Wh-in-Situ in Bahasa Indonesia and Choice Function*

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1. Introduction

This paper addresses the question of what is the licensing mechanism of *wh*-in-situ in Bahasa Indonesia/BI. We argue that the relevant mechanism is choice function à la Reinhart (1997, 1998).

2. *Wh*-in-situ in Bahasa Indonesia

BI has three ways of forming *wh*-questions: i) overt syntactic movement to the scopal [Spec, CP], ii) partial syntactic movement to the non-scopal [Spec, CP], and iii) *wh*-in-situ. These three strategies for *wh*-questions are illustrated in (1a-c).

(1) *Wh*-Questions in BI

a. [$_{CP1}$ ***Apa***$_{\mathbf{i}}$ yang kamu pikir [$_{CP2}$ Esti kira [$_{CP3}$ Pak Yanto beli $t_{\mathbf{i}}$ kemarin]]]?
what that you think Esti expect Mr. Yanto buy yesterday?
'What do you think Esti expects Mr. Yanto bought yesterday?'

b. [$_{CP1}$ Kamu pikir [$_{CP2}$ ***apa***$_{\mathbf{i}}$ yang Esti kira [$_{CP3}$ Pak Yanto beli $t_{\mathbf{i}}$ kemarin]]]?
you think what that Esti expect Mr. Yanto buy yesterday
'What do you think Esti expects Mr. Yanto bought yesterday?'

c. [$_{CP1}$ Kamu pikir [$_{CP2}$ Esti kira [$_{CP3}$ Pak Yanto beli ***apa*** kemarin]]]?
you think Esti think Mr. Yanto buy what yesterday
'What do you think Esti expects Mr. Yanto bought yesterday?'

In (1a), the *wh*-phrase *apa* 'what' undergoes overt syntactic movement to the scopal, matrix [Spec, CP]. This option is always available for nominal *wh*-phrases such as *siapa* 'who' and *apa* 'what' but obligatory for non-nominal *wh*-phrases such as *kenapa* 'why' and *bagaimana* 'how'. (1b) illustrates the partial syntactic movement option in BI, where the same *wh*-phrase undergoes movement into the intermediate, non-scopal [Spec, CP] though the example itself has a matrix *wh*-interpretation as in the fully moved example in (1a). This option is available for nominal *wh*-phrases but not for non-nominal *wh*-phrases. Finally, (1c) illustrates the in-situ option. This is possible for nominal *wh*-phrases but impossible for non-nominal *wh*-phrases. This section provides an overview of the structural and interpretive properties of *wh*-in-situ in BI. The discussion in this section draws heavily on the description and analysis of this construction presented by Saddy (1991). Saddy observes that the *wh*-in-situ construction in BI exhibits a spectacular range of syntactic and semantic characteristics that would not be accounted for under standard analyses of the corresponding constructions in other languages such as English, Chinese, and Japanese. We review his main arguments in the rest of this section to show that the two most widely assumed analyses of *wh*-construal, overt/covert syntactic movement and unselective

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binding, are not applicable for *wh*-in-situ in BI. Thus, many of the examples in this section are drawn from his work, unless otherwise indicated. However, we also note that there is a non-trivial divergence between the judgments reported by Saddy (1991) and those reported by the second author of this paper.

2.1. Overt syntactic movement?

The first analysis of *wh*-in-situ in BI that is easily dismissed is the overt null operator/Q-feature movement analysis as proposed by Watanabe (1992) for *wh*-in-situ in Japanese. Overt movement in BI shows island effects, as in (2a-c). This analysis predicts that the in-situ counterparts should be as ungrammatical as (2a-c) but (3a-c) are all fully grammatical.[1]

(2) a.* ***Apa$_i$*** yang kamu katakan [dimana kita beli ***t$_i$***]? (*Wh*-Island)
what that you mention where we buy
'What do you mention where we bought?'

b.* ***Siapa$_i$*** yang kamu sukai [cerita yang mengeritik ***t$_i$*** itu]? (Complex NP Island)
who that you like stories that criticize the
'Who do you like the stories that criticized?'

c.* ***Siapa$_i$*** yang kamu kira [gambar ***t$_i$***] dijual? (Subject Island)
who Foc you think pictures be sold
'Who do you think pictures of were sold? (Saddy 1991: 190, 191)

(3) a. Kamu katakana [kita mem-beli ***apa*** dimana]? (*Wh*-Island)
you mention we TR-buy what where
'What did you mention where we bought?'

b. Kamu sukai [cerita yang mengeritik ***siapa*** itu]? (Complex NP Island)
you like stories that criticize who the
'Who do you like the stories that criticized?'

c. Kamu meng-gira [gambar ***siapa***] dijual? (Subject Island)
you TR-think pictures who be sold
'Who do you think pictures of were sold? (Saddy 1991: 190, 191)

2.2. Covert syntactic movement?

Saddy presents several arguments that the covert movement analysis of *wh*-in-situ as in Huang (1982) is also incorrect for *wh*-in-situ in BI. First, the covert/LF movement in this language obeys island constraints as the overt/syntactic movement. Specifically, *wh*-phrases that remain within syntactic islands in overt syntax still give rise to ungrammaticality, as shown in (4a-c).

(4) a.* Kamu kira (bahwa) [cerita bahwa ***siapa$_i$*** yang ***t$_i$*** memgeritik Jon itu] dijual?
you think that story that who that criticized Jon the be-sold
'Who do you think that the story that *t* criticized Jon was sold?'

b.* Kamu kira (bahwa) [cerita bahwa ***siapa$_i$*** yang Jon megeritik ***t$_i$*** itu] dijual.
you think that story that who that Jon criticized the be-sold
'Who do you think that the story that John criticized *t* was sold?'

