)



This expectation appears to be correct across an interesting range of languages. Consider the following Dutch paradigm. (20) shows that, as expected, there is no superiority effect in a multiple *wh*-question when both *wh*-phrases are D-linked. Example (21) provides sluicing counterparts of these examples. As predicted by (18), a superiority effect shows up under sluicing.

(20) Dutch (A. Neeleman, P. Ackema, H. van de Koot, H. Zeijlstra, p.c.)

- a. Ik vraag me af welk meisje de verdachte welk boek gegeven heeft.
I ask me prt which girl the suspect which book given has
- b. Ik vraag me af welk boek welk meisje de verdachte gegeven heeft.
I ask me prt which book which girl the suspect given has
I wonder which girl gave the suspect which book.

(21) (P. Ackema, H. van de Koot, H. Zeijlstra, p.c.)

- a. Bij elke gelegenheid gaf een meisje de verdachte een boek, maar ik weet
in each case gave one girl the suspect one book, but I know
niet welk meisje welk boek.
not which girl which book
In each case one girl gave the suspect a book, but I don't know which girl
which book.

- b. *Bij elke gelegenheid gaf een meisje de verdachte een boek, maar ik weet
 in each case gave one girl the suspect one book, but I know
 niet welk boek welk meisje.
 not which book which girl

Essentially the same situation we find in Dutch appears to hold in Norwegian (Ø. Nilsen, p.c.) and in Italian (N. Grillo, E. Callegari, p.c.). This is as expected, if covert Pair List movement is subject to superiority.⁹

3. On the properties of pair list movement

In our analysis of the clause-mate condition on multiple sluicing we relied crucially on the following two properties of Pair List movement: (i) Pair List movement is subject to superiority and (ii) Pair List movement is clause bounded. This section summarizes independent evidence that Pair List movement has just these properties.

3.1 On superiority

The discovery that Pair List movement is subject to superiority was first reported in Pesetsky 2000. Pesetsky offers two diagnostic properties of Pair List movement indicating that it is subject to superiority: Intervention effects and Antecedent Contained Deletion. Regarding the first diagnostic, he observes that in superiority obeying configurations like those in (22a)–(22c) both a single pair and a pair list interpretation are accessible. However, in superiority violating configurations like (22d)–(22f), the pair list reading disappears just in case there is an intervener (in the sense of Beck 1996) along the path between the crossed, in-situ *wh*-phrase and its scope: (22f). In other words, Pesetsky claims that a *wh*-phrase is subject to intervention in case it is in situ, has been crossed by *wh*-movement, and is intended to support a pair list interpretation.

- (22) Based on Pesetsky 2000, 60
- Superiority obeying configuration (no crossing)
- | | | |
|----|---------------------------------------|---------|
| a. | Which person read which book? | SP PL |
| b. | Which person did not read which book? | SP PL |
| c. | Which person didn't read which book? | SP PL |
- Superiority violating configuration (crossing)
- | | | |
|----|---------------------------------------|----------|
| d. | Which book did which person read? | SP PL |
| e. | Which book did which person not read? | SP PL |
| f. | Which book didn't which person read? | SP *PL |

⁹The situation in languages where arguments can scramble across each other is somewhat more complicated but appears not to threaten the general picture painted here on the assumption that, at least in some of these languages, scrambling feeds *wh*-movement. See Stjepanović 2003, Grebenyova 2007, 2009, Scott 2012, Bhattacharya & Simpson 2012 for relevant discussion.

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Pesetsky explains this generalization as follows: There are two paths to pair list readings. The first relies on covertly moving the in-situ phrase (by Pair List movement). Pair List movement is subject to superiority and therefore fails when the *wh*-phrase has been crossed. However, Pair List movement is not subject to Beck-style intervention effects. The second path to pair list interpretations does not rely on moving the in-situ *wh* phrase. It is not subject to superiority but it is subject to intervention effects. (Finally, single pair readings are generated in ways immune both to superiority and to intervention effects.)

To further support this approach, Pesetsky shows that an in situ *wh*-phrase may license ACD if it is not in a superiority violating configuration but may not license ACD if it is in a superiority violating configuration. The *wh*-phrase in situ in (23a) has not been crossed by *wh*-movement. It is therefore free to undergo covert Pair List movement. The application of Pair List movement then allows successful ACD resolution without the regress problem.

(23) Pesetsky 2000, 30

- a. I need to know which girl ___ ordered [which boy that Mary (also) did Δ] to congratulate Sarah.
- b. I need to know for which girl *x* and for which boy *y* such that Mary ordered *y* to congratulate Sarah], *x* also ordered *y* to congratulate Sarah. [i.e., I need to know the girl-boy pairs such that both the girl and Mary ordered the boy to congratulate Sarah]

In (24a) by contrast, the in-situ *wh*-phrase has been crossed. Thus, it cannot undergo covert Pair List movement and ACD resolution is blocked. Hence, the example is unacceptable.

