Cyclicity and the Scope of Wh-Phrases

by

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Submitted to the Department of Linguistics and Philosophy
in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

at the

Massachusetts Institute of Technology

September 2001

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ABSTRACT

This thesis argues that in a constituent question with a universal quantifier, syntactic reconstruction of the *wh*-phrase below the quantifier is the source of scope ambiguities. In particular, I argue, based on the interaction of PL-readings with binding conditions A and B, that syntactic reconstruction of the *wh*-phrase below the quantifier is necessary for the PL-readings or family-of-questions interpretation to be available. The thesis takes as a starting point the assumption, fundamental to the approaches of May (1985), Aoun and Li (1993), and Chierchia (1993), that *wh*-quantifier interaction is subject to a nesting-crossing asymmetry. Two things are shown in the first two chapters: 1) that the subject-object asymmetry is a relative phenomenon depending on the type of the quantifier used (whether one uses each vs every), and the type of the *wh*-phrase extracted (e.g. a which-phrase vs. a how many-phrase,) and 2), questions with quantifiers exemplifying nesting configurations are in fact unambiguous when reconstruction of the wh-phrase is blocked by binding theoretic principles. The data show that nesting is insufficient, whereas reconstruction is necessary condition for the availability of PL-readings. The proper treatment of wh-quantifier interaction is therefore one that treats the phenomenon in terms of reconstruction.

The second part of the thesis argues that reconstruction is necessary for PL-readings, because such interpretations are a particular case of variable binding in which the universal quantifier binds an implicit variable in one of the copies of the *wh*-phrase, which is analyzed as a skolemized choice function as in Kratzer's (1998) theory of indefinites. It is argued on the basis of empirical considerations that WCO is irrelevant contra Chierchia (1993) because WCO is irrelevant for implicit variables. The third part of the dissertation shows that the reconstruction view of PL-readings opens up the possibility to use such interpretations as a diagnostic for successive cyclicity. This possibility is exploited with a certain degree of success. By comparing the interaction of overtly displaced wh-phrases with quantifiers, on the one hand, and the interaction of wh in situ and universal quantifiers, on the other, it is concluded that whereas overtly moved wh-phrases move in successive cyclic fashion, wh-phrases in situ do not get their scope via successive cyclic movement.

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Acknowledgments.

This dissertation is the result of my interaction with a number of people at both an academic and a non-academic level and their influence is present throughout the document event if it is not related to linguistics.

The whole process could not have been conducted without the guidance and patience of Irene Heim whose meticulous reading of my drafts resulted, always, in fruitful suggestions and counterexamples that helped modified earlier versions of the main hypotheses considerably. Without her patience, my often naive questions would have never evolved into the type of inquiry that I attempt to carry out in this thesis. I thank her for that.

Next, I want to thank the members of my committee for their comments and encouragements. In alphabetical order, they are: Noam Chomsky, Danny Fox, Irene Heim, David Pesetsky, and Norvin Richards.

I originally applied at MIT because of the Charles river, which I first laid my eyes upon in the summer of 1995, while I was attending the regional meeting of the Full-bright scholarship. I pictured myself studying on the benches by the water and thought that that would be better than my usual study place in Arizona. Kai and Sabine very soon taught me that succeeding at MIT would require much more than bathing my eyes in the waters of the Charles and I want to thank them for such a wake up call.

Life at MIT would not have been the same if Sonny Vu, Meltem Kelepir, Vivian Lin, Bridget Copley, Jay Rifkin, and Sveva Besana had not been my classmates.

I want to thank the following linguists for judgments, nice linguistic tricks, important suggestions, or simply for trading thoughts with me on some linguistic phenomenon, or social, or political event. Without any specific order, they are: Ken Hale, Michael Kenstowicz, Cheryl Zoll, Alec Marantz, Morris Halle, Sylvain Bromberger, Howard Lasnik, Michel DeGraff, Norvin Richards, Danny Fox, Shigeru Miyagawa, Sabine Iatridou, Kai von Fintel, Uli Sauerland, Karlos Arregui, Christopher Bader, Teal Bissell, Benjamin Bruening, Elissa Flagg, Paul Elbourne, M. Cristina Cuervo, Elena Guerzoni, Martin Hackl, Susi Wurmbrand, Jon Nissenbaum, Jonathan Bobalijk, Daniel Harbour, Ken Hiraiwa, Franny Hsiao, Michela Ippolito, Markéta Ceplová, Shinichiro

Ishihara, Julie Legate, Lance Nathan, Zhiqiang Li, Tatjana Marvin, Ora Matushansky, Andrew I. Nevins, Liina Pylkkanen, Andrea Rackowski, Meltem Kelepir, Conny Krause, Jay Rifkin, Bridget Copley, Orin Percus, Linnaea Stockall, Shogo Suzuki, and Michael Wagner.

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CHAPTER 3: CYCLICITY AND PL-READINGS IN WH-QUANTIFIER INTERACTIONS.

CHAPTER I: THE PROPER TREATMENT OF SCOPE AMBIGUITY IN QUESTIONS WITH QUANTIFIERS.

0. Introduction.

In generative grammar, the investigation of scope ambiguities has been at the center of research agendas that purport to elucidate the relationship between *linguistic form* and *logical form*, see for instance, May (1977, 1985). This inquiry is, in a sense, a local instantiation of a more global question that has spanned the philosophical literature since the publication of Frege's *Begriffsschrift* in 1879 and the popularization of Russell's influential thesis, at the beginning of the 20th century, that grammatical form (i.e., *linguistic form*) is misleading. Russell's thesis finds that the grammatical form of a sentence and its correspondent logical form(s) may differ in such a way that one can be misled to perceive inferences that are actually not justified.

Among the objectives of linguists and philosopher was then the need to identify and separate the grammatical form of a sentence from its underlying unambiguous logical forms. This need was rediscovered in the sixties and seventies, in the semantico-linguistic literature, when there was a growing optimism about the possibility that linguistic expressions of natural languages could in fact be treated along the lines of corresponding similar expressions in formal languages[1]. The syntactic and semantic treatment of natural language examples with multiple quantifiers, as in (1), provided the occasion for the question to be re-asked:

(1) a. Someone loves every woman

b. $\exists x[person(x) \wedge \forall y[woman(y) \rightarrow L(x, y)]]$

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[1] Among the philosophers of language and logicians, this optimism is explicitly voiced, for instance, in Davidson (1970) and Montague (1970a). Montague's paper begins with a statement of his rejection to the, by then, classical contention that the meaning of natural language expressions is too "chaotic" or "misleading" to lend itself to amenable logical treatment. He put it this way: "I consider it possible to comprehend the syntax and semantics of both kinds of languages within a single natural mathematically precise theory. On this point I differ from a number of philosophers, but agree, I believe, with Chomsky and his associates" (p. 373).

c. $\forall y[woman(y) \rightarrow \exists x[person(x) \wedge L(x, y)]]$

Natural language sentences like (1a) are ambiguous in that they can be translated into either of the two logical formulae in (1b-c). The question of what is the relationship between linguistic expressions like (1a) and their corresponding logical forms, as in (1b-c) became very important especially after it was discovered that the notion of scope, familiar from logic, correlates with the syntactic notion of c(onstituent)- command, used in transformational approaches since the work of Reinhart (1976).