[1] (3a) is modified in this paper from Saddy 1991: 190 by changing the verb from *ingat* 'remember' to *katakan* 'mention.'

c.* Kamu men-cemburui Bill [karena [$_{PP}$ dengan ***siapa***]$_i$ yang saya berbicara ***t$_i$***]?
you TR-get jealous of Bill because with who Foc I spoke
'With whom did you get jealous of Bill because I spoke (to) *t*?' (Saddy 1991: 195, 196)

In (4a), the *wh*-phrase *siapa* 'who' undergoes partial *wh*-movement into the intermediate, non-scopal specifier of CP. Since this short extraction does not cross any syntactic island, it cannot be the source of the ungrammaticality. The ungrammaticality follows if we assume that the LF/covert movement of the partially moved *wh*-phrase into the matrix specifier of CP obeys island constraints in BI. According to this analysis, the *wh*-phrase *siapa* 'who' undergoes covert movement into the scopal specifier of CP for the purposes of scope taking. This movement thus renders (4a) ungrammatical due to its crossing the syntactic island. The same story holds for (4b) and (4c). Thus, (4a-c) show that covert movement obeys island constraints in BI. Now, if the covert movement analysis of *wh*-in-situ in languages like Chinese, Japanese, and English (under multiple interrogative questions) is correct for BI, the in-situ counterparts of (4a-c) should be ungrammatical because the LF representation of the in-situ variants would be identical to that of (4a-c). This prediction is falsified by (5a-c).

(5) a. Kamu kira (bahwa) [cerita bahwa ***siapa*** mengeritik Jon itu] dijual?
you think that story that who criticized Jon the be-sold
'Who do you think that the story that *t* criticized Jon was sold?'
b. Kamu kira (bahwa) [cerita bahwa Jon mengeritik ***siapa*** itu] dijual?
you think that story that Jon criticized who the be-sold
'Who do you think that the story that John criticized *t* was sold?'
c. Kamu men-cemburui Bill [karena saya berbicara dengan ***siapa***]?
you TR-get jealous of Bill because I spoke with who
'Who did you get jealous of Bill because I spoke with *t*?' (Saddy 1991: 195, 196)

The second argument against the LF movement approach to *wh*-in-situ in BI is based on the fact that this language does not allow complements that contain a *wh*-in-situ for verbs such as *ingin tahu* 'want to know, wonder' that are obligatorily subcategorized for the [+WH] complement, as in English. This is illustrated by the contrast between (6a) and (6b).

(6) a.* Saya ingin tahu Jon men-cintai ***siapa.*** 'I want to know who Jon loves.'
I want know Jon TR-love who
b. Saya ingin tahu ***siapa*** yang Jon Ø-cintai. 'I want to know who Jon loves.'
I want know who Foc Jon love (Saddy 1991: 207)

If the [+WH] subcategorization of the verb *ingin tahu* 'wonder' [+WH] must be satisfied by the [+WH] feature within its complement CP, then the fact that in-situ *wh*-elements do not satisfy the [+WH] requirement of this verb as in (6a) suggests that it does not substitute into the specifier of CP, in contrast to overtly moved *wh*-phrases, as in (6b). This contrast would remain mysterious under the LF covert movement analysis because the interrogative CP requirement would be satisfied by the covert movement of the in-situ phrase *siapa* 'who' into the specifier of the embedded CP. By contrast, the difference in grammaticality here naturally falls out if the in-situ *wh*-phrase in (6a) literally remains in situ.

Third, Saddy observes that *wh*-in-situ in BI does not show crossover effects, as shown in (7a, b).[2]

[2] We have added the star * in parenthesis for the examples in (7a, b). See discussion below in the text for why.

(7) a. (*) Dia$_i$ meng-harap Jon men-cintai ***siapa***$_i$? '*Who$_i$ does he$_i$ expect Jon to love?'
he TR-expect Jon TR-love who
b. (*) Prof dia$_i$ meng-ira saya men-cintai ***siapa***$_i$? '*Who$_i$ does his$_i$ professor thinks I love?'
Prof his TR-think I TR-love who (Saddy 1991: 207, 208)

The standard assumption on the crossover effect is that it arises when a pronoun fails to be c-commanded both by a binder and by its variable at the surface/derived structure to be construed as a variable. Under the movement analysis, this effect can be formalized as the filter of the form * [*wh*$_i$ …. pronoun$_i$… t_i]. The strong and weak crossover effects arise in examples as in (8a) and (8b), respectively, because the pronoun coindexed with the binder is not c-commanded by the variable, namely, *t*. The unacceptability of examples as in (8a, b) show that the relevant effect is also caused by quantifier raising (May 1985), a case of LF movement.

(8) a. * Who$_i$ does he$_i$ love t_i?
b.*? Who$_i$ does his$_i$ mother love t_i ?

(9) a.* He$_i$ loves everyone$_i$.
b.* His$_i$ mother loves everyone$_i$.

