

Wh-Scoping in Syntactic *Wh*-Fronting Languages*

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This paper examines various types of syntactic *wh*-fronting languages in order to offer a non-derivational account of *wh*-scoping in these languages. While English is commonly regarded as a typical *wh*-fronting language, it also exhibits an in-situ type of non-reprise *wh*-questions, which we analyze as a subtype of *interrogative clause* that does not involve an unmotivated unary branching structure. The subtype *in-situ-wh-int-cl* that we posit for English is also useful for the account of in-situ questions in 'optional *wh*-fronting languages' like French and Iraqi Arabic. While both fronting and in-situ patterns are available in these languages, they exhibit different restrictions on in-situ *wh*-question formation. This paper discusses what constraints are responsible for the language-particular differences on the distributions of in-situ *wh*-phrases. It also provides a comparison with the *wh*-scoping patterns in multiple *wh*-fronting languages, with the discussion of some typological implications.

Key words: *wh*-interrogatives, *wh*-scope, *wh*-fronting, in-situ *wh*-phrases, in-situ *wh*-questions, optional *wh*-fronting, multiple *wh*-fronting

1. Introduction

This paper investigates diverse types of syntactic *wh*-fronting languages and examines how various *wh*-scoping patterns can be accounted for within a non-derivational theory of *wh*-interrogatives. To achieve this goal, we first look into English *wh*-interrogatives to find out what types of clauses can be used as *wh*-interrogatives and what mechanisms are employed for scoping of *wh*-operators. In addition to the much discussed pattern of *wh*-interrogatives involving (single) *wh*-fronting as in (1a), this paper deals

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with non-echo in-situ *wh*-interrogatives such as (1b) that receive the same *wh*-question interpretations as ordinary *wh*-questions.

- (1) a. Which restaurant do you recommend?
 b. You recommend WHICH RESTAURANT?

After pointing out problems with previous approaches that either disregard in-situ *wh*-questions in English or analyze their structures in an unmotivated way, this paper will propose an analysis in which non-echo in-situ questions as well as ordinary *wh*-questions are treated in terms of independent clause types. Contrary to previous non-derivational analyses (cf. Ginzburg & Sag, 2000), the proposed account does not employ an unmotivated unary branching structure in the analysis of non-echo in-situ *wh*-questions.

Co-existence of fronting and in-situ patterns is much more well-attested in so-called optional *wh*-fronting languages. Based on French and Iraqi Arabic examples, we will argue that the optional *wh*-fronting behavior in these languages can be explained in the essentially same way as in English. In other words, both the fronting and in-situ types of *wh*-interrogative clauses are available in these languages as well. Although French and Iraqi Arabic employ the same mechanism for type classification and *wh*-scoping, they exhibit different restrictions on in-situ *wh*-question formation. We will show that such language-particular differences can be accounted for in terms of lexically stated constraints.

For a comparison with (single) *wh*-fronting languages and optional *wh*-fronting languages, this paper also discusses the basic pattern of multiple *wh*-fronting languages. In languages such as Bulgarian and Romanian, all *wh*-phrases are required to appear at the beginning of clauses, whereas in languages like Romani and Serbo-Croatian, multiple *wh*-fronting is possible, but not required as long as one *wh*-phrase is fronted. We will examine what constraint(s) are responsible for these multiple *wh*-fronting patterns, and discuss some typological implications of these patterns.

From a cross-linguistic perspective, we will argue that English and optional *wh*-fronting languages behave alike in that they employ both fronting and in-situ strategies. Therefore, these languages contrast with both *wh*-in-situ languages such as Chinese that permit only in-situ strategy and multiple *wh*-fronting languages that always involve *wh*-fronting for genuine constituent questions. Furthermore, we will show that the proposed analysis of in-situ *wh*-questions in English provides a basis for a unified account of in-situ

wh-questions across languages.

2. Distribution and Scoping of Wh-Phrases in English

2.1 Wh-Scoping in English

It is well known that an English interrogative clause is formed by single *wh*-fronting. Thus when a multiple question is formed, *wh*-phrases other than the initial one must remain in situ.

- (2) a. What did the customer buy?
b. I wonder what the customer bought.
- (3) a. Which student bought which book?
b. *Which student, which book bought?
- (4) a. I wonder who bought what.
b. *I wonder who what bought.

The distribution of *wh*-interrogatives in embedded clauses is determined by the semantic selection of the matrix verb.

- (5) a. *John asked/wondered that the customer bought a camera.
b. John asked/wondered what the customer bought.
- (6) a. John remembers/knows that the customer bought a camera.
b. John remembers/knows what the customer bought.
- (7) a. John believes/thinks that the customer bought a camera.
b. *John believes/thinks what the customer bought.

Within the framework of Head-Driven Phrase Structure Grammar (HPSG), this can be accounted for by assuming that question-selecting verbs such as *ask* and *wonder* have subcategorization information in (8), whereas proposition-selecting verbs such as *believe* and *think* are specified as in (9). Verbs like *remember* and *know* allow both specifications.

(8) [COMPS < S: [MODE *question*] >]

(9) [COMPS < S: [MODE *proposition*] >]

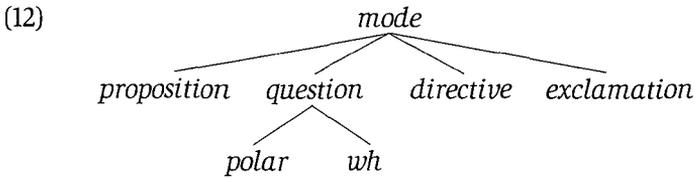
Following Pollard and Yoo (1998, PY hereafter) and Yoo (1997), we assume that interrogative scope of a *wh*-phrase is determined by the storage and retrieval of the *wh*-operator associated with a *wh*-phrase. In order to distinguish the semantic properties of *wh*-operators from those of ordinary quantifiers, we assume that the CONT(ENT) of *wh*-operators is of sort *param(eters)*, following Ginzburg and Sag (2000, GS hereafter). This parameter information is stored in the QSTORE and WH of a *wh*-phrase. Thus *wh*-phrases like *who* can be described as in (10). The WH feature in (10) plays the same role of specifying a *wh*-constituent as the QUE feature in PY and Yoo (1997).