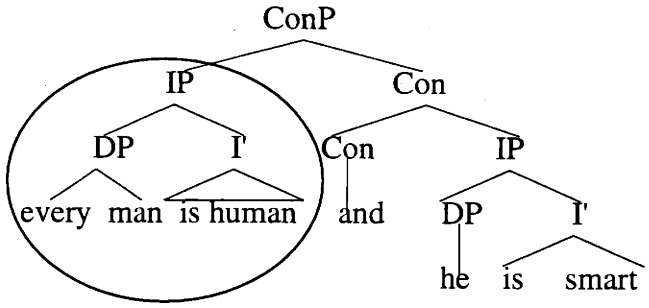
The correlation of c-command with the logic notion of scope can be illustrated by considering the notion of variable binding. In logic, a variable can only be bound by a particular quantifier if it occurs in the scope of the given quantifier. The scope of a quantifier is the extension of the bracket containing the connective associated with it. Similarly, a pronoun in a natural language sentence can only be associated with a quantifier if the former occurs in the c-command domain of the latter. This parallelism is illustrated in (2).

(2) a. $\forall x[M(x) \rightarrow H(x)] \wedge S(x)$

b. Every man is human and he is smart.

In (2a) the universal quantifier can bind the variable in the sub-formulae M(x) and H(x), but not the one in S(x). The scope or bracket of the quantifier in that formula is confined to the first conjunct. The variable in S(x) is a free variable and we can substitute S(x) for S(y) without altering the meaning of (2). Similarly, the determiner *every* in (2b) only c-commands material inside the first conjunct, as can be appreciated in the corresponding tree diagram in (3), and so the pronoun *he* in the second conjunct cannot be understood as bound by that determiner, but has to be interpreted as a free variable. The c-command domain of *every* in (3) is the domain that I have enclosed in a circle.

(3)



The correlation between the syntactic notion of c-command and the logic notion of scope will follow automatically if we define the notion of scope, for natural language quantifiers, in terms of the notion of c-command. This is in fact what May (1977, 1985) does providing, basically, the definition in (4).

(4) Definition of Scope for Natural Language expressions
The *scope* of α is the set of nodes that α c-commands at L,
where L, is some abstract level of linguistic representation.

A problem arises, however, when we apply the definition of scope in (4) to examples like those in (1). In particular if the scope of a quantifier is the set of nodes that that quantifier c-commands, the question is how the quantificational object in (1) can ever have scope over the subject quantifier given the fact that subjects asymmetrically c-commands objects. It seems then that if we want to preserve the definition of scope in terms of c-command, we need to look for a way to account for the facts that sentences with multiple quantifiers are not necessarily scopally rigid. May's answer to this problem was that the definition of scope was relevant at a level of linguistic representation distinct from surface structure, see Chomsky (1976). This postulated level came to be known as *Logical Form* (LF)[2]. The idea was that the structure(s) or Logical Form(s) of sentences at the level of LF, were closer to their logical forms than the surface structures of those sentences were.

[2] The term is conventionally written with capital initials to distinguish it from the term *logical form* used in logic. The term LF ambiguously refers to both a level of syntactic representation taken to feed the semantic interpretation, and to the resulting structure of a sentence once the derivation has been exhausted.

May assumed that the level of LF was transformationally related to the level of surface structure. In particular he proposed a rule of quantifier raising (QR) that targets quantifiers and moves them to their scopal positions[3]. QR was assumed to be a particular instance of the more general transformation known as move α (Chomsky 1981, Lasnik and Saito, 1984) which has the power to move anything anywhere, provided that no grammatical constraints are violated.

With this assumptions, May could explain the ambiguity of (1) while maintaining the definition of scope in (4) in the following way. At the level of LF, the rule of QR can target the object quantifier *every woman* in (1) and move it either above the subject, Chomsky-adjoining it to IP, or below it, adjoining it to the VP. If the former option is executed, the subject will be within the c-command domain of the object, accounting for the reading in (1c), if the latter option is chosen, the subject will c-command the object, accounting for the reading in (1b). The rule of QR, thus, maps the surface structure in (1a) to two LFs, which, in effect, correspond to the two logical formulae associated with that sentence in (1b-c).

This type of analysis raised optimism in semantic studies conducted in the transformational framework at the time since it suggested that, at least at some level of representation, natural language expressions were not as chaotic or ambiguous as philosophers and logician once thought them to be. This led some linguists to entertain the hypothesis, albeit ephemerally, that LF is a level by which natural language expressions are already disambiguated (see for instance May, 1977).

Empirical considerations, however, soon made it clear that the solution to the problem posed by scope ambiguity could not be as simple as the application of the rule of QR, with optional landing sites, at the level of LF. For one thing, when one moves to consider the scopal interaction of other quantifiers, scope ambiguities seem to be constrained by grammatical factors that substantially complicate the simple picture of the

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[3] A very similar mechanism for assigning scope to quantificational NPs had been Montague's (1970b) rule of quantifying-in, which can introduce a quantifier above its surface position provided that it binds a variable in the original position. In a sense, May's rule can be seen as a way of constraining Montague's rule with independently motivated grammatical mechanisms.

QR-at-LF view. An example of the type of scopal interactions that cannot be explained by a simple QR view is that between a universal quantifier and a *wh*-phrase in examples like the following.

(5) Which gift did everyone buy for Wayne?

a. Which is the thing x, such that everyone bought x for Wayne?

b. For every person y, which is the gift x such that y bought x for Wayne?

(6) Which person brought everything for Wayne?

a. Which is the thing x, such that everyone bought x for Wayne?

b. #For every person y, which is the gift x such that y bought x for Wayne?

The sentence in (5) is ambiguous and can be interpreted as either a single question, paraphrased as in (5a), or it can be understood to have the so-called *family-of-questions* interpretation paraphrasable as in (5b). Under the single question interpretation, the sentence can be given a single answer (e.g., by uttering the abbreviated form *this car*). Under the family-of-questions interpretation, the appropriate answer to the question is a pair-list answer (*PL-answer*) in which a list of pairs of people and things they bought is provided. In contrast with (5), however, (6) is not ambiguous being only understood as a single question. If QR has the option at LF to either raise the quantifier below or above the *wh*-phrase, we will be able to generate the two interpretations of (5), but we will be overgenerating readings for the sentence in (6).

Considerations like this one led May (1985) to give up the view that LF is a level at which linguistic expressions are already disambiguated, a view which he held in (1977), and adopt a more complicated view in which QR maps surface structures into LFs that are not disambiguated[4]. He then argue that a scope principle conspire with other

[4] The view that LF is a level at which natural language expressions are already disambiguated is attractive in that it provides a plausible answer to the question of what is the relationship between the linguistic or grammatical form of a sentence, on the one hand, and its correspondent logical form(s), on the other: logical forms are in a one to one correspondence with the LFs of linguistic expressions but not with their surface

grammatical principles (e.g., the ECP) in order to account for scope ambiguities. Many analyses have being offered to explain the proper treatment of scopal interactions since these issues were first studied in transformational grammar in the seventies and eighties, and each new proposal has brought with it new data and phenomena not considered by its predecessors; and new problems have often been discovered. It is fair to say today that the question of the proper treatment of quantifier scope ambiguity in natural language, which has in its background the deeper question of the relationship between linguistic form and logical form, has not been settled yet.

