



Wh-in-situ, from the 1980s to Now

Lisa Lai-Shen Cheng*

Leiden University

Abstract

This article provides an overview of the issues and proposals surrounding *wh*-in-situ since the 1980s. In particular, it discusses the question of whether or not *in-situ wh*-phrases undergo covert *wh*-movement. Aside from reviewing the basic arguments for and against covert *wh*-movement, it considers alternative proposals put forth, ranging from movement of elements other than *wh*-phrases themselves, interpreting in-situ *wh*-phrases using choice function, to disguised movements in various forms. The article concludes with a discussion of intervention effects, as well as a special kind of multiple *wh*-questions, illustrating that covert *wh*-movement is still much needed.

1. Introduction

The phenomenon of *wh*-in-situ has continued to play a major role in syntactic theory forming since the early 1980s. A number of overview articles has appeared in the early 2000s (Watanabe 2001; Cheng 2003a,b; Bayer 2005; Dayal 2005). There is a long list of issues and proposals concerning *wh*-in-situ since the 1980s. In this article, I concentrate on the issue of *covert movement*, namely, the question of whether or not *wh*-items in-situ undergo covert movement.

One of the most fascinating aspects of *wh*-in-situ is that the in-situ *wh*-items, though in-situ, can take wide scope, on a par with moved *wh*-items. In the 1980s, the predominant view is to account for the wide scope with movement, albeit at a different level of representation. Although there are proposals of *resolving the interpretation without movement* (such as Baker 1970; Higginbotham and May 1981; and Pesetsky 1987), the *non-movement alternatives* are only examined more rigorously in the 1990s.

In this article, I will first briefly review proposals in the 1980s of *wh*-movement in Logical Form (LF), discussing the main arguments and motivations for covert *wh*-movement (Section 2.1 and 2.2). In Section 2.3, asymmetries between *overt and covert movement*, as well as between Quantifier Raising and covert *wh*-movement, are discussed. This opens up the discussions of alternatives to covert/LF *wh*-movement of in-situ *wh*-phrases.

I review different alternative approaches, ranging from alternative movement (i.e., not moving the *wh*-phrase per se, but something connected to

it) (Section 3.1), no movement (using other interpretive mechanisms for the wide scope interpretation of *wh*-phrases) (Section 3.2) and **disguised movement** (i.e., movement has taken place for the in-situ *wh*-phrases, but due to other operations, we do not see the movement) (Section 3.3).

In Section 4, I turn to **intervention effects**, which in recent years have played a central role in the discussion of covert *wh*-movement. Towards the end of Section 4, I briefly summarize a recent article on multiple *wh*-questions, that appears to indicate that covert *wh*-movement is needed to generate readings that have not been discussed before.

2. Logical Form *wh*-Movement

There are both syntactic and semantic motivations for covert *wh*-movement, that is, movement at LF. Here, I first mention a few syntactic as well as semantic motivations for covert *wh*-movement. Then, I discuss the ‘downside’ of having covert *wh*-movement.

2.1. PARALLELS BETWEEN OVERT AND COVERT MOVEMENT

2.1.1. Locality

One of the most basic arguments for covert *wh*-movement is the existence of locality effects associated with adjunct *wh*-phrases. First, adjuncts in languages with overt *wh*-movement cannot be extracted out of an island, as the examples in (1) show. These cases are much worse than sentences in which a *wh*-argument (e.g., an object) is extracted from the same environments [compare with sentences in (2)] (examples from Lasnik and Saito 1992).

- (1) a. *Why_i do you wonder whether John left t_i?
- b. *Why_i do you believe the claim that John said Bill left t_i?
- (2) a. ??What do you wonder whether John bought?
- b. ??Who_i do you believe the claim that John said Mary saw t_i?

In the 1980s and early 1990s, the difference between arguments and adjuncts is attributed to the difference between a Subjacency violation and an Empty Category Principle violation. The same pattern of contrast can also be found with *wh*-in-situ in multiple questions. That is, we cannot leave *wh*-adjuncts in-situ in an island, as in (3a,b), while *wh*-arguments in islands are better (4a,b).

- (3) a. *Who wonders whether John left why?
- b. *Who believes the claim that John said Bill left why?
- (4) a. ??Who wonders whether John bought what?
- b. ??Who believe the claim that John said Mary saw who?

Similar patterns are also found in languages like Mandarin Chinese, which do not have overt *wh*-movement. The sentence in (5) can be interpreted

as an indirect question (5a) or as a matrix question (with an indirect question as well) (5b). However, though it can be interpreted as a matrix question, it can only be a matrix question asking for *which person*, but not for *which reason* (as can be seen from the ungrammaticality of (5c)). Example (6) illustrates a typical (ungrammatical) example of an adjunct in-situ in a complex NP island.

- (5) Húfēi xiǎng-zhīdào shéi wèishénme shēngqì (?)
 Hufei want-know who why get-angry
 a. 'Hufei wonders who gets angry why.'
 b. 'for which x, x a person, Hufei wonder why x gets angry'
 c. '*what is the reason x, Hufei wonders who gets angry for x'
- (6) *Qiǎofēng xǐhuān Bótōng wèishénme xiě de shū?
 Qiaofeng like Botong why write de book
 Intended: 'For what reason x such that Qiaofeng likes the book that Botong wrote for x?'

The parallel between questions with moved *wh*-phrases and questions with in-situ *wh*-phrases leads to the null-hypothesis that the in-situ *wh*-phrases also undergo *wh*-movement, albeit covertly, which must also obey locality conditions.

2.1.2. Crossover (see Simpson 1995; Hornstein 1995 among others)

Another parallel between overt *wh*-movement and covert *wh*-movement is the manifestation of crossover effects. Overt *wh*-movement yields both strong and weak crossover violations, as shown in (7a) and (7b), respectively.

- (7) a. *Who_i did he_i give a book to t_i?
 b. *Who_i did his_i mother give a book to t_i?

Example (8a,b) illustrates that *wh*-in-situ also generates strong and weak crossover, just like their moved counterparts in (7). This parallel is accounted for if the in-situ phrases move at LF.

- (8) a. *Who_j said that he_i gave a book to who_i?
 b. *Who_j said that his_i mother gave a book to who_i?

2.2. SYNTAX-SEMANTICS ARGUMENTS

Aside from syntactic parallels between overt *wh*-movement and covert *wh*-movement, two other arguments should also be considered, both of which relate to the interpretation of the *wh*-phrases or the sentences containing the *wh*-phrases.

2.2.1. Selectional Requirements

It is well-known that different verbs select for different types of complement clauses. For instance, verbs such as *ask* require an interrogative complement,

while *believe* must have a declarative complement, and *know* can take both. Huang (1982) argues that verbs in Mandarin Chinese show the same selectional requirements as in English. The relevant examples are shown in (9)–(11).

- (9) Huǎngróng xiāngxìn Guōjìng mǎi-le shěnmē?
 Huangrong believe Guojing buy-PERF what
 ‘What does Huangrong believe that Guojing bought?’
- (10) Qiáofēng wèn wǒ Guōjìng mǎi-le shěnmē/*shu
 Qiaofeng ask me Guojing buy-PERF what/book
 ‘Qiaofeng asked me what Guojing bought./*Qiaofeng asked me
 Guojing bought the book.’
- (11) Bótōng zhīdào Huángróng xǐhuān shéi (?)
 Botong know Huangrong like who
 a. ‘Botong knows who Huangrong likes.’
 b. ‘Who does Botong know Huangrong likes?’

If in-situ *wh*-phrases undergo movement at LF, the selectional requirements of the verb can be satisfied the same way as in English. (For issues of selection, see Grimshaw 1977, 1979; Pesetsky 1982; and Lahiri 1991, 2002). Though selectional requirement at first glance may provide arguments for LF *wh*-movement, it is possible that something else, for instance, a question particle (see Cheng 1991), may fulfil such a role.