(10)
$$\left[\begin{array}{l} \text{synsem} \\ \text{LOC} \left[\begin{array}{l} \text{CONT } [2] \\ \text{QSTORE } \{ [2] \left[\begin{array}{l} \text{param} \\ \text{INDEX } i \\ \text{RESTR } \{ \text{person}(i) \} \} \end{array} \right] \} \\ \text{WH } [2] \end{array} \right] \end{array} \right]$$

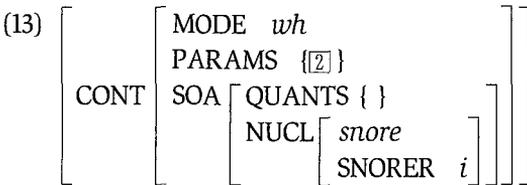
As in PY, given a lexical head, the QSTORE values of all ‘selected arguments’ are ‘amalgamated’ by the head. However, our analysis diverges from PY, in that, in accordance with GS, retrieved *wh*-operators appear in the PARAM(ETER)S, rather than in the QUANTS. The general architecture of the CONT can be represented as in (11):

(11)
$$\left[\begin{array}{l} \text{CONT} \left[\begin{array}{l} \text{MODE } \textit{mode} \\ \text{PARAMS } \textit{set(parameters)} \\ \text{SOA} \left[\begin{array}{l} \textit{psoa} \\ \text{QUANTS } \textit{list(quantifiers)} \\ \text{NUCL } \textit{q(quantifier)f(ree)psoa} \end{array} \right] \end{array} \right] \end{array} \right]$$

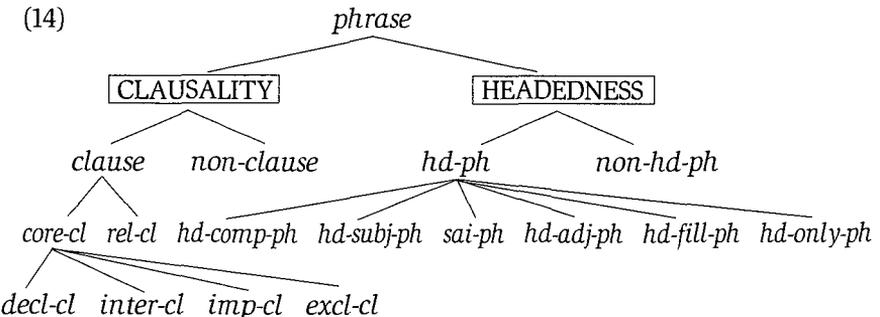
We propose the following type hierarchy for the MODE value:



Accordingly, the CONT of the *wh*-question *Who snores?* is analyzed as in (13), in which the tag [2] indicates the *param* described in (10).

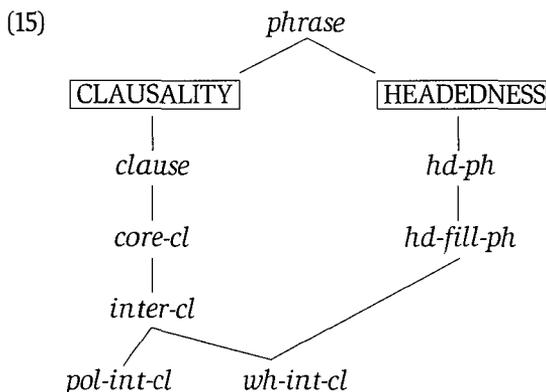


In the analysis of interrogatives, it is very useful to posit an interrogative clause as a subtype of *clause*, because interrogative clauses, as well as other types of clauses, are subject to their own syntactic or semantic constraints. Diverging from Kathol (1995) and Yoo (1997) that assume that different types of clause are subtypes of construction that are cross-classified with the standard word/phrase distinction of *sign*, we employ a more wide-spread view of Sag (1997) that each phrasal type inherits from a CLAUSALITY type and a HEADEDNESS type.



In (14), *inter(rogative)-cl(ause)* is introduced as a subtype of *core-cl(ause)*. Following Ginzburg and Sag (2000), we further posit *pol-int-cl* and *wh-int-cl* as subtypes of *inter-cl*, the type *wh-int-cl* being identified as a

subtype of *hd-fill-ph*.^{1) 2)}



Therefore, the ordinary *wh*-questions in (2a) and (3a) belong to the type *wh-int-cl*.

Now we will consider what constraints operate on the types *inter-cl* and *wh-int-cl* in English. Interrogative clauses are distinguished from other clauses in terms of the CONT value. This is stated in the following constraint:

- (16) *inter-cl*:
 [CONT]MODE *question*] → ...

Since *wh*-interrogatives contain a *wh*-operator in its PARAMS, the retrieval of *wh*-operator must be ensured. Following Yoo (1997), we assume that unlike ordinary quantifier retrieval, *wh*-retrieval should be limited to a phrasal node. Accordingly, the following constraint is posited for *wh*-retrieval.³⁾

(17) *Wh*-Retrieval Constraint

In an *inter-cl*, the PARAMS value forms a subset of the QSTORE of the head daughter; and the QSTORE value is the relative complement of that set.

1) We have not included in-situ *wh*-questions, which will be discussed in Section 2.2 and 3.1.

2) The type *hd-fill-ph* defines a construction which consists of an extracted element (i.e., the filler) and a sentence that contains a missing element corresponding to the filler. See GS (2000, p. 174) for the precise type constraint.

3) The constraint (17) is based on Pollard and Sag's (1994) mechanism of quantifier retrieval, and incorporates PY's (1998) proposal on the retrieval of lexically amalgamated QSTORE values. It has the same content as GS's (2000, p. 227) Interrogative Retrieval Constraint.

The constraint (17) tells us where the PARAMS value comes from, but does not precisely specify the syntactic environment where such retrieval can occur. Consequently, nothing can rule out ungrammatical cases like (18) so far.

(18) *What did Mary wonder the customer bought?

This is because the *wh*-operator associated with *what* is stored in the QSTORE of the embedded verb, and then can be retrieved at the embedded clause, producing the interpretation ‘Mary wondered what the customer bought.’ Thus without an additional constraint, *wh*-operators can be retrieved even at a clause that does not contain a *wh*-phrase.

A similar problem occurs in (19), in which (19b) cannot be interpreted as the same question as (19a).

- (19) a. Which reviewer wonders which article Mary reviewed?
 b. *Which reviewer wonders Mary reviewed which article?

Further, in (20a,b) the embedded clause can be interpreted only as an indirect question, although, in principle, *remember* can take either a question or a proposition.

- (20) a. Mary remembers what John bought.
 b. Does Mary remember what John bought?

The fact that *what* in (20a,b) cannot take matrix scope, yielding the reading ‘What does Mary remember that John bought?’, suggests that a *wh*-interrogative clause is possible only when it contains a fronted *wh*-phrase.

The generalization that we can draw from the above examples is that in order for a clause to be interpreted as a *wh-int-cl*, it must include an initial *wh*-phrase. In other words, the fronted position of a *wh*-phrase indicates its scope in English. Thus the following constraint is posited as a licensing constraint on *wh*-retrieval.⁴⁾

4) This constraint, which incorporates PY’s (1998) idea of the Syntactic Licensing Constraint on *Wh*-Retrieval, has the same content as GS’s (2000, p. 228) Filler Inclusion Constraint.

(21) Licensing Constraint on *Wh*-Retrieval

In a *wh-int-cl*, the PARAMS value must include the nonempty WH value of the filler daughter.

The constraint (21) can also explain why the embedded *wh*-phrase in (22) cannot take matrix scope, yielding the *wh*-question interpretation ‘What did Mary think the customer bought?’.

(22) *Did Mary think what the customer bought?