This dissertation is an attempt to revisit the question of the relationship between a sentence grammar and the interpretations the sentence receives in the semantic component of the system. The question can be split into the following family of questions. What is the contribution of grammatical operations to the interpretation of sentences? How is a sentence mapped to its LF(s), and how close to the logical representation(s) of the sentence or lf(s) is a particular LF in terms of quantifier scope ambiguity. I will not address these questions from the vast perspective of the scopal interactions of quantifier phrases in general. Rather, I will use a smaller fragment of the grammar of natural language that concerns the interaction of a *wh*-phrase and a universal quantifier.

By restricting my research to such a fragment, I will be able to examine scopal ambiguities at a deeper level of cross-linguistic research. Cross-linguistic depth of grammatical research is, of course, only a goal in research programs that aim at determining the structure and properties of human language in general.

The rest of this chapter is organized as follows. In the first part of the chapter, sections 1.1-1.4, I will discuss the three most influential treatment of wh-quantifier interactions:

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realization. In May (1985), LFs are as ambiguous as the surface forms from which they are transformationally derived and a Scope Principle interacting with other principles of grammar determines how they are mapped into multiple logical forms. In this new view, LFs are in a one to many correspondence with logical forms. Later in this chapter we will see that Scope Principles cannot account for the data that originally motivated their introduction, and should be dismissed in favor of an alternative analysis of scope ambiguities. It turns out that once scope principles are eliminated from the grammar, one can in fact returns to the view that at some stage in the derivation of a sentence, the correspondent structure is not ambiguous any more.

those of May (1985), Aoun and Li (1993), and Chierchia (1993) in order to provide the necessary background for the main points I will make in this dissertation. I will show that these approaches, share the assumption, fundamental to them, that scope ambiguities in questions with quantifiers are subject to a nesting-crossing asymmetry (usually known as *the subject-object asymmetry*). In particular these approaches assume that nesting licenses scope ambiguities whereas crossing does not. In sections 1.3, and 1.4, respectively, I show that scope-principles-based proposals (e.g., May (1985), and Aoun and Li (1983)), and the weak cross over (WCO) account of Chierchia (1993) do not constitute proper treatments of *wh*-quantifier interaction as they make the wrong empirical predictions in configurations in which nesting is respected, but where reconstruction of the *wh*-phrase below the quantifier is prevented by binding theory.

In the second part of the chapter, sections 2.1-2.7, I will show that even the fundamental assumption of the three approaches discussed, i.e. the assumption that only nesting configurations results in scope ambiguities in *wh*-quantifier interaction, is empirically wrong since there are counterexamples that cannot very easily be dismissed. In section 2.1, I will discuss examples in which the *wh*-phrase is extracted from the subject position, and the universal quantifier in object position is *each*. As it will be seen, such examples are judged ambiguous by native speakers of English.

In section 2.2, and 2.6, it will be shown that examples with a similar structure in which the quantifier *every* is in object position are also judged ambiguous when the *wh*-phrase in object position is less definite than a *which*-phrase (e.g., a how many phrase). The different subsections of section 2.4, show that these examples cannot be dismissed by attributing the ambiguity to the plurality of the *wh*-phrase as in Chierchia (1993). The general conclusion of the chapter is that the proper treatment of *wh*-quantifier interaction must be based on the two facts emerging from the discussion of the chapter: 1) that reconstruction of the *wh*-phrase below the quantifier is necessary for the question to be ambiguous, and 2) that the so-called subject-object asymmetry is a relative phenomenon in that only questions with *presuppositional wh*-phrases (e.g., *which/whose*-phrases) exhibit the putative asymmetry. It is suggested in section 2.6.1, as a preliminary note, that

the relativity of the subject-object asymmetry follows from a restriction which prevents the reconstruction of presuppositional *wh*-phrases in theta-position.

1. THE PROPER TREATMENT OF *WH*-QUANTIFIER INTERACTIONS.

In this part of the chapter, I will discuss the three approaches to wh-quantifier interactions that are, in my opinion, the most influential ones: those of May (1985), Aoun and Li (1993) and Chierchia (1993). These approaches constitute separate attempts to provide what the advocate(s) of each proposal consider to be a proper treatment of scope ambiguities in wh-quantifier interactions. Putting irrelevant details aside, a fundamental assumption of these approaches is that the basic generalization of scope ambiguities in questions with quantifiers is that wh-quantifier interactions are subject to a nesting-crossing asymmetry: ambiguous questions with quantifiers are those in which the chain of the quantifier and that of the wh-phrase do not cross (i.e., in nesting configurations). In keeping with this assumption these approaches propose to characterize wh-quantifier interactions in terms of the combined work of so-called scope principles and some constraint C, taken to be responsible for the basic generalization, or on the sole basis of C itself.

May (1985) and Aoun and Li (1993) exemplify the former case. Both works make use of scope principles and assume some constraint C which they take to be responsible for nesting-crossing asymmetry, which, in turn, they take to be the basic generalization about wh-quantifier interactions. As we will see, in May's (1985) C is Pesetsky's (1982) Path Containment Condition (PCC), whereas in Aoun and Li (1993) C is their Minimal Binding Requirement (MBR). These constraints will be defined below.

The second case is exemplified by Chierchia (1993) who argues that whatever constraint is responsible for weak cross over WCO in natural language, is also responsible for the nesting-crossing asymmetry of ambiguities in wh-quantifier interactions. We will see below that both scope-principle-based approaches and the WCO account of wh-quantifier make the wrong predictions in questions with quantifiers that satisfy nesting, but where the reconstruction of the wh-phrase below the quantifier is blocked. The approaches will also be shown to make the wrong predictions in questions

with quantifiers that seem to contradict the generalization that wh-quantifier interactions are subject to a subject-object asymmetry, as in the case of questions with the quantifier *each*. As we will see, in this last case the WCO account makes an empirical prediction that is not attested, suggesting that wh-quantifier interaction is not constrained by WCO. I begin my survey of the relevant approaches by discussing May's proposal.

1.1. May's View.

May (1977, 1985) was, to my knowledge, the first transformational linguist to consider *wh*-quantifier interactions in terms of the syntax and semantics of the interacting NPs[5]. He considered examples like those in (7)-(8). These examples are like those I gave in (5)-(6), in terms of their structure. I chose the examples in (5)-(6) with *which* phrases rather than *who*-phrases because native speakers judgments support the basic point of May's theory better with those examples than with the examples in (7)-(8). Although I give May's original examples below, the reader should be aware that not all speakers agree with May's judgments regarding examples like those in (7)-(8). In section 2.6. I will make a suggestion concerning the variability in judgment when the wh-phrase is a who-phrase.

(7) a. What did everyone buy for Max? (May, 1985)

b. What is the thing x such that everyone bought x for Max?

c. For each person y, what thing did y buy for Max?