(24) Pesetsky 2000, 31

- a. *I need to know which girl Sue ordered [which boy that Mary (also) did Δ] to congratulate ___.
- b. I need to know for which girl *x* and [which boy *y* such that Mary ordered *y* to congratulate *x*], Sue also ordered *y* to congratulate *x*. [i.e., I need to know the girl-boy pairs such that both Sue and Mary ordered the boy to congratulate the girl]

These are the two arguments Pesetsky gives for the assumption that one path to Pair List interpretations involves a type of covert movement subject to superiority.

3.2 On clause boundedness

Extending the ACD diagnostic, Elliott 2015 asks whether the capacity of an in situ *wh*-phrases to license ACD is clause bounded. The crucial paradigm to look at is the following:

- (25) a. Which boy asked out which girl that his brother asked out? PL, SP
- b. Which boy asked out which girl that his brother did? PL, SP

- c. Which of these boys believes Mary likes which teacher Sally also believes that Mary likes? PL, SP
- d. Which of these boys believes Mary likes which teacher that Sally also does Δ ?
- (i) Δ = like t
- (ii) * Δ = believe Mary likes t

The in-situ *wh*-phrase can undergo Pair List movement in (25b) and (25d); consequently, ACD is licensed. However, in (25d) ACD resolution targets only the lower VP. Elliott takes this as an argument that the movement operation involved (our Pair List movement) is clause bounded. K. Syrett (p.c.) suggests that a clearer test might be based on unambiguous examples:

- (26) Which of these boys is surprised that Mary likes which teacher that Sally also {does | is} Δ ?

The version with *does* gives rise to the embedded ACD resolution (Δ =like t) while *is* forces the long construal (Δ =surprised that Mary likes t). To our ear the version with *is* sounds ungrammatical. This is in line with Elliott's conclusion that Pair List movement is clause bounded.

Second, Kotek 2014, 2015, Kotek & Erlewine 2016 observe that the placement of an intervener along the path of Pair List movement in superiority obeying structures can act as a probe for the locality of Pair List movement. Kotek 2015 deploys this diagnostic to demonstrate the island sensitivity of Pair List movement by contrasting high with low interveners in structures schematically like (27). If Pair List movement is island sensitive, then an intervener outside of the island should block a pair list interpretation even in superiority obeying structures while an intervener inside of an island should not have this effect. The data in Kotek 2015 suggest that Pair List movement is indeed island sensitive.¹⁰

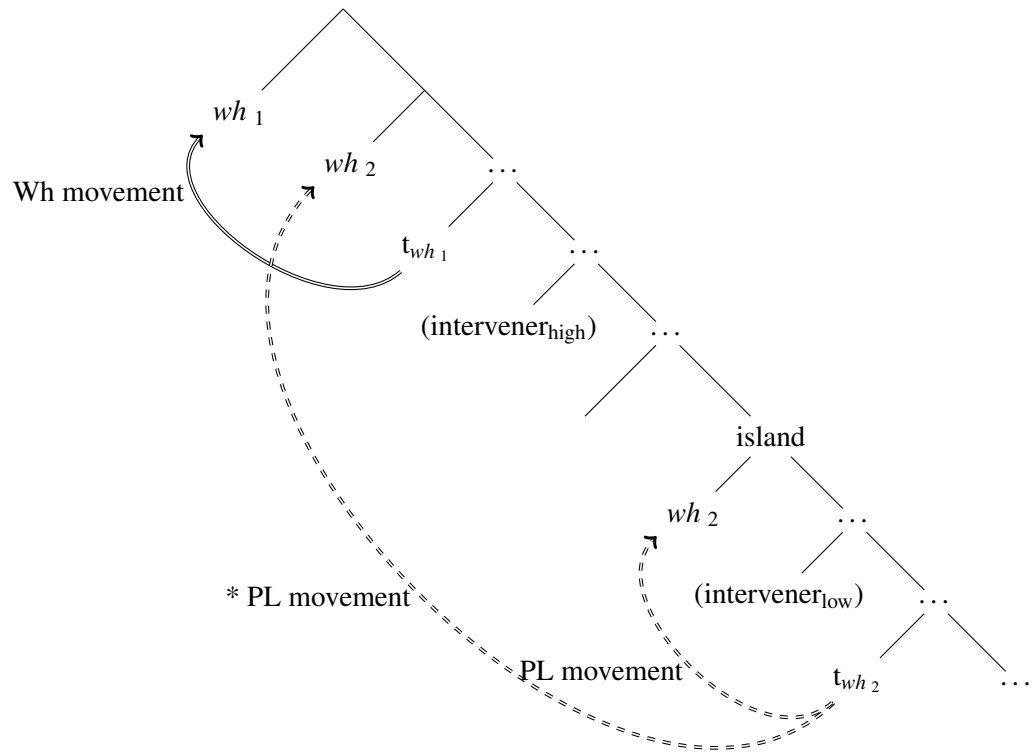
With the same logic one can also evaluate whether Pair List movement is clause bounded: We simply replace the island boundary in (27) with a CP in a bridge context. If Pair List movement is clause bounded, then high (non clause-mate) interveners will suppress pair list readings but low (clause-mate) interveners will not. The closest Kotek comes to this structure is example (28). The example features a weak island created by the manner of speaking verb. The asterisk indicates the lack of a pair list reading.