2.2.2. Scope-Taking Properties

Another property that is also attributed to covert *wh*-movement is the scope-taking properties of in-situ *wh*-phrases. The multiple *wh*-question (12a) in English can be answered by (12b) or (12c) (taken from Dayal 2005; see also Baker 1970).

- (12) a. Which student knows where Mary bought which book?
 b. Bill knows where Mary bought which book.
 c. Bill knows where Mary bought *Aspects* and Sue knows where Mary bought LGB.

The answer in (12b) is an answer associated with an embedded scope of the in-situ *wh*-phrase, *which book*. The *wh*-phrase in this case is actually not answered. In contrast, (12c) is an answer in which *which book* is answered, indicating wide-scope of the in-situ *wh*-phrase. The wide-scope reading of the in-situ *wh*-phrase in (12c) can be accounted for if the in-situ phrase undergoes movement to the matrix, yielding a multiple question associated with the matrix *wh*-phrase.

Wh-questions in Mandarin Chinese also show this property, though the argument is less clear-cut. Consider first (13).¹

- (13) měi-ge xuéshēng dōu xuǎn-le nǎ yī-mén kè?
 every-CL student DOU choose-PERF which one-CL course
 'Which course did every student choose?'

In (13), the *wh*-phrase takes scope over the universal quantifier. The interpretation of the question is roughly: which course is such that every student chose it? This clearly indicates that though the *wh*-phrase is in-situ, it takes wide scope. The only caveat for this is that if one were to posit a question/*wh*-particle, the wide-scope of the in-situ phrase can be a result of the question particle taking scope over the universal quantifier (following the standard assumption that such a particle is in the CP domain, see Cheng 1991; Li 2006 among others).

2.3. ASYMMETRIES CONCERNING COVERT *WH*-MOVEMENT

Though LF *wh*-movement appears to share many properties with overt *wh*-movement, there are also asymmetries. There are two types of asymmetries: (a) asymmetries between covert and overt *wh*-movement, and (b) asymmetries between Q(uantifier) R(aising) and covert *wh*-movement; in the latter case, both involve operations at LF.

2.3.1. Covert vs. Overt *wh*-Movement

Asymmetry in Subjacency. Consider first the lack of subjacency effects in multiple *wh*-questions in English (data taken from Huang 1995) (see also Cole and Herman 1994).

- (14) a. Who remembers why we bought what? → *wh*-island
 b. Who likes books that criticize who? → CNPC
 c. Who thinks that pictures of who are on sale? → subject condition
 d. Who got jealous because I talked to who? → adjunct condition
 e. Who bought the books on which table? → adjunct
 f. What saw John and who? → coordinate structure constraint

The overt movement counterparts of (14a–f) are all ungrammatical. Chinese *wh*-questions also show the lack of subjacency effects. Huang (1982) considers the bounding theory to be a condition on overt movement only; thus, (14a–f) fall outside the realm of the bounding theory. This essentially treats subjacency as a well-formedness condition on S-structure chains rather than as a condition on movement.

Watanabe (1992) re-examines the controversy over subjacency. In contrast with multiple questions in English and Chinese *wh*-in-situ, which lack subjacency effects, Japanese (and Korean) *wh*-in-situ has been said to induce subjacency effects (see also Wahba 1991 regarding *wh*-in-situ and subjacency

effects in Iraqi Arabic). This then presents a non-uniform picture of *wh*-in-situ, leading to the question of whether *wh*-in-situ should be uniformly handled at LF. In Japanese, we see subjacency with *wh*-in-situ but also the lack of it, as shown in (15a) and (15b) (from Lasnik and Saito 1992).

- (15) a. John-wa [nani-o katta hito]-o sagasite iru no?
 John-top what-acc bought person-acc looking-for Q
 'What is John looking for the person who bought?'
 b. ??John-wa [Mary-ga nani-o katta ka dooka] siritagatte iru no?
 John-top Mary-nom what-acc bought whether know-want Q
 'What does John want to know whether Mary bought?'

Though (15a) is grammatical, (15b) is not: it has the status of a *wh*-island violation (the relative clause in (15a) may have undergone pied-piping; see the discussion on pied-piping in Section 2.3.2). Watanabe (1992) further shows that the picture is more complicated than this if we consider multiple *wh*-questions in Japanese. In particular, if there is one *wh*-word outside of a *wh*-island while another is inside of the *wh*-island, the sentence is grammatical (16a). However, if both *wh*-words are inside the *wh*-island, the sentence is ungrammatical (16b,c):

- (16) a. John-wa [Mary-ga nani-o katta ka dooka] **dare-ni** tazuneta no?
 John-top Mary-nom what-acc bought whether who-dat asked Q
 'Who did John ask t whether Mary bought what?'
 b. ??John-wa [Mary-ga nani-o katta ka dooka] Tom-ni tazuneta no?
 John-top Mary-nom what-acc bought whether Tom-dat asked Q
 'What did John ask Tom whether Mary bought t?'
 c. ??John-wa [**dare-ga** nani-o katta ka dooka] Tom-ni tazuneta no?
 John-top who-nom what-acc bought whether Tom-dat asked Q
 'What did John ask Tom whether who bought t?'

Example (16a) not only contrasts with (16b,c) but also with (15b). It shows that the addition of a *wh*-phrase outside of the *wh*-island voids the *wh*-island effect. (16a) is comparable to the multiple *wh*-question (17a) in English [cf. the question in (17b)]:

- (17) a. Who_i did John ask t_i [whether Mary bought what]?
 b. ??What_i did John ask Tom [whether Mary bought t_i]?

In (17a), there is a *wh*-word *who* outside of the *wh*-island. The sentence is grammatical. The standard explanation is that *who* undergoes *wh*-movement in overt syntax, not crossing any island since it originates outside of the island and the second *wh*-word *what* only undergoes *wh*-movement at LF, which is not subject to subjacency. However, this standard explanation cannot explain the Japanese facts since Japanese only has in-situ *wh*-phrases.

Watanabe argues that the contrast between (16a) and (16b,c) illustrates a two-level movement in multiple questions: the first level is sensitive to subjacency while the second level is not. He further maintains that the

movement which is sensitive to subadjacency is S-structure movement (with the operator part of the *wh*-word in Japanese moving to SpecCP). This is supported by data showing that an interrogative clause constitutes an island for S-structure movement (such as scrambling) in Japanese. The second level of movement is at LF. (Watanabe's proposal thus supports the view that subadjacency only constrains overt operations.)

In other words, given this proposal, Japanese *wh*-in-situ involves S-structure operator movement. Thus, even though we do not 'see' the movement due to the null operator, it is nevertheless movement in syntax; thus subadjacency effects are expected. Watanabe's proposal opens up a new way of looking at *wh*-in-situ: a non-overt part of a *wh*-element undergoes movement in overt syntax (see further discussion of such treatments in Section 3.1).

Asymmetry Reflected in Binding. Consider first the sentences in (18) by Brody (1995: 133):

- (18) a. John_i wondered [which pictures of himself_{i/k}] Bill_k liked t_{wh}.
 b. *John_i wondered when Mary_j saw [which pictures of himself_i].

In (18a), *himself* can have either *John* or *Bill* as antecedent. If *wh*-in-situ undergoes LF *wh*-movement, one would expect *himself* in (18b) to be anaphoric to *John* (i.e., just as *himself* in (18a)). In other words, the asymmetry between (18a) and (18b) supports a view that there is no LF *wh*-movement of in-situ *wh*-phrases. However, consider an example such as (19):

- (19) John_i wondered who saw which pictures of himself_i.

The fact that the co-reference between *John* and *himself* can in fact be established in (19) shows that the situation is more complicated than the apparent contrast presented in (18) (see also Nissenbaum 2000, and related discussions).

2.3.2. Quantifier Raising vs. Logical Form *wh*-movement

It is argued by Longobardi (1991) as well as Reinhart (1991) among others, that subadjacency effects arise with quantifier raising (QR) (see also Simpson 2000). Longobardi shows that although n(egative)-words and the negation marker *non* can have an intervening clausal boundary (as in (20)), no islands can intervene (as in (21a–c)).