In (22), the *wh*-phrase cannot be scoped at the embedded clause either, because, although it qualifies as a *wh-int-cl* in accordance with (21), it does not satisfy the subcategorization restriction of the matrix verb *think*, which takes only declarative complements.

Now consider the contrast in (23):

- (23) a. Which reviewer thinks Mary will review which article?
 b. *Which reviewer thinks which article Mary will review?

Unlike in (22), (23b) does not violate the constraint in (21), because the matrix clause contains the initial *wh*-phrase. Yet the sentence is ungrammatical. This can be accounted for by the interaction between clausal type constraints and subcategorization information of the matrix verb. If the embedded *wh*-phrase scoped at the matrix clause, the embedded clause would be a declarative clause. However, this is not possible, as ordinary declarative clause (i.e., *decl-cl*) is a subtype of *hd-subj-ph* (GS, p. 42) and no declarative clause belongs to *hd-filler-ph*. Moreover, the embedded clause in (23b) cannot be a *wh-int-cl* due to the matrix verb’s requirement on its complement.

Another fact that we should account for is that English does not allow more than one *wh*-filler in a clause. Thus multiple *wh*-fronting as in (24) is not permitted.

(24) *Which book, to whom did Mary give?

We propose that single *wh*-movement languages like English are subject to the following constraint:

(25) Single *Wh*-Fronting Constraint

In a *wh-int-cl*, only one member in the PARAMS may appear as the WH member of a filler daughter of some projection that has the same SOA value as this clause.

We should note that the constraint (25) involves non-locality in that the lower nodes as well as the daughter nodes of a *wh-int-cl* are also taken into account. While it will be possible to make the constraint local if we permit *wh*-retrieval at each of the *hd-filler-ph* nodes, this seems to be the price that we pay when we allow the *wh*-operators to be retrieved only at the top node of a *wh-int-cl*.⁵ Now, given the constraint in (25), the root clause in (24) is not licensed, because both the two PARAMS elements, one from *which book* and the other from *to whom*, appear as the WH value within the clause.

To sum up, in addition to the universal constraint on *wh*-retrieval in (17) and (21), English is subject to (25) due to its single *wh*-movement property.

2.2. Non-Repeat In-Situ *Wh*-Questions in English

Although the most common type of *wh*-questions in English accompanies fronting of a *wh*-phrase, it should be also recognized that there is another type of *wh*-questions like (26) that only involves *wh*-in-situ.

(26) Jessica met WHOM?

GS (2000) discuss that there are two different uses of in-situ *wh*-sentences, repeat uses and non-repeat uses. The term 'repeat' is adopted to cover questions whose meaning is partially dependent on the immediately preceding utterance, and is further divided into two categories, i.e., echo questions such as (27) and 'reference questions' such as (28).

(27) A: Repcartiman Pigaloxido failed in the exam.

B: Who failed in the exam?

5) As Przepiórkowski (1998) proposes for his *wh*-retrieval constraint, this kind of global constraint can be formalized in HPSC.

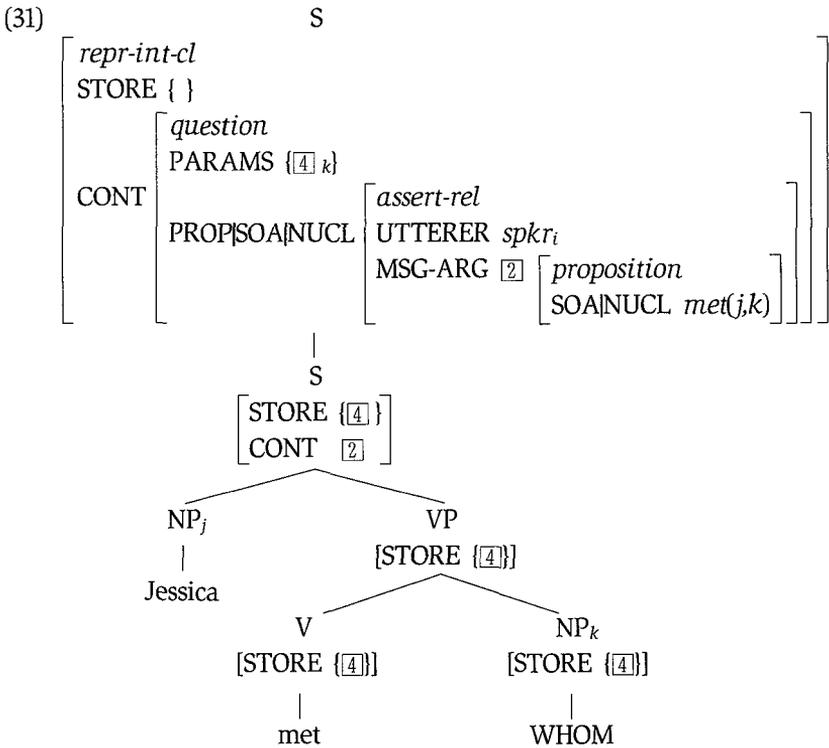
- (28) A: They like to meet Reppartiman Pigaloxido again.
 B: Who like to meet Repparitiman Pigaloxido again?

Echo questions arise from mishearing part of prior utterance and marked by a special intonation pattern (i.e., rise with spreading high tone). On the other hand, reference questions ask for clarification of the reference of some expression in the previous utterance, involving a characteristic intonation pattern (i.e., fall with spreading low tone).

In contrast to previous views that reprise uses are metalinguistic (cf. Cooper, 1983; Engdahl, 1986), or intrinsically different from genuine questions in their logical forms (cf. Janda, 1985), GS claim that reprise uses are analyzed grammatically in the way as non-reprise uses are. Their account of the semantics of reprise uses is based on the fact that reprise questions can be paraphrased by ordinary questions. The following examples are from GS (2000, p. 259).

- (29) a. You like WHO?
 b. Who did you say (just now) that you like?
- (30) a. Who likes WHICH MOVIE?
 b. (?)Which movie did you (just now) ask me who likes?

In GS's analysis, the paraphrases in (b) sentences are regarded as the content of the reprise. Constructionally, reprise *wh*-interrogatives are analyzed as instances of a type *repr(ise)-int(errogative)-cl(ause)*, which is a subtype of *i(n)s(itu)-int(errogative)-cl(ause)*. In GS, the example in (26) is analyzed as in (31).



In (31), *reprise-int-cl* is represented as a ‘converted’ form of the declarative clause, the main difference being the CONT values. The CONT value of the root S corresponds to the question ‘Who did you say that Jessica met?’