¹⁰There are some complications here. Not all interveners interact with all kinds of island the same way, as the impossibility of a Pair List reading in (ia) with *only* as an intervener and its availability in (ib) with negation illustrate (judgment: S. Charlow and S. Hansen, p.c.).

- (i) a. Which student only knows where Mary bought which book? PL unavailable
 b. Which student doesn't know where Mary bought which book? PL available

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(27)



- (28) a. *Which protester didnt shout [that we invited which politician]?
 b. Which protester shouted [that we didnt invite which politician]?

The judgment for bridge contexts seems to conform to our expectations, as the following example indicates. Consider the example in a context where there are two newspapers (say the New York Times and the Washington Post) and two candidates (Hilary Clinton and Bernie Sanders). The asterisk again indicates the absence of a pair list reading.

- (29) a. Which newspaper reported that Obama wouldn't support which candidate?
 b. *Which newspaper didn't report that Obama would support which candidate?

The fact that the pair list reading is absent when the intervener is in the higher clause but not when it is in the lower clause points to the clause boundedness of pair list movement.

A final argument that pair list movement is clause bounded comes from trapped lists (see Rațiu 2011, Cheng & Demirdache 2010). To understand trapped lists, we have to look at questions with at least three *wh*-phrases. Triple questions can get lists of triples as answers, single triple answers, but also partial list answers where a single individual is paired with a list of the other two terms. This last option is illustrated by the three answers types in (30).

- (30) Which parent gave which child which toy?
- a. Anna gave Ken a train, Leo a car, and Martin a kite.
 - b. Anna gave Ken a train, Bill gave Klaus a car, and Charles gave Klaus a kite.
 - c. Anna gave Ken a train, Bill gave Leo a train, and Charles gave Martin a train.

Cheng & Demirdache (2010) at length discuss the following observation due to Rațiu 2011: In order to be eligible to form a pair in such an individual+pair list structure, *wh*-phrases must be clause mates, though they may be separated from the fixed individual even by an island boundary. This is schematized in (31), where only *wh*₂ and *wh*₃ can form a partial list to the exclusion of *wh*₁. List formation is ‘trapped’ inside of the CP/island.

- (31) [*wh*₁ [CP/island ... *wh*₂ ... *wh*₃]]

The claim is illustrated below with a triple question where one *wh*-phrase is in the main clause and two are embedded in a finite CP. Only answer (32a) is available.

- (32) Which guest₁ promised that he would give which toy₂ to which child₃ ?
- a. Bill promised that he would give the plane to Sybren and the train to Amina.
 - b. #Bill promised that he would give the plane to Amina and Mary promised that she would give the train to Amina.
 - c. #Bill promised that he would give the plane to Sybren and Mary promised that she would give the plane to Amina.

It should be clear that a clause-bounded mechanism of Pair List movement provides an important hook into understanding this pattern (see Dayal 2016 for discussion of the compositional mechanisms involved in such examples and references to the literature).

In this section we have briefly reviewed Pesetsky’s two arguments for the assumption that Pair List movement is blocked in superiority violating structures and we have provided three arguments to show that Pair List movement is clause bounded. These assumptions were crucial in our account of the clause-mate condition on multiple sluicing.

4. Conclusion

The ideas presented here rest on and are a *prima facie* argument for the presence of syntactic structure at the ellipsis site in sluicing. How else could we explain the obligatorily local relation between the *wh*-phrases? Moreover, the locality sensitivity of multiple sluicing provides a *prima facie* argument for the island evasion approach to the island amelioration problem. After all, the locality sensitivity of multiple sluicing flies in the face of literal island repair mechanisms and of non syntactic approaches. We are, however, keenly aware that the too-many paraphrases problem mentioned in footnote 4 still awaits resolution.

Secondly, covert movement cannot be the correct mechanism for establishing island insensitive long-distance scope for *in situ wh*-phrases. If it were, we would not expect the clause-mate effect on multiple sluicing that we actually find. Covert movement of *wh*-

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phrases is both more limited and more well-behaved. It allows pair list interpretations but is clause bounded and subject to superiority. This explains why multiple sluicing is possible in a proper subset of those structures that allow pair list interpretations (a weaker version of Nishigauchi's 1998 wrong biconditional according to which multiple sluicing is possible in all and only the structures that allow pair list interpretations).

In addition to Pair List movement, we need at least two distinct mechanisms to create single pair and pair list readings. Candidates include approaches interpreting *wh*-phrases through choice functions and/or focus percolation, and approaches interpreting islands as higher order questions. Arguably the most challenging and informative case is provided by example (33) (Lasnik & Saito 1992). (33) involves a superiority violation in the embedded clause, forcing *who* to be interpreted in situ under our assumptions. (33) is ungrammatical if both *wh*-phrases in the embedded clause are interpreted with low scope. However, surprisingly, it is grammatical on the matrix construal of the embedded subject.

(33) Who knows what who bought?

A comprehensive theory of *wh*-interpretation that deals with all of these facts remains a desideratum. The syntactic constraints on Pair List movement visible through the prism of multiple sluicing will hopefully guide and help the creation of such a theory.

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