Under this assumption, the alleged lack of the weak/strong crossover effect in (7a, b) can be construed as evidence that the *wh*-phrase *siapa* 'who' remains in its thematic position both in overt syntax and at LF. If the overt movement occurred into the specifier of CP that c-commands the pronoun coindexed with the *wh*-operator, then the resulting configuration would cause the strong/weak crossover effect in (7a, b), contrary to facts. If the covert movement were correct, then the LF movement would cause the same violation as quantifier raising would as in (9a, b). Thus, the absence of the crossover effects in examples as in (7a, b) cast doubts on the validity of the syntactic movement as the mechanism of in-situ *wh*-construal in BI. This result, however, is naturally expected if we assume again that the *in*-situ phrase really remains in situ. This argument crucially depends on the grammaticality of the examples in (7a, b) as reported by Saddy. It is debatable, however, whether this observation holds for BI. Cole and Hermon (1998) provide data as in (10) to show that the crossover effect *is* observed in *wh*-in-situ in the dialect of Malay they document, contrary to what Saddy reports for BI.

(10) * Prof dia$_i$ fikir saya meny-intai ***siapa***$_i$? 'Who$_i$ does his professor think I love t_i?'
Prof his think I TR-love who (Cole and Hermon 1998: 234)

The second author of this paper also concurs with Cole and Hermon, reporting that (7a, b) are unacceptable when the pronominal *dia* is construed as a variable whose value co-varies with that of the *wh*-operator. It is not clear at this moment what causes this variation in the acceptability of the examples in (7a, b) but if the judgment cited by Saddy represents the minority one in the literature in BI, then (7a, b) are deemed ungrammatical. We maintain here, following Cole and Hermon (1998: 234), that the presence of the weak crossover effect does not mean that the in-situ *wh*-phrase in (7a, b) undergoes syntactic movement because the crossover effect can be formulated in non-movement terms as a constraint on the representation. Specifically, Cole and Hermon (1998) argue that the crossover effect can be analyzed as the byproduct of the Bijection Principle of Koopman and Sportiche (1983) that prohibits a single operator from binding more than one variable. This principle allows us to correctly block (7a, b) without also assuming the syntactic movement because the base-generated *wh*-operator in [Spec, CP] binds both the pronoun and the variable. For this reason, we conclude, contrary to Saddy, that the presence of the crossover effect itself does not show that *wh*-in-situ undergoes syntactic or LF movement.

The last argument made by Saddy against the LF movement analysis of *wh*-in-situ in BI is based on his observation that this construction does not support a pair-list reading. Consider (11).

(11) Siapa mem-beli ***apa***? 'Who bought what?'
Who TR-bought what (Saddy 1991: 208)

Saddy reports that this multiple *wh*-question can only be interpreted as a request for a single pair as in *John bought a book*; thus, the answer as in *John bought a book, Mary bought a magazine, Bob bought a shirt* is not a possible reply to this question. Since Higginbotham and May (1981) on English multiple interrogatives, the availability of the pair-list reading for English sentences like *who bought what* has been taken to be driven by the association of the two *wh*-phrases in the same Comp at LF (or the multiple specifiers of the same C in the more modern terminology) known as *absorption*. To the extent that this analysis is correct, the lack of the pair-list reading in (11) shows that *apa* 'what' does not undergo any movement either in overt syntax or LF. Accordingly, this example provides evidence against the movement approach to the *wh*-construal in BI. Again, however, the second author has reported that the pair-list reading is available in sentences like (11) above. This is also the judgment elicited from speakers of Malay by Cole and Hermon (1998: 225), who report that their Malay informants had no problem with a list interpretation for sentences as in (12).

(12) Siapa kamu fakir beli apa? 'Who did you think bought what?'
who you think buy what (Cole and Hermon 1998: 225)

This judgment, therefore, indicates that the argument against the LF movement based on the pair-list reading is not strong as Saddy wanted it to be. We come back to this point in section 4.

To sum up this section, we have reviewed a total of four arguments presented in Saddy that the covert movement analysis is not an adequate mechanism of licensing *wh*-in-situ in BI. Though the two arguments based on the crossover effect and the unavailability of the pair-list reading in multiple questions do not necessarily argue for or against the LF movement analysis, the other two other arguments from the lack of island effects and the [+WH] subcategorization requirements provide relatively clear evidence that this analysis is not applicable to BI *wh*-in-situ.

2.3. Unselective binding?

The third potential analysis of *wh*-in-situ, which is perhaps the most widely held analysis for *wh*-in-situ in languages such as Japanese and Chinese, is that of unselective binding (Pesetsky 1987); we defer the variant of this approach presented recently by Cole and Hermon (1998, 2000) until section 4.4). Pesetsky (1987) proposes that *wh*-interpretation is achieved not only by syntactic movement but also a non-movement mechanism called *unselective binding*. Pesetsky claims that the choice between these two options is determined by the notion of *D(iscourse)-Linking*, which roughly corresponds to the morphological distinction of English *wh*-words between "*which*-X" (*which man, which book,* etc) and everything else (*who, what,* etc). As Pesetsky (1987: 107, 108) remarks, *which*-phrases are *discoursed-linked* (*D-linked*), because "when a speaker asks a question like *which book did you read?*, the range of felicitous answers is limited by a set of books both speaker and hearer have in mind" whereas "no such requirement is imposed on *wh*-phrases like *who, what,* or *how many books.*" Based on this discourse-related observation, Pesetsky argues that if a *wh*-phrase is D-linked, it

contains a variable that is unselectively bound by a Q-morpheme located in the scopal C head position and thereby is licensed without syntactic movement. On the other hand, if a *wh*-phrase is not D-linked, it must undergo syntactic movement, be it overt or covert, to be properly licensed by the scopal C. Pesetsky draws various types of evidence concerning the presence/absence of superiority effects in English questions as well as the behavior of what he calls aggressively non-D-linked *wh*-phrases such as *what the hell* in English and its equivalent in Japanese to support this hybrid approach to *wh*-construal.