- (20) non credo che lui pensi che io desidero vedere nessuno
 NEG believe.I that he thinks that I wish to.see no.one
 'I do not believe that he thinks that I wish to see anyone.'

- (21) a. *non approvarei la tua proposta di vedere nessuno (complex NP)
 NEG approve.I the your proposal of to.see no.one
 'I would not approve your proposal of seeing anybody.'

- b. *chiamare nessuno sara possibile (sentential subject)
 to-call no one will be possible
 'To call no one will be possible.'
- c. *non fa il suo dovere per aiutare nessuno (adjunct clause)
 NEG does.he the his duty for to.help no.one
 'He does not do his duty in order to help anyone.'

The contrast between data such as (21a–c) and (14a–f) leads to proposals offering explanations for the asymmetry between QR and LF *wh*-movement. One such explanation, which is still often appealed to, is pied-piping (see Nishigauchi 1986; Choe 1987; and Pesetsky 1987). Pesetsky (1987) argues that by considering answers to questions, we can see that pied-piping is at work. In particular, in Japanese, normal answers to questions can just be one word (plus a copula) (as in (22)), but when an island is involved, a felicitous answer must recapitulate the entire island (as in (22)).

- (22) Q: John-wa nani-o yonda-no?
 John-TOP what-ACC read-Q
 'What did John read?'
 A: 'Sensoo to Heiwa' desu
 War and Peace COP
 'It's *War and Peace*.'
- (23) Q: Mary-wa [[John-ni nani-o ageta] hito-ni] atta-no?
 Mary-TOP John-DAT what-ACC gave man-DAT met-Q
 'What did Mary meet the man who gave to John?'
 A: */?? Konpyuutaa desu
 computer COP
 'It's a computer.'
 A: [[konpyuutaa-o ageta] hito] desu
 computer-ACC gave man COP
 'It's the man who gave a computer (to him).'

The contrast between (22) and (23) suggests that in the question in (23), *nani* 'what' does not move out of the complex NP; instead, the whole complex NP pied-pipes (the *wh*-feature of the *wh*-word gets percolated to the complex NP).

The pied-piping explanation of the lack of subjacency effects, however, cannot be the whole story. First, it is clear that pied-piping in overt syntax is much more restricted than what has been proposed for LF pied-piping, as shown in (24). In fact, when embedded questions are involved, very little piped-piping is allowed, as shown in (25) (data from Fiengo et al. 1988).

- (24) a. On which table did you put the book? (from Lasnik and Saito 1992)
 b. *After buying what did John leave?
 c. *The man that bought what did John see?
- (25) a. I wonder who Bill spoke to.
 b. ?I wonder to whom Bill spoke.

- c. I wonder whose mother Bill spoke to.
- d. *I wonder pictures of whom Bill saw.
- e. *I wonder Mary and whom Bill saw.
- f. *I wonder the books that who wrote Bill bought.

Given the contrast between overt pied-piping and LF pied-piping, the pied-piping account appears to switch the asymmetry from overt vs. covert *wh*-movement to overt vs. covert pied-piping (see Fiengo et al. 1988 for other problems associated with the pied-piping analysis).

Furthermore, the pied-piping solution is itself problematic. As noted in Fiengo et al. (1988), the pied-piping solution is not applicable to all island violations at LF. As shown in (26), given a subject island containing a *wh*-phrase in Mandarin Chinese, the answer that includes an island (as in (26a)) is not possible.

- (26) Q: [shéikàn zhèběnshū] zuì héshì (adapted from Fiengo et al. 1988, ex. 29)
 who read this book most appropriate
 'That who read this book is most appropriate?'
 a. A: *Zhāngsān kàn zhèběn shū.
 'That Zhangsan read this book.'
 b. A: Zhāngsān.

It has also been pointed out by von Stechow (1996) that the semantic interpretation of large scale pied-piping constituents given by Nishigauchi (1986) is problematic (see Sternefeld 2002 for a proposal to get around the problem).

In short, there are arguments for and against LF *wh*-movement. The analysis that *wh*-in-situ involves *wh*-movement of the *wh*-phrase at LF has been vigorously re-examined in the 1990s. Not only is the asymmetry concerning subadjacency a sore thumb, we are no longer satisfied with the stipulation that the parametric difference rests upon the level of movement (see Cheng 1991; and Tsai 1994b among others). Recent development within the Minimalist Program further provides theoretical grounds for re-examining covert movement.

3. Alternatives to Covert *wh*-Movement

Within the Minimalist Program, a number of issues arise concerning covert *wh*-movement. First, with respect to the extension condition (Chomsky 1995), which ensures that Merge targets root syntactic objects, covert *wh*-movement is an exception. Second, some stipulation seems to be necessary to ensure that in certain languages, *wh*-movement is covert rather than overt (e.g., by weak vs. strong features and *Procrastinate*). Third, any asymmetry between overt and covert *wh*-movement is a problem for the Uniformity Condition (Chomsky 1995), which ensures that covert operations are also available overtly.

In this section, I discuss alternative approaches to covert *wh*-movement. In particular, I review three different types of alternatives: (i) moving some other

element (a particle/operator/feature) instead of the *wh*-phrase; (ii) interpreting in-situ *wh*-phrases without movement (i.e., scoping out the *wh*-phrases without movement); and (iii) ‘disguised’ movement: in-situ *wh*-questions in fact involve ordinary overt *wh*-movement. The in-situeness of the *wh*-phrases results from other operations which mask the overt *wh*-movement.

3.1. MOVEMENT OF A PARTICLE/OPERATOR/FEATURE

One of the problems with *wh*-movement of *wh*-phrases at LF is the asymmetry between movement at LF and movement in overt syntax, as discussed above. Nevertheless, it remains a fact that *wh*-in-situ has a lot in common with *wh*-movement. There are a number of proposals that try to capture such similarities and differences by proposing that what is moved in in-situ *wh*-questions is not the *wh*-phrases themselves but an operator (or a Q-marker) associated with the *wh*-phrase (see also an overview in Watanabe 2001), or a *wh*-feature (see, for example, Pesetsky 2000).

We have briefly discussed Watanabe’s treatment of Japanese *wh*-in-situ in Section 2 in connection with subjacency. As we have seen, the operator in Watanabe’s proposal is linked with the *wh*-phrase. This is also what Hagstrom (1998) and Kishimoto (2005) assume for Sinhala, Japanese and Okinawan (see also Aoun and Li 1993). However, Hagstrom (1998), basing on Tonoike’s (1992) and Kishimoto’s work, takes Watanabe’s proposal further, and claims that what actually moves in Japanese is the question particle itself. In particular, the question marker in Sinhala, Japanese and Okinawan moves to the surface position in the CP from a position adjacent to the in-situ *wh*-phrase. Consider the sentences in (27a–c). Hagstrom takes the *ka* particle associated with the indefinite in (27a) to be the same as the *ka* in (27b,c) (see Hagstrom 1998 for details regarding the interpretation of *ka* (as an existential quantifier and an interrogative marker)). More specifically, *ka* in (27b,c) has moved from the *wh*-word *nani* ‘what’ to its surface position.

- (27) a. John-ga nani-ka-o katta (Kuroda 1965)
 John-nom what-Q-acc bought
 ‘John bought something.’
 b. John-ga nani-o kaimasita ka (Hagstrom 1998)
 John-nom what-acc bought.polite Q
 ‘What did John buy?’
 c. John-ga [Mary-ga nani-o katta ka] sitteiru
 John-nom Mary-nom what-acc bought Q know
 ‘John knows what Mary bought.’

Kishimoto (2005) argues that the particle *də* in Sinhala undergoes either overt or covert movement. The argument is based on an intricate set of facts concerning the position of *də* and the interpretation of the *wh*-questions.