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[5] A qualification is in order here. Åqvist (1975), Groenendijk and Stokhof (1982, 1984), Hirschbühler (1978), Hull (1974), Karttunen (1977), Karttunen and Peters (1980), and Keenan and Hull (1973), all discussed *wh*-quantifier interactions to some extent. It seems to me, however, that these approaches were more concerned with the appropriate model-theoretic treatment of the meaning of the relevant constructions than with the syntax and grammar proper of such structures. I choose May as the point of departure of my research because he is the first, among these researchers, to relate the distribution of scope ambiguity in wh-quantifier interactions to the existence of postulated grammatical principles and phenomena (e.g., the subject-object asymmetry, the ECP).

(8) a. Who bought everything for Max?

b. Who is the person x such that x bought everything for Max?

c. #For each thing y, who bought y for Max?

May noticed that (7a) is ambiguous, allowing at least two different interpretations that can be paraphrased as in (7b-c). Under the interpretation that corresponds to the paraphrase in (7b) the sentence is understood as a single question and can be given the *single answer* (SA) in (9a). Under the reading paraphrased in (7c), that interrogative sentence is understood as a family of question, and can be given the PL-answer in (9b).

(9) a. This Bosendorfer piano

b. Mary, a tie; Sally, a sweater; Harry a piano; ...

May observed, however, that (8a) contrasts with (7) in that it only allows a single question interpretation. That is, that question can be given the single answer in (10), but not the PL-answer in (9b).

(10) Oscar did

Based on this contrast, May developed a view of *wh*-quantifier interactions that has, essentially, been adopted by most researchers working on the resolution of scope ambiguity in questions with quantifiers[6]. The details of this view are essentially the following. May argued that the difference between sentences like (7) and (8) concerns the position of the extraction site with respect to the interacting quantifier. If the extraction site c-commands the quantifier at surface structure, as when a subject *wh*-phrase is

[6] The essential point of May's theory that subsequent approaches have adopted is his claim that the distribution of ambiguity in wh-quantifier interaction is subject to a subject-object asymmetry. The different approaches to scope ambiguity in questions with quantifiers that succeeded May's proposal have all assumed the truth of this claim, with the exception of Williams (1988), all though each different approach has implemented it in different way. We will see later in this chapter that May's claim is not correct and that the explanation usually given to defuse the apparent counterexamples to the subject-object asymmetry do not stand a closer scrutiny.

extracted and the quantifier sits in object position, the sentence is ambiguous. On the other hand, if the quantifier c-commands the extraction site, as when the extracteé is an object and the quantifier sits in subject position, the question is unambiguous. He therefore assumed that the interaction of *wh*-phrases and quantifier phrases (QPs) is subject to what has come to be known as the *subject-object asymmetry*.[7] To account for this apparent generalization, May adopted Pesetsky's (1982) path containment condition given in (11).

(11) Path Containment Condition (PCC) (Pesetsky, 1982)
If two paths intersect, one must contain the other.

May then argue that ambiguity arises when a quantifier is so close to the *wh*-phrase in COMP that no maximal projection intervenes between the two. This will be the case if the quantifier is adjoined to IP. Two quantifiers that are not separated by a maximal projection are said to *m-command* each other. M-command is defined as in (12). Operators that m-command each other are said to constitute a *sigma sequence*. For May, sigma sequences result in ambiguity given his scope principle in (13).

(12) α m-commands β =def if every maximal projection dominating α also dominates β, and β does not dominate α.

(13) The Scope Principle

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[7] . As pointed out in Sharvit (1997) this terminology is misleading since the generalization that May actually wanted to make is that when the chain of a quantifier and a *wh*-phrase cross, the resulting question is unambiguous, but when the chain of the quantifier is contained inside the *wh*-chain, the sentence is ambiguous. The facts that PL-answers are (im)possible depending on whether extraction proceeds from the subject/object position is just a particular instantiation of the nesting-crossing asymmetry. Below, I will continue to use the term subject-object asymmetry, but the reader should bear in mind that I actually mean a *crossing-nesting asymmetry*.

Two operators O_i, O_j in a sigma sequence, are free to take any tipe of scope relation.

With this knowledge in mind, here's how May accounts for the contrast between (7a), and (8a). Let us consider first (7a). At LF, QR has the option to raise the quantifier and adjoin it to IP. Since this option results in a nesting configuration, it is allowed by the PCC. From the IP-adjoined position, the universal quantifier will constitute a sigma sequence and the sentence is predicted to be ambiguous by the scope principle in (13). Consider now what happens in the case of (8a). In this case, QR cannot adjoin the quantifier to the IP node since the resulting chain will intersects, with crossing, the chain of the wh-phrase in COMP and its trace, and the resulting configuration, will be prohibited by the PCC. The only option is to adjoin the quantifier to the VP node, but from that position the quantifier will be too far from the *wh*-operator to form a sigma sequence with it. As a result, the scope principle does not apply and the *wh*-phrase is expected to take broader scope than the quantifier.

May's approach achieves, thus, a certain degree of success in accounting for the distribution of ambiguity in *wh*-quantifier interaction. However, the approach faces several major problems which have motivated other researchers to look for alternative explanations. One of the problems that remains unsolved in this approach is the fact that scope ambiguities obtain even in cases in which the quantifier and the *wh*-phrase are separated by one or more clauses. Consider the following example.

(14) a. Which dancer did Mary say that every candidate danced with __?

b. Some candidate said that every dancer danced with Mary.

c. Which candidate said that every dancer danced with Mary?

The question in (14a) is scopally ambiguous allowing both the PL-answer and the single individual answer. The challenge that (14a) poses for May's approach is to explain how the quantifier in the embedded clause can get close enough to the *wh*-phrase in the matrix clause, in order to form a sigma sequence, given that the scope of a quantifier is

usually clause-bound.[8] A sigma sequence would be necessary, in May's approach, to account for the ambiguity of the sentence. May (1985, 1988) seems not to assume clause-boundedness . However, as Williams (1988) points out, if the quantifier in (14a) could be raised by QR to adjoin to the matrix IP, in disregard of clause-boundeness, nothing will prevent it from doing the same in sentences like (14b-c). However, (14b-c), unlike (14a) are not scopally ambiguous: the only interpretation of (14b) is the one in which the existential quantifier in the matrix clause takes scope over the universal in the embedded clause, and (14c) only allows a single answer.

For this and other considerations that I will not discuss here, researchers felt that May's approach needed to be modified in order to account for the distribution of scope ambiguity in questions with quantifiers. But the generalization that *wh*-quantifier interaction is subject to a subject-object asymmetry was to be inherited by its successors. A good example of this is Aoun and Li's (1993), which I discuss immediately below.