Saddy, however, point outs a couple of potential problems with Pesetsky's version of unselective binding analysis when applied to *wh*-in-situ in BI. The first problem concerns the morphological composition of *wh*-phrases in BI. As we have seen above, Pesetsky's analysis rests upon the correlation between the morphological composition of a *wh*-phrase and its interpretive mechanism. This correlation, however, does not hold in BI because *wh*-phrases in this language all have "D-linked" expressions corresponding to English "*which*-X" form. For example, *orang siapa* 'which person", which would be analyzed as a D-linked phrase in Pesetsky's terms, is used interchangeably with the non-D-linked form *siapa* 'who' but this difference in morphological composition does not change the interpretive and structural constraints observed so far in this section. Though this observation may not be a problem for Pesetsky's theory directly, it indicates that Pesetsky-style D-linking is not directly applicable to BI *wh*-questions. The second potential problem with the extension of Pesetsky's analysis to BI is based on the quantificational uninformativeness of *wh*-in-situ in BI as reported by Saddy. Pesetsky (1987) employs D-linking to account for the triplet interpretation available for examples as in (13) below so that the D-linked phrase *which prize* may get matrix scope without movement by being bound by the matrix Q, as shown in (14).

(13) *Who* did every athlete expect to win *which prize*?
triplet answer: Gretsky expected Milli Vanilli to win an Oscar, Gefrion expected George Burns to win Grammy, etc. (Saddy 1991: 204)

(14) $[_{S'}\,[_{Comp}\,Q_{i,j}\,\textit{who}_i\,[_S\,e_i\,\textit{every athlete}$ expect…. win $\textit{which prize}_j]]$

Importantly, this analysis crucially assumes that D-linked in-situ phrases such as *which prize* must be able to interact in scope with other scope-bearing elements such as *every athlete*; for, the triplet interpretation otherwise would be unavailable in examples like (13). As Saddy (1991: 205) puts it, "it is a necessary property of Pesetsky's Q-bound D-linked WH expressions that they interact quantificationally with other elements in the matrix clause." When applied to BI *wh*-in-situ constructions akin to (13), Pesetsky's analysis predicts that this type of construction also should allow the triplet interpretation. Saddy observes that this prediction is false because, according to his informant work, this reading is precisely the kind of interpretation that BI *wh*-in-situ resists, as shown in examples like (15a).

(15) a. Setiap orang men-cintai ***siapa***? 'Who did every person love?'
every person TR-love who (who>every, *every>who)
b. Siapa$_i$ yang setiap orang Ø-cintai ***t***$_i$? 'Who did every person love?'
who Foc every person love (who>every, every>who) (Saddy 1991: 199)

The example in (15a) with the *wh*-phrase in situ only allows the wide scope reading of the in-situ phrase with respect to the universal quantifier *setipa orang* 'every person' in subject position; the

reading where the value of the person loved co-varies with that of the lover is impossible. This latter reading becomes available only when the *wh*-phrase must undergo overt syntactic movement, as shown in (15b). Saddy notes that the same contrast holds in the triplet of examples as in (16a-c).

(16) a. Setiap orang tahu Tom mem-beli ***apa***? 'What does every person know Tom bought?'
every person know Tom TR-buy what (what>every, *every>what)
b. Setiap orang tahu ***apa*** yang Tom beli t_i? 'What does every person know Tom bought?'
every person know what Foc Tom buy (what>every, every>what)
c. ***Apa*** yang setiap orang tahu Tom beli t_i? 'What does every person know Tom bought?'
what Foc every person know Tom buy (what>every, every>what)
(Saddy 1991: 200)

According to Saddy, the in-situ *wh*-phrase *apa* 'what' necessarily takes wide scope over the universal quantifier *setiap orang* 'every person' in (16a), even though the relative structural height of the latter with respect to the former leads us to expect the opposite reading. Again, the wide scope reading of the universal quantifier over the *wh*-phrase is only possible when the latter undergoes movement, either partially, as in (16b), or fully, as in (16c). Saddy takes the interpretive outcomes seen in these examples as evidence that *wh*-in-situ in BI is quantificationally uninformative with respect to other scope-bearing expressions, unlike moved *wh*-phrases. This result would remain mysterious under Pesetsky's Q-binding analysis of triplet questions. Saddy thus concludes that Pesetsky's analysis is inadequate for BI.

We would like to add, however, is that we could not reproduce the same judgments as elicited by Saddy from his BI consultants. According to the second author, both (15a) and (16a) allow the narrow scope reading of the in-situ *wh*-phrase with respect to the universal quantifier, the reading where the value of the thing bought and the person loved can vary with the value of the universal quantifier. This result, therefore, shows that the *wh*-in-situ in BI is scopally *informative*, contrary to what Saddy reports. At this moment, we have no idea how scope judgments can diverse in such a clear manner, as we do not know the linguistic backgrounds of Saddy's language consultants; it may be a reflex of the ongoing change that BI experiences through its interaction with languages like Dutch, English, and many other local languages spoken in BI. For the purposes of this paper, we assume that the second author reflects the majority judgment, keeping in mind, though, that Saddy's elicited judgments might also hold for certain dialects of BI. We come back to this in section 4.2. If so, we have lost one major argument against Pesetsky's version of the unselective binding approach to *wh*-in-situ in BI. However, in section 4.1, we review Reinhart's (1997, 1998) evidence that casts doubts on the general applicability of unselective binding as a possible in-situ strategy based on the scope behavior of *wh*-in-situ in multiple questions in English and BI, by extension. Anticipating this discussion, we conclude here that Pesetsky's analysis is not suitable for *wh*-in-situ in BI.