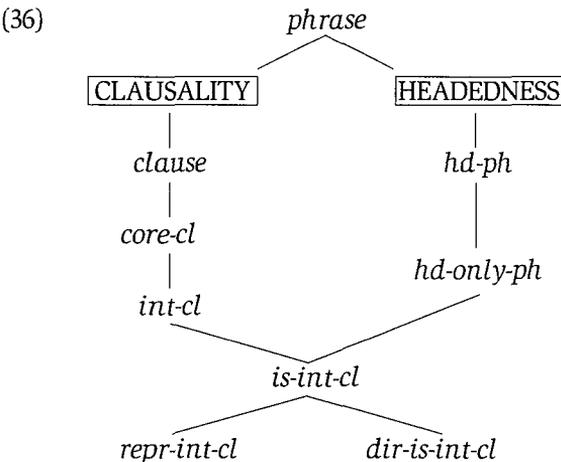
What we are more interested in is another type of in-situ interrogatives, i.e., non-reprise uses of in-situ *wh*-sentences. Following Bolinger (1978), GS argue that in-situ questions such as (26) may have a non-reprise, true question reading as well as reprise interpretation. According to GS, although ‘direct’ in-situ questions require certain presuppositions whose nature is difficult to characterize, they can be used as content questions when such pragmatic conditions are satisfied. The following sentences (32-34) from GS and (35) from Bolinger (1978) exemplify this.

- (32) a. A: Well, anyway, I’m leaving.
 B: OK, so you’ll be leaving WHEN exactly?
- b. A: I’m annoyed.
 B: Aha. You’re annoyed with WHOM?

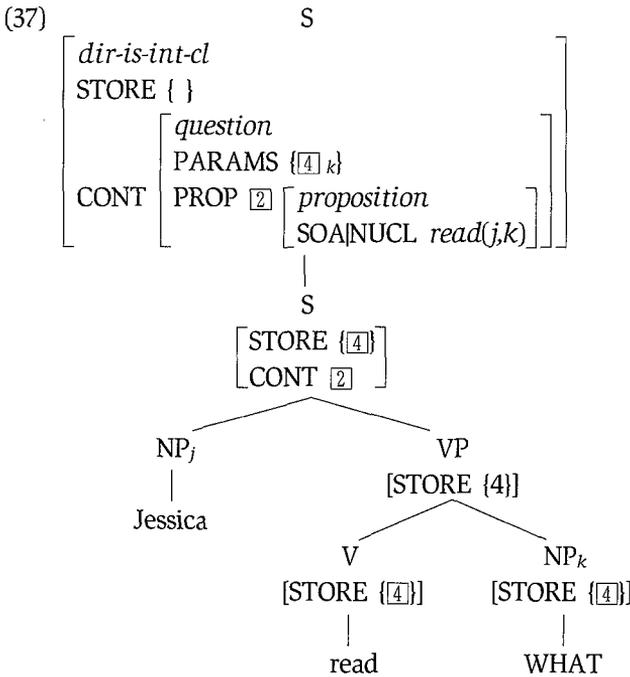
- (33) Michael Kransy [addressing a guest—WHO HAS NOT SAID ANYTHING YET—about the interim chief of the US Attorney’s office]:
 This is a position that is HOW IMPORTANT in your judgment, Rory?
 [Forum KQED—July 29, 1998]
- (34) Lester: I’ve been working here for 14 years. You’ve been here for
 HOW LONG? A month? [from the movie *American Beauty*]
- (35) A [Post-maritally blissful speaker]: We’re going to buy a house.
 B [Skeptical in-law]: Uh huh. And you’re going to pay for it with
 WHAT?

In the examples (32) and (35), it is not the case B has not fully understood A’s utterance. Based on the content of the prior utterance, B wants to receive a more specific piece of information that A has not provided yet. Moreover, as examples like (33) illustrate, in-situ *wh*-questions can be used even without prior linguistic context.

Citing various felicitous examples of non-reprise in-situ *wh*-interrogatives, GS argue that it is false to state that English *wh*-interrogatives must involve fronting of a *wh*-phrase. In GS’s view, in-situ *wh*-interrogatives are simply another type of *wh*-question, although they show limited occurrences due to certain presuppositional factors. In GS non-reprise uses of *wh*-interrogatives are analyzed as instances of the type *direct-in-situ-interrogative-clause* (*dir-is-int-cl*), which is a subtype of *is-int-cl*.



GS's analysis of the sentence "Jessica read WHAT?" is given in the following:



As the hierarchy in (36) entails, *dir-is-int-cl* is analyzed parallel to *repr-is-int-cl*, both being subtypes of *is-int-cl*.

In Section 3.1, we will provide a different analysis of direct in-situ interrogatives. However, we agree with GS in the respect that in-situ *wh*-questions exist as a type of *wh*-interrogatives in English. In other words, English basically have two different strategies for content question formation, although the in-situ strategy is subject to a presupposition of a particular kind.

While exploring the account of reprise uses is also intriguing, we think that they are still needed to be distinguished from non-reprise uses of in-situ *wh*-interrogatives whose content can be analyzed essentially the same as that of ordinary *wh*-interrogatives. Therefore, we will focus on the non-reprise uses in this paper, and the term ‘in-situ *wh*-questions’ will refer to only non-reprise uses unless mentioned otherwise. Our analysis of in-situ *wh*-questions will be discussed in Section 3.

3. An Analysis of In-Situ *Wh*-Questions

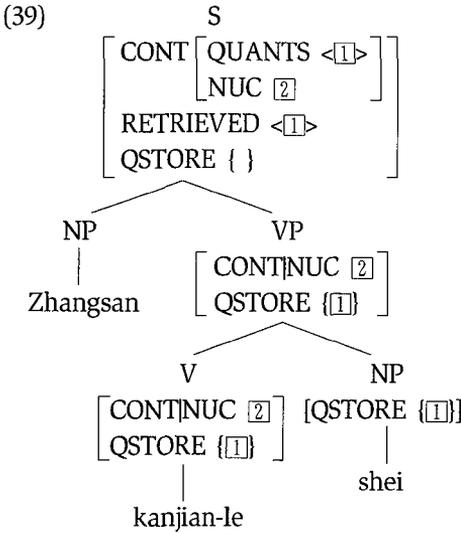
3.1. English

We have seen that although non-reprise uses and reprise uses may have the same form, their interpretations are radically different. As discussed in 2.2, in GS, both uses are represented by the same type *is-int-cl*, which is a subtype of *head-only-phrase* (*hd-only-ph*). However, while the unary branching structure for reprise uses as in (31) seems unavoidable considering its complex interpretation involving the illocutionary relation of the previous utterance, the structure in (37) for non-reprise uses seems unnecessarily complicated, because the only difference between the root S and its head S is the retrieval of the PARAMS value. Given that non-reprise in-situ interrogatives have the same interpretations as ordinary interrogatives, we can pursue an alternative analysis of in-situ questions that does not involve an unmotivated structure as in (37).

Another reason for questioning the unary branching structure in (37) is concerned with a unified account of similar type of questions in other languages. In-situ *wh*-questions are very common across languages. As will be shown in 3.2, languages like French and Iraqi Arabic employ an in-situ strategy more rigorously than English, in addition to the *wh*-fronting strategy. Further, many languages such as Korean, Japanese, and Chinese employ only the in-situ strategy. From a cross-linguistic perspective, then, a natural question to ask is whether in-situ questions in other languages are also represented via a complicated structure like (37).