1.2. Aoun and Li's Approach.

Following in May's (1985, 1988) footsteps, Aoun and Li (1993) provided an analysis of *wh*-quantifier interactions. They adopted the generalization that such interactions are subject to a subject-object asymmetry. They proposed a different scope principle incorporating the idea that traces of *wh*-phrases may count for scope. Notice that in a theory where traces count for scope, one might be one step closer to solving the

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[8] Notice that this problem may be solved if one assumes that traces of *wh*-movement can enter into sigma sequences. Under this alternative, the universal quantifier in (14a) would be able to form a sigma sequence with the trace of the *wh*-phrase in the intermediate COMP, but there's nothing comparable for (14b) since the subject existential originates in the matrix clause. May's scope principle will then correctly distinguish between the two cases. It is not clear, however, that the solution will work without messing up the results that May's theory obtains for mono-clausal examples. In particular, given the relevance of the VP-internal subject hypothesis of Koopman and Sportiche (1988), it will also be possible for an object quantifier to adjoin to VP and form a sigma sequence with the VP internal trace; something that will obliterate the distinction that May's theory is designed to capture in the first place. There are also other questions concerning the relations between scope principles and semantic interpretation.

problem that bi-clausal examples like (14) pose for May (but see footnote 7) since some of the traces of the *wh*-phrase in (14a) are in the same clause as the quantifier, but the same is not true of the examples in (14bc) things the higher NPs in those sentences are arguments of the matrix verbs. Aoun and Li's scope principle is given below.

(15) The Scope Principle

An operator Oi can take scope over another operator O_j, iff O_i c-commands part or the entire chain of O_j

Aoun and Li account for the ambiguity of (7a), repeated below, in the following way. The quantifier *everyone* c-commands parts of the *wh*-chain since it c-commands the *wh*-trace and so it can take scope over the *wh*-operator in COMP by the scope principle in (15). At the same time the *wh*-phrase can take scope over the quantifier since it c-commands the entire quantifier chain from the COMP position.

(7) a. What did everyone buy__ for Max? (May, 1985)

b. What is the thing x such that everyone bought x for Max?

c. For each person y, what thing did y buy for Max?

The principle in (15), however, is very powerful and also predicts (8a) to be ambiguous. The structure of (8a) is (16) after QR has applied at LF.

(8) a. Who bought everything for Max?

b. Who is the person x such that x bought everything for Max?

c. #For each thing y, who bought y Max?

(16) [CP who [IP everything [IP t_{who} [VP buy t_{every} for Max]]]]?

In (16), the wh-phrase c-commands the entire chain of everything, and likewise, this quantifier c-commands part of the chain of the *wh*-phrase. Aoun and Li's scope principle then dictates that the sentence associated with such a structure (i.e., (8)) should be

ambiguous contrary to fact. To account for the fact that sentences like (16) are unambiguous, they propose that variable binding is subject to the requirement in (17).

(17) Minimal Binding Requirement (MBR)
Variables must be bound by the most local potential antecedent (A-bar binder)
(Aoun and Li, 1993, p. 19)

Aoun and Li's argument to explain the unambiguity of (8a), with the structure in (16), is the following. Given (17), the structure in (16) is prohibited by the MBR. In that structure, the most local potential A-bar binder is *everything*,[9] but the *wh*-trace is co-indexed with the *wh*-operator by movement in violation of (17). Re-indexing the *wh*-trace with the universal will not fix the problem, but will rather result in vacuous quantification, a situation that arguably leads to ungrammaticality in natural language. Consider now (7), with the structure in (18) after QR has applied at LF.

(18) [CP what did [IP everyone [IP $t_{everyone}$ [VP buy t_{what} for Max]]]]?

To account for the fact that the sentence associated with (18), i.e. (7), is ambiguous, Aoun and Li has to estipulate that not every operator appearing between a *wh*-phrase and its trace counts as a potential binder. In particular, they stipulate that if assigning the index of an operator to a *wh*-trace results in a Condition C violation, that operator does not count as a potential binder. The idea behind this stipulation is that wh-phrases are r-expression in the sense of (Chomsky 1991, 1986) and cannot be bound from an argument position. In (18), if we assign the index of the quantifier to the *wh*-trace, a Condition C violation will follow since the *wh*-trace will be bound by the trace of the quantifier in the [Spec, IP] position, which is an argument position. Given this stipulation, *everyone* does not count as a potential binder in (18) and so the MBR is

[9] Aoun and Li assume that *everything* is adjoined to IP under the two-segment theory of adjunction proposed in May (1985), and Chomsky (1986). That position was taken to be an A-bar position in the government and binding (GB) framework.

irrelevant. The scope principle then dictates the sentence to be ambiguous. The situation is different in (16), the structure of (8), since everyone is in an A-bar position and its trace in argument position does not c-command the *wh*-trace. As a result, assigning the index of the quantifier would not lead to a Condition C violation. What that means is that in that structure, the quantifier counts as a potential binder and the structure is therefore ruled out by the MBR as we already saw above. The MBR together with Aoun and Li's scope principle and the stipulation that only quantifiers in certain positions count as potential binders can account for the contrast between (7) and (8), but we will see in the next section that theories based on scope principles are not adequate to account for the complexity found in *wh*-quantifier interaction in natural language.

1.3. Evaluating Scope-Principles-Based Approaches.

Theories of *wh*-quantifier interaction that make use of scope principles in order to account for the distribution of scope ambiguity, in question with quantifiers, miss the point that scope ambiguity results from the possibility of syntactic reconstruction when the chain of the relevant operators interact in the ways discussed above[10]. For illustration of the point consider the following examples from Spanish. PR is short for *Pat Riley*.

(19)

a. [A cual jugador de su equipo$_k$]$_j$ piensa PR$_k$ que cada fanático acoso t$_j$? (PL)
to which player in his team think PR$_j$ that every fan harassed
'[which player in his$_k$ team]$_j$ does P.R$_k$ think that every/each fan harrased t$_j$'

b. El piensa que el f. alto acosó a Morning; el bajo, a Hardaway; ...
he thinks that the tall fan harassed Morning; the short one, Hardaway; ...

[10] Some of the arguments that I will develop in this dissertation against the approaches to scope ambiguities in questions with quantifiers considered here, have appeared in earlier papers of mine, i.e., in Agüero-Bautista (2000a, 2000b, and 2000c). This thesis can be considered a natural extension of those papers and I will feel free to use both the data and arguments given in those papers without making explicit reference to them.

(20)

[A cual jugador del equipo de PR_k]$_j$ piensa él$_i$ que cada fanatico acosó t_j ? (#PL)
to which player in the team of PR thinks he that every/each fan harassed t_j
'[which player in PR_k's team]$_j$ does he$_i$ think that every/each fan harassed t_j'

Recall that the ambiguity of bi-clausal sentences like (19) were a problem for May's theory when contrasted with sentences like (14b-c), repeated below as (21a-b).

(21) a. Some candidate said that every dancer danced with Mary. (#every > some)
b. Which candidate said that every dancer danced with Mary? (SA, *PL)

In (21a), the universal quantifier in the embedded clause cannot take scope over the existential in the subject position of the matrix clause. Similarly, in (21b), the sentence lacks a PL-interpretation which is taken to arise when the quantifier scopes, somehow, above the wh-phrase. This suggests that in sentences like (19), the PL-interpretation does not arise out of long-distance QR of the embedded universal into the matrix IP, since if that were the case, inverse scope and a PL-reading would be possible for (21a-b), respectively, contrary to fact.