3. *Wh*-in-Situ in Bahasa Indonesia is not an interrogative definite description

Saddy (1991) proposes that *wh*-in-situ in BI behave as an interrogative definite description, drawing on an impressive range of syntactic and semantic parallelisms that hold between this class of expressions and words of the form "this-X/these-Xs" in game show questions in English. An example of English game show quizzes is given in (17).

(17) Question: For $100, every armchair general watched this television station.
Answer: What is NBC? (slightly modified from Saddy 1991: 208)

The question in (17) does not have interrogative force in the standard sense as a *wh*-question because it is syntactically a declarative statement; rather, it gains such force from the very context that this sentence is uttered in a game show question; a host utters this sentence to challengers, expecting them to make a question such that it is an appropriate answer to the definite NP *this television station*. In other words, the interrogative requirement here is that challengers identify the member (s) of the definite description of the form 'this-X/these-Xs.'

As mentioned above, the reason Saddy brought up this type of game show in his work is because of his observation that statements as in (17) in the game show context exhibit exactly the same range of structural and interpretive properties that we have seen to characterize *wh*-in-situ in BI. Space limitations prevent us from reproducing all the relevant examples from Saddy (1991: 210-212). Saddy argues that the definite description analysis of *wh*-in-situ in BI provides a unified account of all the properties we have seen to hold for this class of *wh*-questions. The scopally uninteractive behavior of in-situ *wh*-phrases is a natural consequence of the fact that it is a definite description, namely, that they "pick out a specific individual or a set of individuals." (p. 212). *Wh*-in-situ does not satisfy the WH-complement requirement of verbs like *ingin tahu* 'wonder' because it does not move at all into the specifier of the complement CP but instead is licensed in situ by a non-quantificational mechanism by virtue of its definite nature. Similarly, the lack of pair-list reading and weak/strong crossover effects and the insensitivity to syntactic islands for the purposes of scope taking are all derived because *wh*-in-situ in BI is interpreted in situ. Saddy's analysis is extremely ingenious in a number of important ways. For example, it provides a unified, non-stipulatory account of all the otherwise mysterious syntactic and semantic characteristics associated with *wh*-in-situ in BI from the single fact that this class of *wh*-words is an interrogative definite description. More importantly for the purpose of this paper, his analysis suggests that natural languages may well develop a non-syntactic mechanism of licensing *wh*-in-situ in its base position without relying on syntactic movement. However, there are problems that cast doubts on Saddy's treatment of *wh*-in-situ in BI. The first argument is that there is evidence internal to BI that *wh*-in-situ in this language contains a variable. Cole and Hermon (1998) observe that nominal *wh*-words in Malay can be used as a variable bound by non-*wh*-operators, as shown in (18a, b) and (19a, b). This observation also holds for BI.

(18) a. Dia tidak mem-beli ***apa-apa*** untuk saya. 'He did not buy anything for me.'
he not TR-buy what-what for me
b. Dia tidak mem-beli ***apa-pun*** untuk saya. 'He did not buy anything for me.'
he not TR-buy what-also for me (Cole and Hermon 1998: 239)

(19) a. Saya tidak kenal ***siapa-siapa*** di universiti itu.
I not recognize who-who at university that
'I didn't recognize anyone at that university.'
b. Saya tidak kenal ***siapa-pun*** di universiti itu.
I not recognize who-who at university that
'I didn't recognize anyone at that university.' (Cole and Hermon 1998: 239)

In (18a) and (19a), the *wh*-word is bound by the existential quantifier that is overly represented by the reduplication of the question word itself. Similarly, in (18b) and (19b), the *wh*-word is bound by the existential quantifier realized in the form of *-pun* 'also'. This use of the in-situ *wh*-words, therefore, shows that this class of words contain a variable. This result is problematic for Saddy's analysis because definite descriptions as a rigid designator do not contain a variable under the most

commonly held assumption. The second argument against Saddy's analysis is that it misses the important generalization that *wh*-in-situ in BI behaves more like existential indefinites rather than definite descriptions. It is widely acknowledged that certain weak/existential indefinites such as singular NPs (e.g., *someone*, *something*) and cardinal plurals (e.g., *two men*, *many women*) are insensitive to syntactic island for scope-taking, as the contrast between (20a-c) and (21a-c) shows.

(20) a. Someone reported that Max and *all the ladies* disappeared. ⇨ some>all, * all>some
b. Someone will be offended if we don't invite *most philosophers*. ⇨ some>most, *most>all
c. Many students believe anything that *every teacher* says. ⇨ many>every,* every>many
(Reinhart 1997: 338)

(21) a. Everyone reported that Max and *some lady* disappeared. ⇨ every>some, some>every
b. Most guests will be offended if we don't invite *some philosopher*. ⇨ most>some, some>most
c. All students believe anything that *many teachers* says. ⇨ all>many, many>all
(Reinhart 1997: 339)

(20a-c) show that strong quantifiers such as *all*, *most*, and *every* cannot violate one or the other island constraints to take wide scope over another scope-bearing element in the matrix clause. This is not surprising if we assume that Quantifier Raising, an instance of LF movement, is constrained by the island constraints, as is overt syntactic movement. What is surprising, then, is the fact, illustrated in (21a-c), that weak existential indefinites such as *some* and *many* take wide scope over the quantifier in the matrix subject position in apparent violation of the island constraints that we have just seen to constraint the Quantifier Raising operation. This wide scope reading of certain existential indefinites has been a source of endless controversies in formal semantics (see Kratzer 1998, Reinhart 1998 and references cited therein). Whatever the ultimate analysis might turn out to be, this island-insensitive behavior is similar to that of *wh*-in-situ in BI. We have seen in section 2 that this class of phrases can freely take widest scope in a massive violation of the standard set of island constraints on movement. Given this parallelism, the null hypothesis is that *wh*-in-situ in BI should be treated also as existential indefinites. This indeed has been a standard assumption on *wh*-phrases in the literature (Karttunen 1977). Based on the above considerations, we reject Saddy's approach to *wh*-in-situ in BI and seek an alternative account that captures the insight behind his work that *wh*-in-situ in BI is interpreted in situ. [3]