Yoo (1997) argues that the scoping mechanism of *wh*-phrases in *wh*-in-situ languages like Chinese is essentially the same as that of quantifiers, and does not necessitate any syntactic licensing condition. Accordingly, in Yoo, the following Chinese example in (38) is analyzed as in (39).

- (38) Zhangsan kanjian-le shei?
 Zhangsan see-ASP who
 'Who did Zhangsan see?'



In (39), the inherited QSTORE value is retrieved at the matrix clause, yielding an interrogative interpretation with the CONT value [MODE *wh*].

We propose that essentially the same kind of mechanism can be adopted for the account of in-situ *wh*-questions in *wh*-fronting languages. Once a *wh*-operator is stored, it can be inherited into the matrix S. If the matrix S does not satisfy the licensing condition in (21), it cannot be analyzed as an instance of *wh-int-cl*. However, no quantifiers and operators can be left unretrieved at the root clause level, because we assume that the following implicational constraint is imposed on a root clause.^{6) 7)}

(40) [ROOT +] ⇒ [QSTORE { }]

In a sentence like (26), which is repeated in (41), the matrix S can be considered as an interrogative clause at which the stored *wh*-operator is retrieved.

(41) Jessica met WHOM?

6) The constraint in (40) is interpreted as follows:

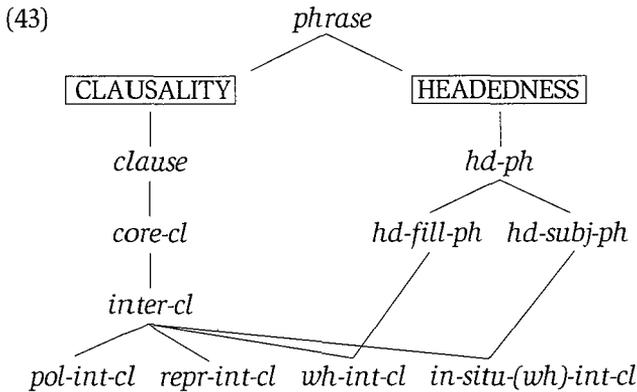
(i) If a sign is [ROOT+], then its QSTORE must be empty.

7) As in GS (2000, p. 267), the feature ROOT is used to distinguish root clauses from other independent clauses.

We propose that *in-situ-wh-int-cl* is analyzed as an instance of *in-situ-wh-int-cl* that is a subtype of a *int-cl*, and is subject to the following constraint in (42).

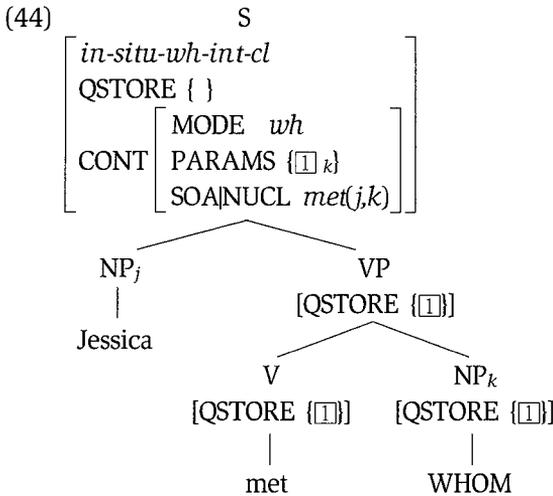
$$(42) \left[\begin{array}{l} \textit{in-situ-wh-int-cl} \\ \text{CAT|HEAD} \left[\begin{array}{l} \text{IC+} \\ \text{VFORM } \textit{fin} \end{array} \right] \\ \text{QSTORE } \Sigma \end{array} \right] \rightarrow \dots \mathbf{H} [\text{QSTORE} \neq \Sigma]$$

Crucially, we propose that *in-situ-wh-int-cl* is a subtype of a *hd-subj-ph*.



Our account is based on the general quantifier storage mechanism. Given a stored parameter that originates from an *in-situ wh*-phrase, there are two ways that it can be retrieved. One is to satisfy the licensing constraint in (21) in order to be an instance of *wh-int-cl*. In this case, there must be a clause initial *wh*-phrase. Otherwise, the unretrieved *wh*-operator is retrieved at the [IC+] clause, satisfying the constraint (42) on *in-situ-wh-int-cl*. This is forced by the constraint in (40), which prohibits a root clause from having unretrieved quantifiers or operators. Since *in-situ-wh-int-cl* is a subtype of *inter-cl*, by the *Wh*-Retrieval Constraint in (17), the retrieved value appears in the PARAMS value of the clause.

Our analysis of the example in (41) is illustrated in (44).



Since the type *in-situ-wh-int-cl* is a subtype of *hd-subj-ph*, we can explain why the following sentences are not acceptable as non-reprise in-situ questions:

- (45) a. Give WHO the book? (only for a reprise use)
- b. Do I like WHO? (only for a reprise use)
- c. What a winner WHO is? (only for a reprise use)

All the examples in (45) does not satisfy the constraint on *in-situ-wh-int-cl*, because the clause does not constitute a *hd-subj-ph* in its top node.

Meanwhile, the non-reprise use of the following sentences is predicted in our analysis, because *in-situ-wh-int-cl* can be formed before it combines with a topicalized element.

(46) The CDs, you gave to WHO?

(47) A: I'm going to send the sourdough bread to the Southern Bakery, and the croissants to Barringers.

B: I see, and *the bagels you're going to send WHERE?* (GS, 2000, p. 280)

On the other hand, nothing hinders the matrix clause of the following example from being analyzed as an instance of *in-situ-wh-int-cl*. This is because the parameter originated from the *wh*-phrase can be inherited into the matrix clause, so that it can be retrieved at the root clause.

(50) Merle assumes Brendan saw WHAT? (GS, 2000, p. 284)

As exhibited in the proposed type hierarchy in (43), in our analysis, reprise questions and non-reprise in-situ questions do not constitute a subtype of *interrogative clause*. While GS posit a separate type *is-int-cl* to cover the two types of in-situ questions under the assumption that both types of questions can be represented as a *hd-only-phrase*, once they are analyzed in terms of different phrasal types, there is no a priori reason why they should form a subtype. Actually, in addition to their distinct semantic representations, they demonstrate differences in syntactic distributions, since non-reprise in-situ questions cannot be formed in a non-declarative form of sentences as in (30a) and (45a-c).⁹⁾

In the following section, we will discuss how the analysis of English in-situ questions can be adopted and extended for the account of so called optional *wh*-fronting languages.

3.2. In-Situ Questions in Optional Wh-Fronting Languages

It is well known that in languages like French, displacement of a *wh*-phrase is only optional in the formation of matrix questions. This type of language is often referred to as ‘optional *wh*-movement languages’ in that it exhibits combining properties of English and Chinese *wh*-questions. The following examples from Rizzi (1991) illustrate this:

- (51) a. Elle a rencontré qui?
 ‘(Lit.) She has met who?’
 b. Qui a-t-elle rencontré?
 ‘Who has she met?’