The idea that *wh*-traces may count for scope, which Aoun and Li incorporate into their account, can help explain the contrast between sentences like (19), on the one hand, and sentences like (21), on the other, but it misses the point that traces may count for scope because syntactic reconstruction to the position of the traces is often possible. When reconstruction is impossible, the traces of *wh*-movement will not count for scope. The contrast in (19) and (20) shows this clearly. In (19), the fronted *wh*-phrase contains a pronoun that is co-indexed with the name *Pat Riley* in subject position of the matrix clause. The *wh*-expression in this case has been extracted from the c-command domain of the universal quantifier *cada fanático* 'every fan' in the embedded clause. In this example nothing blocks reconstruction and the sentence has a PL-interpretation. In (20), however, the r-expression appears inside the restriction of the fronted *wh*-phrase and the pronoun with which it is co-indexed is the subject of the matrix clause. Condition C requires that reconstruction does not take place since that would place the r-expression within the c-

command domain of the pronoun. (20) allows a single answer, but not a PL-interpretation.

This suggests that the PL-interpretation of questions with quantifiers arises through reconstruction of the *wh*-phrase, or some part of it, below the quantifier in the sentence. Theories that analyze *wh*-quantifier interactions in terms of scope principles cannot account for the contrast in (19) and (20). This is because scope principles are not contingent on the presence of binding condition effects. I will introduce a reconstruction theory of wh-quantifier interaction in Section 2.5.1 , and will develop it in details in Chapter II. I turn now to consider another influential approach to wh-quantifier interactions.

1.4 The Weak Cross Over (WCO) Account of WH-Quantifier Interaction.

Chierchia (1991, 1993) developed a view of wh-quantifier interactions that is substantially different from scope-principle-based theories like that of May (1985, 1988), and Aoun and Li (1993). Chierchia inherited from his predecessors the subject-object asymmetry as a characterization of the distribution of scope ambiguities in questions with quantifiers. He argued, however, that the nature of this asymmetry should be linked to the phenomenon of Weak Cross Over (WCO). He argues that PL-answers are possible because the trace of *wh*-extraction can be complex containing two variables. One of the variables ranges over individuals, the other, over functions.

In the semantics, the complex trace is translated as f(x). Chierchia argues that under the PL-interpretation, the individual variable gets bound by the quantifier and the function variable gets bound by the *wh*-phrase from the COMP position. He further argues that if the quantifier has to cross over the site of *wh*-extraction in order to bind the individual variable, with which it is co-indexed, the resulting configuration is ruled-out by whatever constraints rule out WCO configurations in natural language. Following Engdahl (1986), he observes that a sentence like (22) is three ways ambiguous, as in indicated below.

(22) a. Who does every man love__?

b. Mary

c. Bill, Mary; Paul, Susan; John, Anna; ...

d. his wife

The answer in (22d) is called a *functional answer*. Chierchia considers the distinction between PL-readings like (22c) and functional readings like (22d) to be the distinction between describing a function intentionally (i.e., the functional reading), or by spelling out the graph of the function (i.e., the PL-interpretation). Both the functional and the PL-interpretation depends on whether the postulated composite trace can be interpreted functionally (i.e., as f(x)).

Here's how Chierchia accounts for the ambiguity of (22). Under the functional interpretation of the *wh*-trace there is an implicit variable adjoined to the *wh*-trace that can be bound by the universal quantifier *every man* from the [Spec, IP] position. Binding is possible in this case because the *wh*-word is extracted from the c-command domain of the quantifier and so the latter does not have to cross over the extraction site to bind the implicit variable. In the reverse case, however, that is, when extraction proceeds from the subject position and the quantifier is in object position, the quantifier will have to cross over the *wh*-trace to bind the implicit variable. But that will be penalized by whatever constraints rules out WCO configurations. The only alternative in this case will be to ignore the implicit variable in which case only the single answer will be possible, as the trace will have to be interpreted as ranging over individual variables.

Chierchia theory enjoys the advantage that it relates the distribution of *wh*-quantifier interaction to an independent phenomenon of the grammar: WCO. However, by linking the explanatory burden of the theory to certain properties of *wh*-traces, the theory, like its predecessors, is also missing the point that traces matter because of the possibility of reconstruction. To this effect, the WCO view is subject to the same criticism that its predecessors were subject to. In particular, contrasts like those between (19)-(20), where the PL-interpretation clearly depends on the possibility of reconstruction, will constitute a problem for the WCO theory because the existence of the complex traces that the theory postulates is not contingent on the possibility of syntactic

reconstruction. As a result the WCO view predicts sentences like (19)-(20), where the *wh*-phrase has been extracted from the c-command domain of the quantifier while leaving a complex trace, to be ambiguous even when reconstruction is blocked. Given the unambiguous status of sentences like (20), this prediction is obviously incorrect.

1.4.1 An Unattested Prediction of the WCO Account.

Despite the virtues that the WCO account of scope ambiguities in question with quantifiers has, it makes an empirical prediction that when examined turns out to be incorrect. Since functional and PL-interpretation are argued to be constrained by whatever mechanism constrains WCO, Chierchia's approach predicts that if a given speaker has WCO effects in his or her grammar involving a particular quantifier, then the same person should not allow PL-interpretations in questions where the extraction site c-commands the given quantifier. That is, the WCO approach predicts that for a speaker for which the judgment in (23a) is true, the judgment in (23b) must be false:

(23) a. *?his teacher recommended each student.
b. Which teacher recommended each student. (PL OK)

All my informants find some kind of deviance with (23a), which should obviously be attributed to WCO, but none of them find that (23b) lacks a PL-reading. In fact, there is a consensus that the PL-interpretation of (23b) is a rather prominent reading of that sentence. The correlation predicted by Chierchia's approach, thus, does not obtain, and contrasts like that in (23) strongly indicate that the distribution of scopal ambiguities between quantifiers and *wh*-phrases should not be related to WCO.

Chierchia does not discusses questions with *each*, which makes me suspect that he assumes that some kind of explanation might be available that can explain the apparent exceptional behavior of *each* while still been consistent with the WCO approach. It is difficult to see, however, what the explanation would be. Notice, for instance, that given the judgment reported for (23a), it cannot be the case that WCO

effects are simply suspended with the quantifier *each* as suggested, for instance, in Comorovski (1996).

1.5 Summary.

So far we have examined the three most influential approaches to wh-quantifier interactions in generative grammar: those of May (1985, 1988), Aoun and Li (1993), and Chierchia (1991, 1993). We saw that these approaches share a fundamental assumption: that scope ambiguity in questions with quantifiers is constrained by a nesting-crossing asymmetry often referred to as the *subject-object asymmetry*.

The first two approaches make use of so-called scope principles in order to account for scope ambiguities in question with quantifiers. In section 1.3, we saw that scope principles are not enough to account for the intricacies of wh-quantifier interactions. In particular, that section shows that cases in which Condition C forces a *wh*-phrase to remain in the COMP position lack the PL-interpretation even when extraction has proceeded from the c-command domain of the quantifier. Scope principles make the wrong prediction here, since such principles are not contingent on the effects of binding conditions.

The third approach (i.e., Chierchia's) argues that wh-quantifier interaction is related to WCO. In section 1.4., we saw that this proposal predicts incorrectly that speakers for whom (23a) is bad, there should not be a PL-interpretation available in (23b). In addition, contrasts like those in (19)-(20), where reconstruction has an effect on the ambiguity of questions with quantifiers in the absence of WCO configurations, pose the same problem for Chierchia's approach as for those of May's and Aoun and Li's.