4. The choice function analysis of *wh*-in-situ in BI

Reinhart (1997, 1998) claims that there is an interpretive mechanism available for indefinite expressions including *wh*-phrases that allows existential quantification over choice functions. Reinhart argues that introducing this way of licensing allows for a unified explanation for the set of problems with traditional analyses in terms of LF movement and unselective binding/absorption.

[3] Of course, what is the proper analysis of the game show question with the properties as observed by Saddy is a separate question that we leave aside in this chapter. We note here, however, that the choice function analysis of the kind developed by Kratzer (1998) and Matthewson (1999) has suitable theoretical properties to accommodate this type of question. Kratzer argues that indefinites in English are divided into specific and quantificational and that they must take widest scope when interpreted as specific in the form of choice function. Matthew provides evidence for Kratzer's analysis from evidence in St'át'imcets. Since Saddy's core claim is that all the peculiar properties of the "this-X/these-Xs' in the game show question are derivable from their denotation as a definite description, it is likely that Kratzer/Matthewson-style analysis provides a unified account of the observed properties. See Sato (in preparation) for such an analysis.

4.1. Choice function

Reinhart (1997, 1998) starts by showing that neither the LF movement (Huang 1982) and unselective binding (Pesetsky 1987) /absorption (Higginbotham and May 1981) analyses of *wh*-in-situ in multiple questions in English are tenable on the ground that they cannot derive several properties associated with this type of expressions. Consider like (22a-d).

(22) a. Who fainted when you attacked whom?
b. * Who fainted when you behaved how?
c. * How did Max faint when you behaved?
d. Who fainted when you behaved what way? (Reinhart 1998: 31, 44)

It has been standardly assumed since the seminal work by Huang (1982) that overt syntactic movement obeys both subjacency and the ECP whereas covert LF movement is only constrained by the ECP. Reinhart notes, however, that this line of analysis cannot account for the contrast between (22b) and (22d); it would incorrectly predict the latter to be ungrammatical because *what way* is an adjunct just as *how*. Another problem with this analysis is that this way of assigning matrix scope is untenable in the first place within the Minimalist Program (Chomsky 1995), under which movement is subject to the "shortest steps" requirement. Consider (23a), which is assigned the LF representation in (23b) under the matrix scope reading of the in-situ *wh*-phrase.

(23) a. Who knows where to find what.
b. for which <x, y>, x knows where to find y (Reinhart 1998: 33)

Reinhart notes that the very movement here is impossible within the minimalist framework because it is less economical in terms of the shortest movement requirement than its potential movement into the specifier of the embedded CP. Thus, this example shows that the scope assignment of *wh*-in-situ via LF movement is untenable and that a non-movement licensing is in need.

Reinhart further shows that the non-movement approach to *wh*-in-situ in terms of unselective binding/absorption also fails in light of the interpretation of examples as in (24).

(24) Who will be offended if we invite which philosopher? (Reinhart 1998: 36)

Reinhart assumes the semantics of questions proposed by Karttunen (1977): the denotation of a question is the set of propositions which constitute true answers to it. The unselective binding/absoportion mechanism would assign the interpretation shown in (25a), which is formally represented as in (25b) under Karttunen's model, for the example in (24).

(25) a. for which <x, y>, if we invite y and y is a philosopher, then x will be offended.
b. {P|(∃〈x, y〉)} & P =^ ((we invite y and y is a philosopher) → (x will be offended) & true (P))
c. Lucie will be offended if we invite Donald Duck. (Reinhart 1998: 36)

In (25a), the restriction is contained in the implication of an *if*-clause. Given the truth-theoretic conditions on such a clause, (24) would come out true in cases where the value of y is a member of the non-philosopher set; for example, the sentence would be true if Donald Duck is inserted as in

(25c), since he is not a philosopher. This is, however, what (24) does not mean. What we need, thus, is to pull out the restriction from the implication as in (26a) or its Karttunen-style equivalent in (26b).

(26) a. for which <x, y>, y is a philosopher, and if we invite y, x will be offended.
b. {P|(∃〈x, y〉)(y is a philosopher) & P =^ ((we write y) → (x will be offended)) & true (P))}
(Reinhart 1998: 36)

Thus, examples as in (24) above show that the absorption/unselective binding is not adequate for assigning scope for *wh*-in-situ phrases. At the same time, they indicate that the ultimate mechanism for this purpose is such that it allows us to ensure that the value of the *wh*-in-situ will be necessarily chosen from the set of members that satisfy its accompanying restriction.

Reinhart argues that the problems with LF movement or unselective binding/absorption noted above are naturally solved once we allow existential quantification over choice function in the form of existential closure. Choice function is defined as in (27).

(27) A function *f* is a choice function (CH (*f*)) if it applies to any non-empty set and yields a member of that set. (Reinhart 1997: 372)

For example, the LF representation of (28a) under the wide scope reading of the indefinite is shown in (28b) under the choice function approach.