Note that neither Kishimoto (2005) nor Watanabe (1992) completely dispense with LF movement. For Kishimoto, the particle can undergo covert movement. For Watanabe, the second level of movement is a covert level, and furthermore, the *wh*-phrase itself also seems to undergo covert movement at some point. Watanabe (2001) entertains the idea that what is moved in overt syntax is actually not a null *wh*-operator, but rather a *wh*-feature.

3.2. NO MOVEMENT

Aside from alternative approaches using operators/particles for movement, there is another set of alternative approaches, which involves no movement. That is, the scopal properties, for example, are taken care of by other mechanisms, thereby accounting for the scopal similarity between in-situ *wh*-phrases and moved *wh*-phrases. At the same time, the asymmetries follow from the fact that in-situ *wh*-phrases have not undergone movement at all.

3.2.1. Absorption/Unselective Binding

The proposed alternatives involving no movement have various implementations. Reinhart (1998) provides an excellent summary of them, starting off with *absorption* in Higginbotham and May (1981) (henceforth H&M) (see also Baker 1970, which uses indexing on a Q-morpheme for both in-situ and moved *wh*-phrases).

With the absorption mechanism proposed in H&M, the operator associated with the in-situ *wh*-phrase is absorbed by the matrix *wh* operator, resulting in a double operator, as illustrated in (28).

- (28) a. Who_i t_i bought what?
b. for which <x, y>, x bought y

This is comparable to unselective binding, as in Pesetsky (1987). The difference is that for unselective binding, the assumption is that *wh*-phrases are on a par with indefinites. That is, they are comparable to indefinites in having no quantificational force (see Heim 1982, Lewis 1975); they are variables, which need to be bound by quantifiers/operators. In Pesetsky (1987), this mechanism is used to take care of asymmetries associated with D-linked *wh*-phrases in Superiority contexts. Consider the contrast between (29a) and (29b).

- (29) a. Which book did which student read?
b. *What did who buy?

Assuming that (29b) involves an Empty Category Principle violation because *who* undergoes covert *wh*-movement, Pesetsky (1987) proposes that (29a) is grammatical because D-linked *wh*-phrases such as *which student* in (29a) are not quantifiers, and thus do not undergo movement at LF. Instead,

unselective binding takes care of the interpretation of the *wh*-phrase. In particular, the matrix *wh*-operator unselectively binds more than one variable, in this case both the subject and the object variable.

The movement of the D-linked *wh*-phrases in overt syntax (such as *which book* in (29a)) is then due to something other than the operator/quantifier nature of the *wh*-phrases (e.g., formal requirement of the C-head).

3.2.2. Choice Function

Reinhart (1998), working with Minimalist assumptions, argues that absorption or unselective binding is not adequate. Reinhart first argues that there is in fact no LF *wh*-movement involved in *wh*-in-situ questions (see also Simpson 1995, 2000). Aside from the non-parallelisms with respect to subadjacency, she points out that given the notion of economy (Chomsky 1991), we would not expect (30) to be ambiguous:

(30) Who knows where to find what?

The in-situ *wh*-word *what* in (30) can have either embedded or matrix scope (i.e., associated with either *where* or *who*). If *wh*-movement is involved, we do not expect this since, given economy considerations, movement of *what* to the embedded SpecCP should bar further movement to the matrix SpecCP.

With no actual *wh*-movement taking place in syntax or at LF, Reinhart addresses the question of how in-situ *wh*-words can be interpreted. Consider a *wh*-question in Mandarin:

- (31) Zhāngsān mǎi-le shěnmē
 Zhangsan buy-PERF what
 a. 'which *x*, *x* a thing, such that Zhangsan bought *x*'
 b. 'which *x*, such that Zhangsan bought *x*, *x* a thing'

If we assume that the *wh*-word *shěnmē* 'what' in (31) has not undergone traditional *wh*-movement at LF, the interpretation indicated in (31a) is not easily attained (regardless of whether a feature set or an operator associated with the *wh*-word moves or not; see Chomsky 1995 for *wh*-feature movement at LF). Instead, we would have (31b) (the interrogative force can be from a non-overt *wh*-particle (Cheng 1991) or a non-overt *wh* operator (as proposed in Aoun and Li 1993 or Watanabe 1992)). In other words, if an in-situ element is left in-situ and we interpret it without any extra mechanism (with simple absorption or unselective binding), then the restriction of the *wh*-element also remains in-situ. The problem that arises from this can be seen from examples such as (50).

- (32) Who will be offended if we invite which philosopher?
 a. for which $\langle x, y \rangle$, if we invite *y* and *y* is a philosopher, then *x* will be offended.

- b. Luci will be offended if we invite Donald Duck.
- c. for which $\langle x, y \rangle$, y is a philosopher, and if we invite y , x will be offended.

Given an example such as (32), if the in-situ *wh*-phrase is interpreted in-situ, the restriction of the in-situ phrase remains in an *if*-clause, as shown in (32a). This implies that anything that is not a philosopher can be a value for y , allowing (32b) as a possible answer to the question in (32). To avoid this, the restriction of the *wh*-phrase *which philosopher* must be 'pulled out' (as represented in (32c)).

The question that arises is how we can achieve the 'pulling out' of the restriction without *wh*-movement. Reinhart proposes that Choice functions (i.e., functions applying to a non-empty set and yielding an individual member of the set) can achieve this. Reinhart shows that the wide scope reading of existentials can be explained by quantification over choice functions (since the variable associated with the Choice function can be bound arbitrarily far away; see Reinhart 1998 for details). By extension, since *wh*-phrases are existential quantifiers, the same mechanism can be applied. (32) then would have the informal representation (33a); the semantic representation is indicated in (33b), from Reinhart (1998: 41, ex. 24b,c).

- (33) a. for which $\langle x, f \rangle$, if we invite $f(\text{philosopher})$, x will be offended
- b. $\{P \mid (\exists \langle x, f \rangle) (\text{CH}(f) \ \& \ P = \wedge((\text{we invite } f(\text{philosopher})) \rightarrow (x \text{ will be offended})) \ \& \ \text{true}(P))\}$.

The choice function analysis also provides an account for the argument-adjunct asymmetry mentioned in Section 2.2.1. Reinhart argues that the argument-adjunct asymmetry should be considered an argument-adverbial asymmetry: though both *how* and *what way* are adjuncts (syntactically and semantically), only the adverbial adjunct *how* leads to a *wh*-island violation in (34).

- (34) a. *Who fainted when you behaved how?
- b. Who fainted when you behaved what way?

To explain this contrast, Reinhart claims that *wh*-adverbials differ from *wh*-NPs in that (i) the former does not have an N-set (and thus no N-role or variable) and (ii) they denote functions ranging over higher-order entities. In other words, *wh*-adverbials cannot be interpreted via choice functions, and are therefore unable to be interpreted in-situ (and must be interpreted in SpecCP). This, according to Reinhart, explains why sentences such as (35) are ungrammatical:

- (35) *Who arrived why?

Note however that it is not the case that *wh*-adverbials can never stay in-situ. In Chinese/Japanese, *wh*-adverbials can stay in-situ just as *wh*-arguments. If in-situ *wh*-phrases in Chinese/Japanese are also interpreted via

choice function, then we do not expect *wh*-adverbials to be licit. Tsai (1994) also argues for an argument-adverbial distinction. However, he argues that though *wh*-arguments do not undergo covert *wh*-movement, *wh*-adverbials do.

3.3. DISGUISED MOVEMENT

There are two different types of approaches that I would like to discuss under ‘disguised’ movement. Both types share the basic idea that there is no LF *wh*-movement and that the in-situ *wh*-phrases have actually undergone overt movement. The fact that they have undergone overt movement takes care of the scopal properties of in-situ *wh*-phrases. The difference between the two types of approaches rests upon how the *wh*-phrases end up appearing as if they are in their canonical position. Below I first discuss approaches that use remnant movement.

3.3.1. Remnant as Disguise

In the spirit of Kayne (1998), a number of proposals have been put forth to re-analyze *wh*-in-situ. The general idea is that the ‘in-situ’ *wh*-phrase has actually undergone overt movement to the left periphery. However, other operations (e.g., remnant movement) which follow the *wh*-fronting mask the earlier step. Here I first briefly discuss Munaro, Poletto and Pollock (2001) and then a more radical treatment of Bangla *wh*-in-situ by Simpson and Bhattacharya (2003).