These problems by themselves suggest that one should look for a more empirically adequate account of wh-quantifier interaction. This conclusion will be reinforced in the next section, where I will show that there are outstanding problems concerning the assumption that wh-quantifier interaction is subject to a subject-object asymmetry, an assumption which is fundamental to the three major approaches discussed above.

2. Problems With the Subject-Object Asymmetry.

This part of the chapter is devoted to show that the fundamental assumption of the three approaches discussed in part 1, i.e., the assumption that wh-quantifier interaction is subject to a subject-object asymmetry is factually wrong. I will show that there are questions where extraction site is in the subject position and the quantifier is in the object position that are ambiguous.

In section 2.1, I discuss cases with the quantifier each. In subsequent sections, I show that questions with the same structure, but with every in object position are also ambiguous and that their ambiguity cannot be attributed to the plurality of the wh-phrase as argued for instance in Chierchia (1993). It will be shown that the subject-object asymmetry is a relative phenomenon only found in questions with quantifiers in which the wh-phrase is definite in ways to be made explicit below.

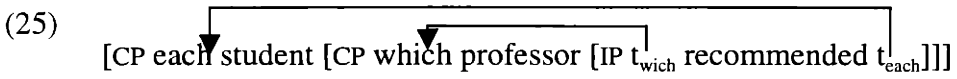
The conclusion of this part of the chapter is that the proper treatment of wh-quantifier interaction should not be based on the assumption that the subject-object asymmetry is a general phenomenon. I begin my survey of the problems that an approach that assumes the subject-object asymmetry faces, by discussing questions with the very distributive quantifier *each*.

2.1. Problems with the Quantifier *Each*.

The assumption that the distribution of ambiguities in questions with quantifiers could be characterized in terms of the so-called subject-object asymmetry, has not been shared by all the researchers on the topic. Willams (1986, 1988) has called the attention to questions that instantiate crossing in the sense of May (1985, 1988), but where the quantifier involved is *each* rather than *every*. It seems that besides the single answer interpretation, the PL-interpretation is very prominent in those examples:

(24) Which professor recommended each student?

(25)

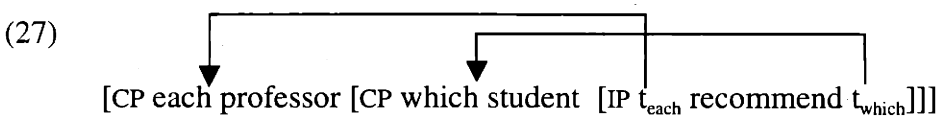


May (1985, 1988) had already noticed the existence of examples like (24). However, he dismissed them by claiming that the PL-interpretation of such examples could be accounted for by assuming that *each* is "inherently focused". He then assumes that focused NP must move past the *wh*-phrase to adjoin to the CP node dominating it at S-structure. The result will be a nesting configuration in which the chain of the object quantifier contains the chain of the *wh*-phrase extracted from the subject position as illustrated in (25), the LF structure for (24), under that idea.

However, Williams (1988) shows that May's solution does not solve the problem that *each*-NPs pose for the nesting-crossing asymmetry that the latter postulates in the distribution of PL-answers. In particular, obligatory movement of *each*-phrases to adjoin to CP, as suggested by May, will only reverse the syntactic contexts in which crossing will occur. That is, if a quantifier is only allowed to move to IP, as in May's treatment of *every*, crossing will occur when the extraction site c-commands the quantifier at spell-out. On the other hand, if a quantifier is required to adjoin to CP, as in May's suggestion for *each*, crossing will occur in the opposite situation: when the quantifier c-commands the extraction site. This is illustrated with the example in (26) and it's correspondent LF in (27).

(26) Which student did each professor recommend (SA, PL)

(27)



This is an unfortunate state of affairs since now May's theory predicts that sentences like (26) should not allow a PL-answer[11]. This is a very unwanted prediction given that native speakers of English in fact find that the PL-reading interpretation is more readily accessible in sentences like (26) than in similar sentences involving *every*.

May's suggestion, then, rather than explaining away the availability of PL-interpretations in questions with *each*, when the *wh*-trace c-commands the QP by spell out, seems to solidify the status of sentences like (24) as clear counterexamples to the claim that the distribution of the relevant interpretations is constrained by his postulated nesting-crossing asymmetry. I will assume that (24) is, in fact, a counterexample to the subject-object asymmetry. I will defer an explanation of the difference between *each* and *every* to Chapter II, where I will develop a reconstruction view of *wh*-quantifier interactions.

2.2. Problems with the Quantifier Every.

Even if the cases with the quantifier *each*, discussed in the previous section, could be accounted for in some way or another by the previous approaches, which assume a subject-object asymmetry in *wh*-quantifier interactions, questions like those in (28)-(29) would still need to be properly accounted for:

(28) a. $[\text{Who}]_k$ t_k put everything on the platter? (PL OK)
b. Bill, the chicken salad; Frank, the chowmein; ... (Chierchia, 1993)

(29) a. $[\text{Who}]_k$ t_k took every guest_j to his_j room last night? (PL OK)
b. Bell boy 1, Mr. Smith; Bell boy 2, Ms. Jackson; ...

Both of the questions in (28) and (29) can be given PL-answers as indicated in (28b) and (29b). This time, however, the quantifier involved is *every*, so it seems that the fact that

[11] In fact, if *each* is required to adjoins to CP, sentence (26) will only be associated with a crossing configuration and the sentence is plainly predicted to be ungrammatical. I thank Danny Fox for pointing this out to me .

PL-readings can occur in structures in which the extraction site c-commands the quantifier is not an exclusive property of the quantifier *each*. If (28)-(29) cannot be explained away, we will have to conclude that approaches that frame *wh*-quantifier interactions in terms of a nesting-crossing asymmetry are fundamentally wrong. So let us consider in detail, in the next section, the explanation that is generally given in the literature in order to account for the PL-readings in examples like (28), while still maintaining that such interpretations are constrained by a nesting-crossing asymmetry.

2.3 The Plurality Hypothesis.

The explanation commonly given in the literature to account for the PL-interpretations of examples like (28), without giving up the posited nesting-crossing asymmetry, is that such examples allow the relevant readings because *wh*-phrases like English *who* and *what*, although morphologically singular, can be semantically plural (see May (1985, 1988); Chierchia (1993), and references therein).[12] Chierchia (1993), following Krifka (1992) and Srivastav (1992), is the author that more explicitly voices the argument. The argument goes as follows. Since Scha (1981) it is known that sentences containing two or more plural DPs allow for a *cumulative* or *co-distributive reading* in which the terms seem to distribute over each other, as shown below.[13]

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[12] At this point I should point out that a common trend in the literature in *wh*-quantifier interaction has been to use quantifiers of the *everyone/everything* type which sometimes enforce a groupe or plural reading. The plurality account was developed for examples like (28). In this section I will also discuss examples containing quantifiers of the form *every*-NP in constructions where the quantifier is allow to bind a variable as in (29). I will show that the conclusions of the plurality accounts for examples like (28), does not extend to examples like (29), which also allow PL-interpretation. In fact, in the plurality account, as we shall see, both the *wh* and the quantifier must be plural for the sentence to allow a plurality-based list reading. We shall see that whereas it may be plausible to assume that quantifiers of the everyone type bear a plural feature, quantifiers of the *every*-NP type do not seem to bear such a feature.