9) In this connection, it is worth noting that reprise questions are not always expressed by the in-situ pattern cross-linguistically. As GS (2000, p. 271) illustrate, in Mandarin, while non-reprise questions exhibit the in-situ pattern, reprise questions can be formed with a fronted *wh*-phrase.

The same variability is observed in long distance questions as in (52), and in multiple *wh*-questions in (53).

- (52) a. Où veux-tu l'accrocher?
 where want you it to approach
 'Where do you want to hang it?'
 b. Tu veux l'accrocher où?
 you want it to attach where (Plunkett, 2000, pp. 511-512)

- (53) a. Qu' as-tu donné à qui?
 what have you given to whom
 b. Tu as donné quoi à qui?
 You have given what to whom (Ackema & Neelman, 1998, p. 482)

Iraqi Arabic is another language exhibiting the option of *wh*-fronting. It is shown in the following examples from Wahba (1991).

- (54) a. Meno Mona shaafat?
 who Mona saw
 'Who did Mona see?'
 b. Mona shaafat meno?
 Mona saw whom
- (55) a. Weyya meno Mona xarjat?
 With whom Mona left
 'With whom did Mona leave?'
 b. Mona xarjat weyya meno?
 Mona left with whom

The existence of the French/Iraqi Arabic pattern has raised some controversies with respect to typology and the account of optionality. Above all, this pattern raises a problem to Cheng's (1991) view that an interrogative clause is typed either by fronting of a *wh*-phrase or through a (possibly null) question particle. Cheng's Clausal Typing Hypothesis, when combined with the Principle of Economy of Derivation, predicts that no language has the option of using either a *wh*-particle or syntactic *wh*-movement of *wh*-words to type a sentence as a *wh*-question. Since French employs *wh*-fronting and does not have a question particle, it is not explained how

in-situ *wh*-questions are permitted in French.¹⁰⁾

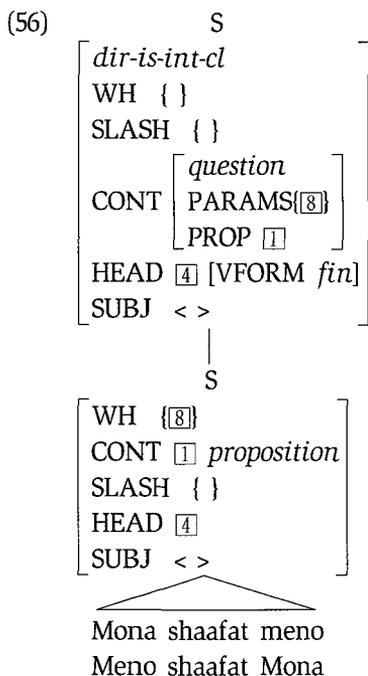
There have been diverse perspectives on French or Iraqi Arabic type languages. The most common view is to recognize mixed languages as a separate type that exhibits both patterns of English and Chinese. In particular, distinguishing the French pattern from both English and Chinese ones, Bošković (2000) offers a minimalist account of French, taking into account a rather limited in-situ pattern in French.

Johnson and Lappin's (1997) analysis is also based on the view that Iraqi Arabic employs both fronting and in-situ strategies in *wh*-question formation. Couched in the framework of HPSG, Johnson and Lappin propose that a *wh*-complementizer Q, which may be phonologically null, appear in C and that languages differ in the lexical information of the *wh*-complementizer with respect to SUBCAT and NONLOCAL values (in particular, SLASH and QUE values). In their analysis, Iraqi Arabic has a double lexical entry of the *wh*-complementizer, which leads to two different patterns of *wh*-questions.

GS (2000) are sympathetic to Johnson and Lappin's (1999) analysis which, building upon Johnson and Lappin (1997), proposes two distinct types of *wh*-clauses. Adopting Johnson and Lappin's (1999) assumption that a non-empty WH value can be inherited into a VP or S, GS provide a way of collapsing both cases (i.e., with or without *wh*-fronting) into a single construction, in terms of their *dir-is-int-cl*. The following diagram from GS illustrates this:

10) Cheng (1991) argues that languages like Bahasa Indonesia, Egyptian Arabic, and Palauan, which are referred to as optional movement languages, are not counter-examples to the predictions, because the clause-initial *wh*-word in these languages is a base generated *wh*-word in cleft constructions, thus not a fronted constituent resulting from *wh*-movement. However, Cheng (1991) does not discuss how *wh*-in-situ in French is accounted for.

On the other hand, Cheng and Rooryck (2000) claim that (apparent) optionality in French is due to whether or not the yes-no intonation Q morpheme is in the numeration. In particular, the existence of the yes-no morpheme in the numeration results in in-situ *wh*-questions. However, it may still raise a question why French employs the yes-no intonational Q morpheme when it also has the mechanism of overt *wh*-movement. Furthermore, as Cheng and Rooryck note themselves, this line of account leads to a potential problem in languages like Chinese, because it is not clear why Chinese, which involves a question particle for in-situ questions, does not allow for numerations without the question particle, which would result in *wh*-fronting.



While the collapsed construction in (56) looks simpler, a few disadvantages can be pointed out from both cross-linguistic and language-specific perspectives. First, (56) as well as Johnson and Lappin's (1997, 1999) analyses exploit the (nonempty) WH value to indicate a VP or S that qualifies as the head daughter of a *wh*-interrogative clause. In our analysis of *wh*-interrogatives outlined in Section 2, this function is carried out by the QSTORE value containing a nonempty *wh*-operator (or *param*). Therefore, for a unified account of interrogatives, we can make use of the QSTORE, while limiting the role of the WH feature to specify a *wh*-constituent that can appear in the left-periphery of a *wh*-interrogative clause. Second, since both types of *wh*-interrogatives, i.e., with or without *wh*-fronting, are analyzed in terms of *dir-is-int-cl*, it leads to disparities in constructions among languages. That is, the clausal type of Iraqi Arabic interrogatives with *wh*-fronting will be very different from that of other *wh*-fronting languages (e.g., English, German) and the clausal type that in-situ *wh*-interrogatives belong to may look dissimilar from the one in *wh*-in-situ languages (e.g., Chinese, Korean). Although it is absolutely possible for each language to have different clausal constraints, it would be more desirable to have

certain common features in clause types and constraints, unless there are clear reasons why a certain language should be described distinctively. Third, if two types of questions are analyzed in terms of a single construction as in (56), it will be difficult to account for the relatively limited occurrence of in-situ *wh*-questions in Iraqi Arabic. As will be shown shortly (cf. (57-59)), Iraqi Arabic exhibits language-particular constraints on the distribution of in-situ *wh*-phrases. Given a single construction as in (56), the description of the relevant constraints can be much more challenging and complicated.¹¹⁾

In our view, Iraqi Arabic/ French type languages can be dealt with in parallel with English. In other words, these languages can be analyzed as containing both the types *wh-int-cl* and *in-situ-wh-int-cl* as subtypes of *int-cl* (cf. (43)). This view also contrasts with Yoo (1997) that posits a distinct *wh*-retrieval licensing constraint for optional *wh*-movement languages.