French – Munaro, Poletto and Pollock (2001). The goal of this article is to compare French and Bellunese *wh*-movement, in particular, certain asymmetries between French and Bellunese. They propose a more articulated CP-field with both ForceP and NewInformationP (NIP; similar to FocusP), which are relevant for *wh*-elements. In between ForceP and NewInformationP is GroundP, which hosts presupposed elements, including remnant IP.

The analysis of *wh*-in-situ in French rests upon a discourse-configurational analysis of interrogatives. In particular, *wh*-phrases have to be in focus, and thus are moved to NIP. Furthermore, since French has both overt *wh*-movement and *wh*-in-situ, it is claimed that sentences with *wh*-in-situ in French are truncated clauses, lacking a ForceP. *Wh*-phrases in French undergo movement to NIP, with subsequent remnant movement of the IP to the GroundP (as schematized in (36a)). In the overt *wh*-movement cases, the *wh*-phrase further moves to ForceP (36b). In the case of *wh*-in-situ, we only have truncated sentences: there is no ForceP for the *wh*-phrase to move to, yielding an ‘apparent’ *wh*-in-situ sentence.

- (36) a. $[_{\text{GroundP}} [_{\text{NIP}} \textit{wh}\text{-phrase}_i [_{\text{IP}} \dots t_i \dots]]]$ (*wh*-in-situ)
- ↖
- b. $[_{\text{ForceP}} [_{\text{GroundP}} [_{\text{IP}} \dots t_i \dots]_j [_{\text{NIP}} \textit{wh}\text{-phrase}_i] t_j]]$ (overt *wh*-movement)
- ↖

The analysis of *wh*-elements moving to NIP/FocusP yields a possible explanation of why *que* in French cannot be in-situ: it is too light to be in FocusP (in contrast with *quoi*).

This proposal provides a motivation for the remnant IP movement, that is, the IP contained presupposed elements and thus must be in GroundP. However, what is still needed is an explanation of why 'in-situ' questions are truncated sentences. Furthermore, this type of analysis is more difficult to extend to in-situ languages such as Chinese or Japanese, since it would imply that these languages always have truncated sentences.

Bangla – Simpson and Bhattacharya (2003). Simpson and Bhattacharya (2003) (henceforth S&B) reconsiders Bangla (Bengali), which is normally considered to be an SOV language with *wh*-in-situ. It is well-known that both SOV and SVO orders are possible in Bangla if O is a complement clause. They discuss the asymmetry found with complement clauses containing a *wh*-phrase: if a *wh*-phrase is in the complement clause, only the order SOV is licit (for a matrix/wide scope reading of the *wh*-phrase). They argue against an extraposition analysis of SVO order, and propose that the base order in Bangla is actually SVO, with SOV order being derived by pied-piping.

The underlying hypothesis in connection with the pied-piping of the complement clause (containing a *wh*-phrase) is that there is overt *wh*-movement, though the movement is not to the left of the subject, but rather to the right of the subject.

A number of pieces of supporting evidence are presented in the article, and I discuss a couple of these here. First, they show that in sentences with two embeddings, the lower embedding (CP₃) can move to the right of the matrix subject position, as shown in the schema in (37).

(37) Subj₁ [_{CP3} ... *wh* ...]_i V₁ [_{CP2} Subj₂ V₂ t_i]

In such a position, the *wh*-phrase can take matrix scope (38a) (yielding a matrix interrogative). Interestingly, the post-subject position is also a position that hosts *wh*-DPs (38b) and focus DP (38c).

- (38) a. jɔn [_{CP} ke cole gæche]_i bollo t_i (=S&B's 16)
 John who left gone said
 'Who did John say left?'
 b. jɔn ke_i bollo [_{CP} t_i cole gæche] (=S&B's 17)
 John who said left gone
 'Who did John say left?'
 c. jɔn [HÆMLET]_i bhablo [_{CP} meri bollo [_{CP} su poɾeche t_i]] (=S&B's 24c)
 John Hamlet thought Mary said Sue read
 'It was *HAMLET* that John thought Mary said Sue read.'

For S&B, if the base order of Bangla is SVO, then the above patterns can

be explained. They also mentioned (in footnote 4) that typical SOV order arises due to DP Case-licensing. Aside from the typical Case licensing, focused and *wh*-elements (DPs and CPs containing *wh*-phrases) must undergo *Focus/wh*-licensing. This then in principle accounts for the impossibility of a string such as SVO_{wh} .

To ensure a $SO_{wh}V$ order with O_{wh} moving to a focus position in the left periphery, the subject must also undergo movement to a topic position. Furthermore, to rule out SVO_{wh} , it is necessary that the verb does not move past the focus position. However, Bhatt and Dayal (2007) point out a problematic example in Hindi-Urdu for S&B.² Consider the sentence in (39).

- (39) Sita-ne dhyaan-se dekh-aa kis-ko thaa?
 Sita-ERG care-with see-PFV who-ACC be.PST
 ‘Who had Sita looked at carefully?’

The participial verb *dekh-aa* ‘see-PFV’, however, can move past the focus position. In other words, the restriction on verb movement has to disallow tensed verb to move past focus while allowing participial verbs to undergo such movement.

3.3.2. Pronounce Lower Copy

Given the copy theory of movement (see Chomsky 1995), movement in overt syntax creates a chain with two copies (or more), which are then subsequently interpreted by both the PF and the LF interface. Bobaljik (2002), in an article examining A-movement, proposes that the two interfaces can determine which copy is privileged to be interpreted and they do not have to act in sync. That is, the interfaces can choose to both interpret the upper copy; this creates the typical movement scenario, in which we ‘see’ the movement because the upper copy of the moved element is pronounced and it is also the one that LF interprets. On the other hand, PF can choose to pronounce the lower copy, while LF chooses to interpret the higher copy, creating a scenario in which if we only look at the PF, it is as if the element has not moved, while qua interpretation, it appears to have moved (see Bobaljik 2002 for details).

This proposal can be extended to accommodate *wh*-in-situ: with movement of the *wh*-phrase in narrow syntax, with subsequent PF interpretation of the lower copy and LF interpretation of the higher copy. In Reintges, LeSourd and Chung (2006), this is taken up to account for *wh*-questions in Coptic Egyptian. In particular, *wh*-in-situ questions in Coptic Egyptian are accompanied by ‘relative tenses’, which also appear in relative clauses. Relative tenses serve therefore as a diagnostics for *wh*-movement. In the case of *wh*-in-situ, the in-situness is due to the fact that at PF, the lower copy, rather than the higher copy, is spelled out.

Although this account of Coptic Egyptian seems to be plausible, much

more needs to be done (within the ‘Pronounce lower copy’ approach) to see how the asymmetries associated with *wh*-in-situ questions can be accounted for. The other option is to consider the possibility that there are indeed many different types of *wh*-in-situ (as suggested in Cheng and Rooryck 2002; Reintjes et al. 2006).

4. Back to LF *wh*-Movement?

Although there are attempts to keep LF *wh*-movement out of the computation, as we have seen above, none of the attempts can take care of all the symmetries or asymmetries that we find between overt *wh*-movement and LF *wh*-movement. In this section, I first discuss intervention effects, which have been treated with LF *wh*-movement, and examine some recent analyses of intervention effects, which have implications for LF *wh*-movement. In Section 4.3, I briefly discuss Cheng and Demirdache (forthcoming), which may indicate that LF *wh*-movement is still needed.