(28) a. Every lady read some book. b. ∃ f (CH(f) & (∀ z) (lady (z) → z read f (book))

In the LF representation, the indefinite *book* is replaced by a function variable to be bound by an existential operator that is base-generated in the highest level. The choice function here thus applies to the non-empty set of books and picks up one member out of this set. This representation says that there is a function f such that for every z, if z is a lady, z reads the book selected by this function. More informally, this representation means that there is a book that is read by every lady.

The choice function analysis provides a straightforward solution to the problems noted above with LF movement or unselective binding/absorption approaches. First, the contrast between (22a, d) and (22b) follows under the standard assumption from Szabolcsi and Zwarts (1993) that adverbial *wh*-phrases do not have an N-set and that they denote functions ranging over higher-order entities. (22a, d) are grammatical because *whom* and *what way* contain an N-set, a necessary condition for the choice function to work. On the other hand, (22b) is ungrammatical because *how* cannot be evaluated by choice function due to its lack of N-set; the required LF movement would be blocked by the shortest movement requirement. The "Donald Duck" problem, which we have seen to arise with unselective binding/absorption above, is also solved as the direct consequence of the choice function because, as defined in (27), a choice function applies to a non-empty set of individuals and yields a member *out of this set*. The value for *y* is, then, correctly ensured to be selected from the set of philosophers.

4.2. Deriving the properties of *wh*-in-situ in BI

Let us now see whether all the syntactic and semantic properties discovered by Saddy (1991) with respect to *wh*-in-situ in BI follow under the choice function approach. The relevant properties are summarized in (29a-e).

(29) Syntactic and Semantic Properties of *Wh*-in-Situ in BI
- a. *Wh*-in-situ is insensitive to syntactic island/ECP effects.
- b. *Wh*-in-situ is not able to satisfy verbs' *+wh* subcategorization requirement.
- c. *Wh*-in-situ is immune to weak/strong crossover effects.
- d. *Wh*-in-situ is scopally uninteractive, always taking non-overt wide scope.
- e. *Wh*-in-situ is not able to support a pair-list reading for multiple *wh*-questions.

(29a) is directly derived from the simple fact that *wh*-in-situ remains in situ throughout the syntactic derivation (including on the mapping to LF). (29b) is derived for the same reason; this class of expression cannot satisfy the [+WH] subcategorization requirement of verbs such as *ingin tahu* 'wonder' because it does not move under the assumption that this requirement can only be satisfied by syntactic movement of the *wh*-phrase into the specifier of the CP selected by such verbs. Similarly, to the extent that (29c) holds (recall our earlier conclusion that this property itself is silent about whether the movement has occurred or not), the lack of crossover effects is a natural consequence of the fact that *wh*-in-situ does not undergo movement. The properties in (29d, e) need more elaborate discussion. As we have seen in section 2.3, Saddy observes that in-situ *wh*-phrases do not show scope interaction with quantifiers that c-command them but instead take only widest scope. To the extent that this judgment is real, his observation naturally follows from Reinhart's (1997, 1998) assumption that existential closure of a function variable introduced by an NP can be inserted in the highest possible position. Thus, sentences like (15a), repeated as (30a), would receive the LF representation in (30b).

(30) a. Setiap orang men-cintai siapa? 'Who did every person love?'
every person TR-love who (who>every, *every>who)

b. {P| $\exists$ <f> (CH(f)) & ($\forall$ x) & P =ˆ (person (x) $\rightarrow$ x loves f (person)) & true (P))}

In (30b), choice function applies to a set of persons in a given world and picks out one member from this set. This representation corresponds to the wide scope reading of the in-situ *wh*-phrase over the universal quantifier in subject position. We have seen in section 3, however, that Saddy's characterization of the scope of *wh*-in-situ cannot be reproduced in our grammatical judgment task. This raises the question of whether the existential operator that binds the function variable does not always have to be introduced at the highest possible scopal position but instead can be introduced in the scope of another quantifier. If the answer is yes, the scope interaction between *wh*-in-situ and c-commanding universal quantifiers, as reported by the second author, is predictable. Indeed, Reinhart (1998) shows, based on (31a), that the operator can be inserted within the scope of another operator, as in (31b).

(31) a. Most linguists have looked at every analysis that solves some problem.

b. For most linguists x, ($\exists$ (f)) (CH (f) & ($\forall$ y) (analysis (y) and y solves f(problem)) $\rightarrow$ (x looked at y)).
(Reinhart 1998: 40)

According to Reinhart (1997: 40), "the choice of a problem may vary with the choice of a linguist, in which case some problem is not "specific." Nevertheless it can take scope over every analysis." Thus, this intermediate reading of the indefinite *some problem* is naturally accounted for if we assume that the existential operator is below another quantifier *most*, as shown in (31b). This analysis predicts that the corresponding *wh*-in-situ in BI should also be able to take this intermediate scope in sentences like (32a). This prediction is indeed confirmed. The LF representation for (32a) then looks like (32b).

(32) a. Tiga siswa mempertimbangkan setiap analisis yang memecahkan masalah yang mana.
three student consider every analysis that solve problem that which
'Three students considered every analysis that solved which problem?'
⇨ intermediate scope reading: three> which>every
b. For three students x, (∃ (f)) (CH (f) & (∀ y) (analysis (y) and y solves f(problem)) → (x consider y)).

This observation, on the other hand, would remain mysterious under Saddy's account because it crucially depends on his observation that *wh*-in-situ in BI always takes widest possible scope.