Now let us consider further facts on the distribution of *wh*-in-situ in Iraqi Arabic. As Wahba (1991) and Johnson and Lappin (1997) discuss, in Iraqi Arabic, in-situ non-subject *wh*-phrases are not permitted at all in a finite embedded clause (whether it is a question or not), while they can occur in matrix questions and in nonfinite VP complements of a verb. The following examples are from Johnson and Lappin (1997):

- (57) a. *Mona tsawwarat Ali ishtara sheno?
 (Lit.) Mona thought Ali bought what?
 b. Sheno tsawwarat Mona Ali ishtara t?
 what thought Mona Ali bought
 'What did Mona think Ali bought?'

 (58) *Meno tsawwar Ali xaraj weyya meno?
 'Who thought Ali left with whom?'

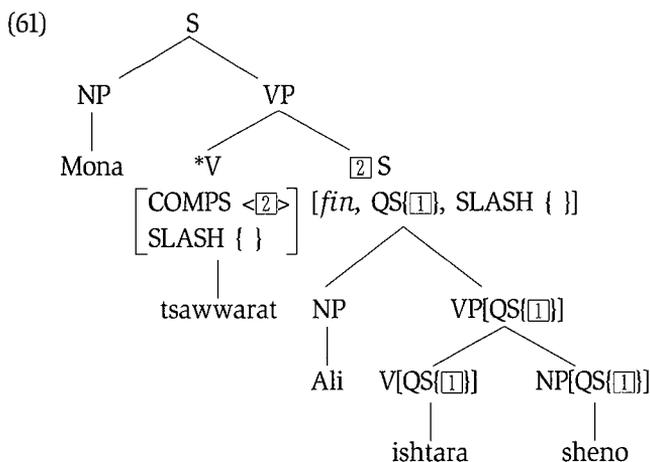
 (59) a. Mona raadat tijbir su'ad tisa'ad meno?
 (Lit.) mona wanted to force Su'ad to help who?
 b. Meno raadat Mona tijbir Su'ad tisa'ad t?
 who wanted Mona to force Su'ad to help
 'Who did Mona want to force Su'ad to help?'

11) GS (2000) deal with only simple cases in Iraqi Arabic, and do not discuss various cases of in-situ questions.

In our analysis, this means that an interrogative operator in the QSTORE can be inherited from a finite embedded clause only when the operator is associated with a displaced *wh*-phrase. This can be stated as the following implicational constraint that applies to verbs with sentential complements in Iraqi Arabic.

- (60) (For Iraqi Arabic verbs with a sentential complement)
 [COMPS < S[*fin*, QS(\square *param*,...)] >] \rightarrow [SLASH {[QS(\square ,...)],...}]

The constraint (60) requires that if a verb takes as its complement a finite clause containing a parameter in its QS(TORE), then its SLASH must contain an element whose QS(TORE) includes the same parameter value. Accordingly, the examples (57a) and (58) are ruled out by (60). The following analysis of (57a) illustrates this:



Although precise patterns are different, in-situ *wh*-questions in French are also restricted in their occurrences. In French, while matrix questions allow the in-situ option, embedded questions do not.

- (62) a. *Je ne sais pas [elle a rencontre qui].
 ‘(Lit.) I don’t know she has met who.’
 b. Je ne sais pas [qui elle a rencontre].
 ‘I don’t know who she has met.’ (Rizzi, 1991)

- (63) a. Pierre a demandé qui tu as vu.
 Pierre has asked whom you have seen
 'Pierre asked who you saw.'
 b. *Pierre a demandé tu as vu qui. (Bošković, 2000, p. 54)

The unacceptable examples (62a) and (63b) are parallel to the ungrammatical English example **Bill wonders Jane likes WHO*. Accordingly they can be accounted for by the type constraint (42) on *in-situ-wh-int-cl*. More specifically, the embedded clauses in (62a) and (63b) cannot be analyzed as in-situ *wh*-questions, because only [IC+] clauses are eligible for such questions.

What is more interesting in French is that sentences with an in-situ *wh*-phrase in a non-interrogative embedded clause cannot be construed as a matrix question as shown in (64a).

- (64) a. ?*Jean et Pierre croient que Marie a vu qui?
 Jean and Pierre believe that Marie has seen whom
 'Whom do Jean and Pierre believe that Marie saw?'
 b. Qui Jean et Pierre croient-ils que Marie a vu? (Bošković, 2000, p. 64)

This contrasts with English in which a *wh*-question may be formed with a *wh*-phrase in a non-interrogative complement.

- (65) Bill assumes (that) Jill met WHO? (GS, 2000, p. 281)

Furthermore, in contrast to Iraqi Arabic example in (58), in-situ *wh*-phrases are allowed in a non-interrogative embedded clause in French.

- (66) Je sais tres bien qui pense qu'il aime qui.
 'I know very well who thinks that he loves who.' (Kayne, 1984, p. 26)

- (67) Qui croit que Marie a vu qui?
 Who believes that Marie has seen whom
 'Who believes that Marie saw whom?' (Bošković & Lasnik, 1999, p. 694)

Given the examples in (64) and (66-67), we can make a generalization that

in French, an unretrieved parameter (i.e., *wh*-operator) can be inherited into matrix clause only when there is another parameter that is associated with a slashed element. This can be stated as the following constraint:

- (68) (For French verbs with a sentential complement)
 [COMPS < CP[QS{*param*,...}] >] ⇒ [SLASH {[QS{*param*,...}],...}]

The constraint in (68) is weaker than the one in (60) for Iraqi Arabic, in that the stored and inherited parameter doesn't need to be identified with that of the fronted *wh*-phrase in the matrix clause.

So far we have shown that optional *wh*-fronting languages like Iraqi Arabic and French can be analyzed in terms of the same constructional types as in English. Although distribution of in-situ *wh*-phrases are different in all of these three languages, we have proposed that language-specific restrictions can be explained in terms of lexically stated constraints.

4. Comparison with Multiple *Wh*-Fronting Languages

Besides the *wh*-fronting languages that we have discussed so far, an additional type dubbed as multiple *wh*-fronting languages is often discussed. As Rudin (1988) and Comorovski (1996) show, in languages such as Bulgarian and Romanian, all *wh*-phrases in the sentence must be fronted in non-reprise *wh*-questions.¹²⁾ The following Bulgarian examples from Rudin (1988, pp. 82-83) illustrate this:

- (69) a. Koj kogo e vidjal?
 who whom saw-3s
 'Who saw whom?'
 b. *Koj e vidjal kogo?
 who saw-3s whom
 'Who saw whom?'

12) Again we are focused on non-reprise *wh*-questions. Facts on echo questions in these languages are either not solid or complicated. According to Comorovski (1996), in Romanian, even echo questions are formed by obligatory fronting of all *wh*-phrases, except when the echo *wh*-phrase is in an extraction island, or when echo-questions are formed based on the prior *wh*-question. As for Bulgarian, while Rudin (1988) accepts *wh*-in-situ for echo questions, Bošković (2002) assumes that in-situ options are not available in normal echo-questions.