4.1. INTERVENTION EFFECTS

Beck (1996), working under the assumption that there is LF *wh*-movement, shows that **in German an in-situ *wh*-phrase in a scope-marking sentence or in a multiple question cannot be c-commanded by a negation, or a quantifier such as *every*** (i.e., inherently quantified expressions), as in (40a) and (40b). These form **interveners, blocking LF *wh*-movement**, yielding the so-called ‘Intervention effects’.³

- (40) a. ??Wen hat niemand wo gesehen?
 whom has nobody where seen
 ‘Where did nobody see whom?’ 没人在哪看到谁?
 b. ??Wer hat jede Aufgabe wann gelöst?
 who has every problem when solved
 ‘Who solved every problem when?’ 谁在什么时候解决了每个问题?

Beck and Kim (1997), Tanaka (1997) (see also Hoji 1985, and Hagstrom 1998) have discussed intervention effects in languages with in-situ *wh*-phrases, such as Japanese and Korean (see Soh 2005 for related facts in Mandarin Chinese). In both Japanese and Korean, overt scrambling of the in-situ *wh*-phrases over the interveners cancels the intervention effects, as shown in (41a,b).

- (41) a. *Amuto muôŝ-ûl sa-chi anh-ass-ni? (=Beck & Kim
 anyone what-ACC buy-CHI not do-Past-Q 1997, ex. 2a,b)
 b. Muôŝ-ûl_i amuto t_i sa-chi anh-ass-ni?
 what-ACC anyone buy-CHI not do-Past-Q

‘What did no one buy?’

The basic idea in Beck and Kim (1997) for accounting for the difference between (41a) and (41b) is that after LF *wh*-movement of the in-situ *wh*-phrase, the trace of the *wh*-phrase is in a Negation Induced Barrier (see Beck and Kim 1997 for detail). On the other hand, after scrambling, the LF-trace of the *wh*-phrase is outside of Negation Induced Barrier, and thus, no intervention effects arise.

This analysis relies upon LF *wh*-movement to create a LF-trace (see Tanaka 1997, 2003, for an alternative analysis, which however still uses LF *wh*-movement).

Pesetsky (2000) discusses intervention effects in English. He distinguishes two types of covert movement: **covert phrasal movement** and **covert feature movement**. QR is an example of covert phrasal movement. He argues that within the Minimalist Program, **feature-movement should be allowed at LF, since at LF, no pied-piping of the category is needed**. Furthermore, he shows that feature movement differs from phrasal movement in that the former is sensitive to intervention effects. Consider the superiority data below:

- (42) a. Which book did which student read?
 b. Which book didn't John give to which student?
 c. *Which book didn't which student read?

(42a) is an example showing that D-linked *wh*-phrases can avoid superiority. In Pesetsky (1987), it is argued that such *wh*-phrases do not need to undergo *wh*-movement; instead, unselective binding takes care of the interpretation of the in-situ *wh*-expression (see the discussion on unselective binding above). Pesetsky (2000) suggests that there is indeed movement, though not category movement. He argues that movement of the formal feature of *which student* in (42a) checks the *wh*-feature, and this is blocked in (42c), since there is an intervening negation. In other words, feature movement is sensitive to interveners such as negation. Pesetsky extends it further and argues that feature movement, in contrast with phrasal movement, is sensitive to intervention effects.

Guerzoni (2006), using **Antecedent-Contained Deletion (ACD)** as a diagnostic of QR, argues that long-distance NPI-licensing does not involve QR (which is assumed to be phrasal movement), since NPI in subject position involving ACD is ungrammatical (43b), while NPI in subject position without ACD is grammatical (43a).

- (43) a. I didn't say that anyone came to my party. [Guerzoni 2006, ex. (11)]
 b. *John didn't say that [any student that Maria did] met Bill.

She then argues for an extension of Pesetsky's feature movement analysis to cover NPI-licensing. This not only provides extra support for feature

movement, but also indicates a possible difference between two types of LF operations, that is, QR and *wh*-movement (as we have also discussed above in Section 2.3.2). In particular, QR involves phrasal movement while *wh*-movement at LF involves feature movement.

4.2. NON-SYNTACTIC TREATMENTS OF INTERVENTION EFFECTS

Recently, there are a couple of proposals that argue for a non-syntactic treatment of intervention effects.

4.2.1. Beck (2006)

Beck (2006) examines what she calls the ‘core’ case of intervention effects (see also Kim 2002), namely, intervention effects triggered by focus elements.⁴ As shown by the contrast between (44a) and (44b), the *wh*-question with the in-situ *wh*-phrase *nuku* ‘who’ in Korean is ungrammatical if there is a c-commanding focus subject *minsu-man* ‘only Minsu’. This contrasts with (44c) in which the focus phrase does not c-command the in-situ *wh*-phrase.

- (44) a. *Minsu-man nuku-lûl po-ss-ni? [Korean; Beck’s 2006 (2a–c)]
 Minsu-only who-ACC see-Past-Q
 ‘Who did only Minsu see?’
 b. Minsu-nun nuku-lûl po-ass-ni?
 Minsu-TOP who-ACC see-Past-Q
 ‘Who did Minsu see?’
 c. nuku-lûl Minsu-man po-ass-ni?
 who-ACC Minsu-only see-Past-Q
 ‘Who did only Minsu see?’

Leaving the technicalities aside, the basic intuition in Beck’s article is that *wh*-phrases differ from non-interrogative focus phrases in that they have no ordinary semantic values; rather they introduce a set of alternatives, just as focus phrases also do. The problem with sentences such as (44a) (with the schema such as (45)) is that within the phrase φ , the semantic values of the focus XP and the *wh*-phrase are not compatible – in order for the focus sensitive operator to evaluate φ , the ordinary semantic values are needed for the focus phrase. But the *wh*-phrase does not have such values.

- (45) [Q . . . [Op [φ . . . XP_F . . . wh . . .]]]
 – Q = question operator
 – Op = focus sensitive operator

At a first glance, this way of analyzing the intervention effect seems to side-step LF *wh*-movement entirely. However, as pointed out by Beck herself, English *wh*-questions such as (46a,b) appear problematic because the in-situ *wh*-phrases have a c-commanding focus element or a negation. Following Pesetsky’s (2000) analysis, Beck indicates that the analysis that she develops

can be considered as the interpretation strategy that underlies 'feature movement'. In other words, for Beck (2006), sentences such as (46a,b) and (47a) are grammatical because covert phrasal movement of the in-situ *wh*-phrases such as *who* and *what* is allowed, and phrasal movement is not interpreted using the mechanism proposed in Beck (2006). However, the only way to interpret *which*-phrases and thus *which girl* in (47b,c) is via feature movement, and thus the interpretational strategy proposed in Beck.

- (46) a. Who did only John introduce to whom?
b. Which children didn't buy which book?
- (47) a. Which girl did (only) Mary introduce __ to which boy?
b. Which boy did Mary introduce which girl to __ ?
c. ??Which boy did only Mary introduce which girl to __?

4.2.2. Tomioka (2007)

Tomioka's (2007) article re-examines intervention effects in Japanese and Korean. The interveners that he discusses in his article happen to not include the core case in Beck's article. Instead, the interveners include NPIs, certainly quantificational NPs, disjunctive NPs as well as nominative subjects. Furthermore, Tomioka points out that not only does scrambling void the intervention effects, intervention effects become weaker in embedded contexts.

The data that Tomioka presents are difficult to account for under either a focus account (Beck 2006), or a feature movement account (Guerzoni 2006). He thus suggests to derive the intervention effects in Japanese and Korean from information structure. In particular, he observes that the interveners all share the property that they cannot be topic-marked. In Japanese, this means that these are expressions that cannot have the topic marker *wa* attached to them. He calls these 'anti-topic items'. According to Tomioka, this means that even though these items can be in the 'ground' part of the sentence (following the theory of information packaging of Vallduví 1992, 1995), they cannot be links (which are essentially topics). Rather, they have to be in the tail portion of the ground. Scrambling of the *wh*-elements (such as the example in (44c)) puts the anti-topic elements in the tail part of the sentence (the phonologically reduced part of the sentence). As a result, scrambling can void the so-called intervention effects.

The fact that embedded contexts weaken the intervention effects can also follow from this analysis, assuming that there is no topic-focus articulation in embedded sentences.