4.3. New predictions: The NP vs. non-NP Asymmetry

We have introduced Reinhart's approach to *wh*-in-situ and shown that all the properties associated with BI *wh*-in-situ can be straightforwardly derived from the notion of choice function. It is important that, given the definition of choice function in (27), we can make the prediction that the availability of choice function crucially depends on whether a given in-situ *wh*-phrase can denote an N-set. In other words, we predict that the NP vs. non-NP asymmetry should be observed essentially in the same way as in (22a, b, d). Cole and Hermon (1998) show that this prediction is indeed borne out in Malay. Examples in (33a-g) are constructed in BI based on the related but partial paradigm from Malay reported in Cole and Hermon (1998: 226).

(33) a. ***Siapa*** mem-beli buku?
who TR-buy book
'Who bought a book?'
b. Esti mem-beli ***apa***?
Esti TR-buy what
'What did Esti buy?'
c. Esti mem-beli buku ***dimana***?
Esti TR-buy book where
'Where did Esti buy a book?'
d.* Esti mem-beli buku ***bagaimana***?
Esti TR-buy book how
'How did Esti buy a book?'
e. Esti mem-beli buku dengan ***cara apa***?
Esti TR-buy book with way what
'In what way did Esti buy a book?'
f.* Esti mem-beli buku ***mengapa***?
Esti TR-buy book why
'Why did Esti buy?'
g. Esti mem-beli buku ***untuk apa***?
Esti TR-buy book for what
'For what did Esti buy a book?'

4.4. The showdown: Cole and Hermon's (1998, 2000) unselective binding vs. choice function

A slightly different implementation of the non-syntactic, in-situ approach to *wh*-in-situ has been independently proposed by Cole and Hermon (1998, 2000) based on the data from Malay. Cole and Hermon (1998: 240) propose that "in *wh*-in-situ in Malay the (*wh*-OP) question operator is merged at the root Spec CP, and, therefore, unselectively binds a *wh*-variable in its scope." This analysis derives essentially the same set of facts concerning BI *wh*-in-situ as the choice function analysis. Then, their analysis might amount to the same thing as choice function. Indeed, they note (p. 240), for example, that "since it does not affect the issues under consideration in this paper, we will maintain the pretense that the question operator binds the *wh*-variable directly rather than through the mediation of a choice function, and shall continue to employ the term 'unselective binding'." The same position is maintained in Cole and Hermon (2000: 106), who remark that "Reinhart 1995 argues that the correct mechanism for in situ interpretations of *wh* is a choice function rather than

unselective binding. We leave this issue open since the precise mechanism for in situ interpretation is irrelevant for our analysis." Cole and Hermon (2000), however, is more explicit in their analysis of *wh*-in-situ, as shown in their proposed schematic representation given below.

(34) Unselective Binding of *Wh*-in situ:
[$_{CP}$ OP$_i$ [... [$_{CP}$ ...*wh*$_i$]]]
where wh is a variable in a base-generated position and OP is base-generated in scopal position and binds *wh*. (Cole and Hermon 2000: 109, their (17))

The explication of Cole and Hermon's analysis above might give us the impression that the choice function approach is a notational variant of their proposed version of unselective binding. However, we show below that the predictions do diverge with respect to the "Donald Duck" Problem and the intermediate scope reading noted by Reinhart and that the choice function analysis is superior to Cole and Hermon's analysis. The first divergence between the choice function approach and Cole and Hermon's version of the unselective binding concerns the interpretation of in-situ *wh*-phrases in BI contained within an *if*-clause. Recall that the LF representation of (25a), which would be derived under selective binding, fails to express the fact that the value of the denotation of the in-situ *wh*-phrase must be selected from the set of philosophers because this approach would leave the restriction (philosopher) in the implicational clause at LF, as shown in (25b), and render (25a) true even though the value of *y* is Donald Duck, as shown in (25c). This "Donald Duck" problem won't arise under the choice function approach because the value of y must be selected from the non-empty set of philosophers in a given model/world. Therefore, Cole and Hermon's analysis cannot capture the correct interpretation unless it is accompanied with special mechanisms of pulling out the restriction out of the antecedent of an implicational clause. Several technical additions would not be inconceivable to avoid this problem. The point here, however, is that none of such special additions is required under the proposed approach. The second domain in which the predictions of the two competing approaches would diverge concerns the intermediate scope reading illustrated by (32a). The LF representation in (32b) is derived under the choice function, which correctly captures the intermediate reading. It is not clear whether this intermediate scope reading would be derived under Cole and Hermon's version of the unselective binding approach. In their 1998 paper, they assume that the *wh*-in-situ in Malay is bound unselectively by the operator base-generated in the root [Spec, CP]. Accordingly, it would falsely predict that the intermediate scope reading would be impossible. The same problem remains with their analysis updated in their 2000 paper because it base-generates the operator in the scopal [Spec, CP]. Crucially, however, the intermediate reading in (32a) requires that the operator must be base-generated in a position in the matrix clause that is lower than the specifier of the matrix TP but higher than the complement of the matrix VP. The relevant reading would be impossible, contrary to facts. Based on these two divergences between Cole and Hermon's analysis and the choice function analysis, we conclude that the two analyses are not entirely the same. The latter analysis makes better predictions concerning the "Donald Duck" Problem and the intermediate scope reading. The two problems could be technically solvable by several special amendments on the mapping from syntax to LF under Cole and Hermon's analysis but the fact that these amendments are not necessary but instead derived from the way choice function independently works provide strong support in favor of the choice function analysis over the unselective binding analysis.

5. Conclusions

The correct licensing mechanism for *wh*-in-situ in BI is choice function à la Reinhart (1997, 1998).

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