- (70) a. Koj kogo misliš [če e vidjal]?
 who whom think-2s that saw-3s
 'Who do you think saw who?'
 b. *Koj misliš [če e vidjal kogo]?
 who think-2s that saw-3s whom
 'Who do you think saw who?'

The same pattern holds for Romanian, in that all *wh*-phrases are required to be fronted as in (71). *Wh*-phrases that are left in situ or fronted to a non-interrogative clause are not allowed.

- (71) a. Cine_i ce_j [(crezi că) t_i a văzut t_j?]
 who what (think-2s that) has seen
 'Who (do you think) saw what?' (Comorovski, 1996, p. 2)
 b. Cine_i cui_j ce_k zicea_i că t_i i_j -a promis t_k t_j?
 who to-whom what said-2s that to-him has promised
 'Who did you say promised what to whom?' (Comorovski, 1986, p. 171)

In Section 2, the constraint in (25) is posited for English to prohibit multiple *wh*-fronting. Obviously, such a constraint must be absent in multiple *wh*-fronting languages in order to permit multiple occurrences of *wh*-fillers. Meanwhile, for the account of *wh*-retrieval, the same licensing constraints in (21) can be used in these languages as well.

So far nothing guarantees *wh*-fronting of all *wh*-phrases in these languages. We propose that this can be ensured by the constraint in (72).

(72) Obligatory *Wh*-Fronting Constraint

In a *wh-int-cl*, each member in the PARAMS must appear as the WH member of a filler daughter of some projection that has the same SOA value as this clause.

Now examples like (69b) and (70b) cannot be analyzed in terms of *wh*-interrogative clauses, due to the constraint (72). This is because their PARAMS values cannot contain the operators associated with the in-situ *wh*-phrases which do not appear as a filler daughter in the structure.¹³⁾

13) Based on Pesetsky (2000), Bošković (2002) argues that in multiple *wh*-fronting languages,

Although languages like Bulgarian and Romanian require *wh*-fronting of all *wh*-phrases, it is not the case that all multiple *wh*-fronting languages show the same pattern. As discussed in Bošković (2002), in Serbo-Croatian, fronting of more than one *wh*-phrase is optional. McDaniel (1989) shows that Romani also exhibits non-obligatory multiple *wh*-fronting. Romani is a basically multiple *wh*-fronting language as the following examples illustrate:

- (73) a. Ko_i kas_j t_i *dikhla* t_j ?
 Lit. 'Who whom saw?'
 b. Kaj_i kas_j *mislin* [so o Demiri *dikhla* t_j t_i ?]
 Lit. 'Where whom do you think that Demir saw?'
 c. Ko_i kas_j t_i *mislinol* [so o demiri *cuminja* t_j ?]
 Lit. 'Who whom thinks that Demir kissed?' (McDaniel, 1989, p. 590)

However, in contrast to Bulgarian or Romanian, Romani allows *in situ wh*-phrases in multiple questions, as shown in (74).

- (74) a. *Ko dikhla kas?*
 'Who saw whom?'
 b. Kaj_i *mislin* [so o Demiri *dikhla kas t_i*?]
 'Where do you think that Demir saw whom?'
 c. *Ko mislinol* [so o Demiri *cuminja kas*?]
 'Who thinks that Demir kissed whom?' (McDaniel, 1989, p. 589)

We can explain this by assuming that languages such as Romani and Serbo-Croatian posit neither the constraint in (25) nor the one in (72). Since nothing blocks multiple *wh*-fronting or requires fronting of all *wh*-phrases, the optional pattern of multiple *wh*-fronting can be accounted for. Meanwhile, as the constraint (21) is operating in this type of languages as well, fronting of at least one *wh*-phrase is guaranteed in non-reprise *wh*-questions.

D-linked *wh*-phrases behave exceptionally in that they can appear *in-situ* in a context that forces a D-linked interpretation. He alludes that the *in-situ* position of a D-linked *wh*-phrase in these languages may be related to the anti-focus property of a D-linked *wh*-phrase. We are skeptical about the characterization using the notion 'D-linking' due to the unclear distinction it brings up. However, if it turns out to be correct that (anti-)focus is the relevant factor, the constraint in (72) should be relaxed so that the *wh*-operator associated with a [-FOCUS] *wh*-phrase can be also included in the PARAMS of a *wh*-question, regardless of its filler status.

5. Concluding Remarks

In this paper, we have examined various types of syntactic *wh*-fronting languages. First of all, we have shown that for all the languages that we looked at (i.e., English, Iraqi Arabic, French, Bulgarian, Romanian, Romani), the clause type *wh-int-cl* can be posited with the same licensing constraint in (21). More importantly, contrary to the commonly received view that optional *wh*-fronting languages like French are distinct from (single) *wh*-fronting languages like English (Bošković 2000; Johnson & Lappin, 1997; Rizzi, 1991; Yoo, 1997), we have proposed that both types of languages can be treated in terms of the same interrogative clause type hierarchy and type constraints. This view is based on GS's claim that in-situ *wh*-questions, together with ordinary *wh*-fronting questions, should be taken into account in the grammatical analyses of English interrogatives. However, our analysis of in-situ *wh*-interrogatives is different from GS's in that it does not involve an unmotivated unary branching structure. In the account of English in-situ questions, we posit non-reprise in-situ *wh*-questions separately from reprise in-situ questions in the type hierarchy in order to define an *in-situ-wh-int-cl* type that can be adopted for in-situ questions in other languages as well. Thus our analysis has an advantage in providing a basic common structure for in-situ *wh*-questions for *wh*-in-situ languages such as Chinese as well as *wh*-fronting languages such as English and French.

On the other hand, since multiple *wh*-fronting languages require fronting of at least one *wh*-phrase in a non-reprise *wh*-question, it is not necessary to posit the *in-situ-wh-int-cl* type in the clausal hierarchy of these languages. In this respect the proposed view contrasts with Bošković (2002) and Yoo (1997) that argue that multiple *wh*-fronting languages do not necessarily constitute a separate language type in terms of *wh*-question formation.

Furthermore, this paper has provided lexical or constructional constraints for the account of language specific differences in the distribution of *wh*-phrases and restrictions on *wh*-scoping. These constraints are needed to explain language-particular properties that disallow or require multiple *wh*-fronting, and to take into account restrictions on in-situ *wh*-phrases that vary among languages. Such constraints are all supplementary in nature, because the basic type constraints for *wh-int-cl* are assumed to hold across languages.

This paper by no means provides a complete classification of syntactic *wh*-fronting languages or a detailed analysis of each *wh*-fronting language. We have primarily shown that how the *wh*-scoping mechanism and the *wh*-question types in English can be organized and defined in terms of lexical or constructional constraints. Based on this, we have offered ways to extend our analysis to incorporate different *wh*-fronting patterns in some other languages. Although this would be just a beginning of a huge investigation of *wh*-scoping phenomena, we hope that our analysis can serve as grounds for accounting for more diverse patterns of *wh*-interrogatives in many other languages.

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