Although the above analysis seems to be rather convincing, the question still arises concerning the connection between Beck's core case of intervention effect and the anti-topic items. As Tomioka himself also indicates, the anti-topic items may all share something in common; that is, they may all have an inherent property of not being compatible with

being a topic. One possibility is that these are in fact focus items or they involve focus-sensitive operators. This then connects back to Beck's core case, and possibly the feature movement analysis of Guerzoni (2006). It is therefore still possible and worthwhile to develop a unified analysis of intervention effects, covering the core cases, as well as cases involving the anti-topic items.

4.3. MULTIPLE *WH*-QUESTIONS

Cheng and Demirdache (forthcoming) examines *wh*-questions involving three *wh*-phrases, and in particular, a special reading which they term 'trapped pair-list readings'. Consider first the questions in (48).

- (48) a. Which guest promised to give which toy to which child?
 b. Which guest promised that he would give which toy to which child?

Both questions allow not only a list of triples answer (49a), but also an answer in which the lower two *wh*-phrases pair up without pairing up with the matrix *wh*-phrase (49b).

- (49) a. Bill promised to give a car to Sybren, John promised to give a ball to Amina, and Sam promised to give a plane to Ilea.
 b. Bill promised to give a car to Sybren, a ball to Amina, and a plane to Ilea.

The answer given in (49b) corresponds to the 'trapped pair-list reading', in which all three *wh*-phrases are answered, though only the lower two *wh*-phrases are paired-up.

Interestingly, Romanian, a multiple *wh*-movement language, also allows *wh*-questions with trapped pair-list readings. However, from the Romanian data, it is clear that there are restrictions on the trapped pair-list reading. Consider first the Romanian question in (50).

- (50) [CP₁ **Cine_i** [IP₁ **t_i** o cunoaște pe studenta
 Who CL.3.FS know PREP student
 [CP₂ căreia **unde_j ce_k** i s- dedicat **t_k t_j** ieri
 who.DAT where what CL.DAT.3SG EXPL.AUX dedicated yesterday
 'Who knows the student to whom was dedicated what where yesterday?

This question involves a complex NP island. Note that *wh*-phrases are island sensitive in Romanian. The question in (50) allows both a single pair answer (i.e., not a pair-list reading), or a trapped pair-list answer (with the lower two *wh*-phrases giving a pair-list answer). Consider now the questions in (51a,b), both of which do not involve an island.

- (51) a. [_{CP₁} **Cine** a spus ca **unde ce** va offeri satului
 who said that where what will offer the.village
 Who said that he will offer the village what, where?
- b. [_{CP₁} **Cine unde ce** a spus ca va offeri satului
 who where what said that will offer the.village
 ‘Who said that he will offer the village what where?’

In (51a), the second and the third *wh*-phrases undergo partial *wh*-movement to the edge of the lower clause, while in (51b), the *wh*-phrases move to the matrix. The interesting difference between these two questions is that the trapped pair-list reading is only possible in (51a) and not in (51b). In other words, only when the *wh*-phrases remain inside the embedded clause, do we get a trapped pair-list reading.

Turning back to the English questions in (48), Cheng and Demirdache (forthcoming) infer from the Romanian facts that the *wh*-in-situ phrases in English can also undergo partial *wh*-movement. Leaving the details of the semantic analysis aside, the proposal essentially suggests that there is covert partial *wh*-movement. If this is indeed correct, this analysis requires an LF representation that cannot be taken care of by typical choice function, let alone the other alternative analyses to LF *wh*-movement, since the *wh*-phrases here do not simply take matrix scope (see Cheng and Demirdache forthcoming for details).

5. Conclusion

As we can see from the above discussion, there is still no full agreement on whether or not there is covert *wh*-movement. If as I have suggested in Section 4, we cannot avoid covert *wh*-movement, then we need to reconsider the locality effects at LF, and the asymmetries between LF and overt movement. In particular, if cyclicity in overt syntax rests upon PF linearization (see Fox and Pesetsky 2005, as well as the commentary articles in the same issue), the question that arises is whether we actually expect to find locality effects at LF; if yes, in which way.

We have seen in recent years more and more discussions on different types of *wh*-in-situ languages. I believe that such investigations will eventually bring us to a better understanding of how in-situ *wh*-elements are interpreted and whether and how covert movement is involved.

Acknowledgement

I would like to thank the audience in the Chinese University of Hong Kong, where I gave a lectures series on *wh*-in-situ in 2008. This lecture series helped me write up this article.

Short Biography

Lisa Lai-Shen Cheng's research deals with comparative syntax, syntax–semantics interface as well as syntax–phonology interface. Her research project on Bantu syntax has just been completed, and her new projects include a comparative syntax project on the functional categories of Kwa and Chinese languages, and a project on nouns and noun phrases, comparing Bantu, Chinese and Romance languages. Cheng holds a BA and MA from the University of Toronto and a PhD from MIT. She is now Chair Professor of Linguistics in Leiden University. She is the co-founder of **Leiden Institute for Brain and Cognition**, which started in 2006. This institute fosters research from various disciplines, including linguistics, psychology, biology and medicine.

Notes

* Correspondence address: Lisa Lai-Shen Cheng, Department of Linguistics, P.O. Box 9515, Leiden, 2300 RA, The Netherlands. E-mail: l.l.cheng@let.leidenuniv.nl.

¹ *Dou* is often glossed as 'all', though it is often considered as a distributive quantifier (e.g., Lin 1998). I leave it simply as *DOU* since it does not bear upon the discussion here (see also Cheng 2009).

² S&B indicates that their proposal can be extended to account for similar languages, and Hindi-Urdu would be such a language.

³ The interveners which can yield a distributive reading can lead to a grammatical sentence, but not the intended reading. See Beck 1996 for details and discussion.

⁴ The core cases are cases that are crosslinguistically the most stable ones, according to Beck (2006).

References

- Aoun, Joseph, and Audrey Yen-hui Li. 1993. Wh-elements in-situ: syntax or LF? *Linguistic Inquiry* 24.199–238.
- Baker, C. L. 1970. Notes on the description of English questions: the role of an abstract Q morpheme. *Foundations of Language* 6.197–219.
- Bayer, Josef. 2005. Wh-in-situ. *The Blackwell Companion to Syntax*, ed. by Martin Everaert and Henk C. van Riemsdijk, 376–438. Oxford: Blackwell Publishers.
- Beck, Sigrid. 1996. Quantified structures as barriers for LF movement. *Natural language semantics* 4.1–56.
- . 2006. Intervention effects follow from focus interpretation. *Natural Language Semantics* 14.1–56.
- Beck, Sigrid, and Shin-Sook Kim. 1997. On Wh- and operator scope in Korean. *Journal of East Asian Linguistics* 6.339–384.
- Bhatt, Rajesh, and Veneeta Dayal. 2007. Rightward scrambling as rightward remnant movement. *Linguistic Inquiry* 38.287–301.
- Bobaljik, Jonathan David. 2002. A-chains at the PF-interface: copies and 'covert' movement. *Natural Language and Linguistic Theory* 20.197–267.
- Brody, Michael. 1995. *Lexico-Logical Form, A Radically Minimalist Theory*. Cambridge, Mass: MIT Press.
- Cheng, Lisa L.-S. 1991. *On the Typology of Wh-questions*. MIT: PhD dissertation. Published in 1997, by Garland Publishers.
- . 2003a. Wh-in-situ. *Glott International* 7(4).103–109.
- . 2003b. Wh-in-situ. *Glott International* 7(5).129–137.

- . 2009. On *every* type of quantificational expression in Chinese. Quantification, Definiteness, and Nominalization, ed. by Monika Rather and Anastasia Giannakidou, 53–75. Oxford: Oxford University Press.
- Cheng, Lisa L.-S., and Hamida Demirdache. To appear. Trapped at the edge: on long-distance pair-list readings. *Lingua*.
- Cheng, Lisa L.-S., and Johan Rooryck. 2002. Types of Wh-in-situ. Unpublished manuscript. Leiden University.
- Choe, Jae W. 1987. LF movement and pied-piping. *Linguistic Inquiry* 18.348–353.
- Chomsky, Noam. 1991. Some notes on economy of derivation and representation. *Principles and parameters in comparative grammar*, ed. by Robert Freidin, 417–454. Cambridge, Mass: MIT Press.
- . 1995. *The Minimalist Program*. Cambridge, Mass: MIT Press.
- Cole, Peter, and Gabriela Hermon. 1994. Is there LF movement? *Linguistic Inquiry* 25.239–263.
- Dayal, Veneeta. 2005. Multiple Wh-Questions. *The Blackwell Companion to Syntax*, ed. by Martin Everaert and Henk C. van Riemsdijk, 275–326. Oxford: Blackwell.
- Fiengo, Robert, C. T. James Huang, Howard Lasnik, and Tanya Reinhart. 1988. The syntax of wh-in-situ. Paper presented at the West Coast Conference on Formal Linguistics 7. 81–98.
- Fox, Danny, and David, Pesetsky. 2005. Cyclic linearization of syntactic structure. *Theoretical Linguistics* 31.1–45.
- Grimshaw, Jane. 1977. *English Wh-Constructions and the Theory of Grammar*. Amherst: University of Massachusetts, PhD dissertation.
- . 1979. Complement Selection and the Lexicon. *Linguistic Inquiry* 10.279–426.
- Guerzoni, Elena. 2006. Intervention effects on NPIs and feature movement: towards a unified account of intervention. *Natural Language Semantics* 14.359–398.
- Hagstrom, Paul. 1998. *Decomposing questions*. MIT, PhD dissertation.
- Heim, Irene. 1982. *Semantics of definite and indefinite noun phrases*. Amherst: University of Massachusetts, PhD dissertation.
- Higginbotham, James, and Robert May. 1981. Questions, quantifiers and crossing. *The Linguistic Review* 1.41–79.
- Hoji, Hajime. 1985. *Logical Form Constraints and Configurational Structures in Japanese*. Doctoral dissertation, University of Washington.
- Hornstein, Norbert. 1995. *Logical Form: from GB to Minimalism*. Cambridge, Mass: Blackwell Publishers.
- Huang, C.-T. James. 1982. *Logical Relations in Chinese and the Theory of Grammar*. MIT, PhD dissertation.
- . 1995. Logical Form. *Government and Binding Theory and the Minimalist Program*, ed. by Gert Webelhuth, 125–175. Cambridge, Mass: Blackwell Publishers.
- Kayne, Richard S. 1998. Overt vs. covert movement. *Syntax* 1.128–191.
- Kim, Shin-Sook. 2002. Focus matters: two types of intervention effects. Paper presented at WCCFL 21, Santa Cruz.
- Kishimoto, Hideki. 2005. Wh-in-situ and movement in Sinhala questions. *Natural Language and Linguistic Theory* 23.1–51.
- Kuroda, Sige-Yuki. 1965. *Generative grammatical studies in the Japanese language*. MIT, PhD dissertation.
- Lahiri, Utpal. 1991. *Embedded interrogatives and predicates that embed them*. MIT, PhD dissertation.
- . 2002. *Questions and answers in embedded contexts*. Oxford: Oxford University Press.
- Lasnik, Howard, and Mamoru Saito. 1992. *Move a, Conditions on its application and output*. Cambridge, Mass: MIT Press.
- Lewis, David. 1975. Adverbs of quantification. *Formal Semantics of Natural Language*, ed. by Ed Keenan, 3–15. Cambridge: Cambridge University Press.
- Li, Boya. 2006. *Chinese final particles and the syntax of the periphery*. Leiden University, PhD dissertation.
- Lin, Jo-Wang. 1998. Distributivity in Chinese and its implications. *Natural Language Semantics* 6.201–243.

- Longobardi, Giuseppe. 1991. In defense of the correspondence hypothesis: island effects and parasitic gap constructions in Logical Form. Logical structure and linguistic structure, ed. by C.T. James Huang and Robert May, 149–196. Dordrecht: Kluwer Publishers.
- Munaro, Nicola, Cecilia Poletto and Jean-Yves Pollock. 2001. *Eppur si muove!* On comparing French and Bellunese Wh-movement. University of Padua and Université de Picardie à Amiens.
- Nishigauchi, Taisuke. 1986. Quantification in syntax. Amherst: University of Massachusetts, PhD dissertation.
- Nissenbaum, Jonathan W. 2000. Investigations of Covert Phrase Movement. MIT, PhD dissertation.
- Pesetsky, David. 1982. Path and Categories. MIT, PhD dissertation.
- . 1987. Wh in situ: Movement and unselective binding. Representation of (In)definiteness, ed. by Eric Reuland and Alice Ter Meulen, 98–129. Cambridge, Mass: MIT Press.
- . 2000. Phrasal movement and its kin. Cambridge, Mass: MIT Press.
- Reinhart, Tanya. 1991. Elliptic conjunctions: nonquantificational LF. The Chomskyan Turn, ed. by Asa Kasher, 360–384. Oxford: Blackwell.
- . 1998. Wh-in-situ in the Framework of the Minimalist Program. *Natural Language Semantics* 6.29–56.
- Reintges, Chris H., Philip LeSourd, and Sandra Chung. 2006. Movement, wh-agreement and apparent wh-in-situ. Wh-movement moving on, ed. by Lisa L.-S. Cheng and Norbert Corver, 165–194. Cambridge: MIT Press.
- Simpson, Andrew. 1995. Wh-movement, licensing and the locality of feature checking. SOAS, PhD dissertation.
- . 2000. Wh-movement and the theory of feature-checking. Amsterdam: John Benjamins.
- Simpson, Andrew, and Bhattacharya, Tanmoy. 2003. Obligatory overt wh-movement in a wh-in-situ language. *Linguistic Inquiry* 34.127–142.
- Soh, Hooi Ling. 2005. Wh-in-situ in Mandarin Chinese. *Linguistic Inquiry* 36.143–155.
- Sternefeld, Wolfgang. 2002. Wh-expletives and partial wh-movement: two non-existing concepts? Issues in formal German(ic) Typology, ed. by W. Abraham and C. J.-W. Zwart, 285–305. Amsterdam: John Benjamins.
- Tanaka, Hidekazu. 1997. Invisible movement in Saka-nai and the Linear Crossing Constraint. *Journal of East Asian Linguistics* 6.143–188.
- . 2003. Remarks on Beck's effects: linearity in syntax. *Linguistic Inquiry* 34.314–323.
- Tomioka, Satoshi. 2007. Pragmatics of LF intervention effects: Japanese and Korean Wh-interrogatives. *Journal of Pragmatics* 39.1570–1590.
- Tonoike, Shigeo. 1992. Operator movements in Japanese. *Meiji Gakuin Ronsoo* 84.79–142.
- Tsai, Wei-Tien Dylan. 1994. On nominal islands and LF extractions in Chinese. *Natural Language and Linguistic Theory* 12.121–175.
- Vallduví, Enric. 1992. The information component. University of Pennsylvania, PhD Dissertation dissertation.
- . 1995. Structural properties of information packaging in Catalan. Discourse configurational languages, ed. by K. E. Kiss, 122–153. New York: Oxford University Press.
- von Stechow, Arnim. 1996. Against LF pied-piping. *Natural Language Semantics* 4.57–110.
- Wahba, Wafaa A. B. 1991. LF movement in Iraqi Arabic. Logical structure and linguistic structure, ed. by C.T. James Huang and Robert May, 253–276. Dordrecht: Kluwer Publishers.
- Watanabe, Akira. 1992. Subjacency and S-structure movement of wh-in-situ. *Journal of East Asian Linguistics* 1.255–291.
- . 2001. Wh-in-situ languages. The Handbook of Contemporary Syntactic Theory, ed. by Mark Baltin and Chris Collins, 203–225. Oxford: Blackwell Publishers.