[13] Scha (1981) uses the term *cumulative*, Sauerland (1998), and Sternefeld (1998) use the term *codistributive* to refer to the relevant reading, I will use the term interchangeably.

(30) a. In this picture of the dance group, **[the men are facing the women]**.

b. For all men x, there is a woman y that he faces, and for all women y, she is being faced by a man x

(31) a. The students solved the problems.

b. For all student x, there is a problem y that he solved, and for all problem y, there is a student x that solved it.

As Scha observes, a sentence like (30a) does not necessarily have a universally quantified construal in which all the women are facing all the men. One prominent reading of (30a) is the one in which each man is facing only one woman and vice versa. In this reading each term is treated as a universal quantifier scoping over the other term construed existentially, at a time, and the result is conjoined giving the flavor of co-distributivity in the paraphrases in (30b), see Beck (1999) and Beck and Sauerland (2001).

Similarly, the cumulative or co-distributive reading is also found in (31). The sentence is true in a situation in which every student solved at least one problem, and in which every problem got solved by at least one student. How does this relate to our discussion of ambiguities in *wh*-quantifier interactions? Krifka (1992) shows that because of the cumulative interpretation of a sentence like (31), for instance, a speaker can choose to be more informative by expanding the sentence as in (32).

(32) More exactly, Meltem solved the syntax problem; Conny, the phonology problem; and Bridget, the semantics problem.

Notice that (32) is basically a PL-interpretation. That is, a reading in which the graph of a function mapping students to problem they solved is spelled out. Importantly, however, (32) is not a possibility made available by syntax, but by pragmatics. In fact, it seems that this type of interpretation does not depend on syntactic configurations of the

kind associated with quantifier scope (see Srivastav (1992))[14]. Chierchia applies Krifka's (1992) and Shrivastav's (1992) observations to his analysis of questions with quantifiers. His explanation of questions like (28), repeated below, is, I think, the following.

(28) a. $[\text{Who}]_k$ t_k put everything on the platter? (PL OK)
b. Bill and Frank (put everything on the platter)
c. Bill, the chicken salad; Frank, the chowmein; ...

Strictly speaking, (28a) only allows the single answer in (28b), i.e. the sentence *Bill and Frank put everything on the platter.* The person confronted with the question in (28a), however, has the pragmatic choice to be more informative spelling in more details how the placing of the things happened. This choice is exercised in (28c). However, (28c), is independent of any syntactic configuration and as such is still consistent with the nesting-crossing asymmetry assumed in Chierchia's work. Thus, although his approach predicts sentences like (28a) to lack a PL-interpretation since the quantifier would have to cross over the *wh*-trace, it allows it to have the relevant interpretation when the *wh*-phrase is plural.

Notice that this argument can also work for May's (1985, 1988) approach, and for Aoun and Li's (1993) account as well. If questions with quantifiers in which crossing is involved only allow PL-readings when the *wh*-phrase is plural, and if such readings are independent of any particular syntactic configuration, then such interpretations are still consistent with the nesting-crossing asymmetry that constitute the basis of all these approaches.

The plurality account of the PL-reading of examples like (28) seems to work well at first sight. However, when one submits the predictions of such an account to more

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[14] Notice for instance that whereas the scope ambiguity in questions with quantifiers like those in (5)-(6) is subject to a subject object asymmetry in the extraction of the *wh*-phrase, the following examples are both ambiguous regarding of the position of the *wh*-phrase and the quantifier. (ia) is from Shrivastav (1992).

(i) a. Who loves these men? (*SA, PL*)
b. Who do these men love? (*SA, PL*)

rigorous cross-linguistic scrutiny, a school of problems starts to emerge showing that such an analysis is in the wrong track. I will discuss the problems in subsequent sections.

2.4. Problems with the Plurality Account.

This section will discuss four problems that the plurality hypothesis faces. The first problem to be discussed has to do with the fact that in languages like Spanish singular who-phrases extracted from the subject position can interact scopally with a universal quantifier of the *every* type in object position and so the ambiguities in such cases cannot be attributed to the plurality of the wh-phrase. In section 2.4.2, it will be shown that there are questions with the quantifier every that are ambiguous without having a nesting configurations and in which the ambiguity cannot be attributed to cumulative readings, as entailed in the plurality hypothesis, given standard assumptions on what constitutes a necessary environment for cumulative interpretations. The subsequent sections will all reinforce the conclusion that ambiguity of questions with quantifiers like (28) cannot be attributed to the plurality of the wh-phrase and are, therefore, counterexamples to the subject-object asymmetry.

2.4.1. The Double Plural Requirement (DPR).

The first problem that I will discuss is based on the fact that as observed by Scha (1981), and Srivastav (1992), cumulative readings require the two terms participating in the co-distributive interpretation to be plural. Thus, consider the effect of dropping the plural marking morpheme in (30)-(31) to yield (33)-(34).

(33) In this picture of the dance group, [the men are facing **the woman**].
#For all men x, there is a woman y that he faces, and for all women y, there is a man x facing her[15].

[15] One might hypothesize that sentences like (33), for instance, in fact allow a trivial cumulative reading in which the domain of universal quantification in the second conjunct of the paraphrase contains the one and only one (salient) woman, where one has

(34) The students solved the **problem**.

#For all student x, there is a problem y that he solved, and for all problem y, there is a student x that solved it.

The examples in (33)-(34), where there is only one plural term, do not allow for a cumulative interpretation as in the paraphrases given for those sentences. It seems then that cumulative readings are subject to what I will call a *double-plural requirement* (DPR). Given this, any theory assuming that the PL-interpretation of questions with quantifiers involving *who/what*-phrases is related to cumulative readings, when the extraction site c-commands the quantifier, must first address the question of whether the DPR is met in the relevant sentences. I will ask this question in the next section, where I will discuss certain aspects of *wh*-quantifier interactions in Spanish. In particular, I will show that in Spanish, questions with quantifiers where the DPR is not met are still ambiguous allowing PL-interpretations. This finding strongly suggests that PL-readings of questions structurally identical to (28) cannot be related to cummulative readings and remain, therefore, as counterexamples to approaches of *wh*-quantifier interactions based on the nesting-crossing asymmetry.

2.4.1.1. Spanish Who-phrases and PL-interpretations.

Spanish is different from English in that the equivalent of a *who*-phrase in the former language is morphologically marked for number. *Quien* 'who singular' requires

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dropped the uniqueness presupposition, as is the case with the sentence *all even primes are smaller than 12 is true* (thanks to Noam Chomsky for pointing out this to me). But notice, however, that if we treat the singular definite description as being a universal quantifier with scope over an existential, as in the cumulative reading in the paraphrase, by dropping the uniqueness presupposition; the sentence will be predicted to be true even in situations where there are more than one woman. This is an incorrect prediction, since the intuition about (33) is that the sentence is not true (being either false or having a truth value gap) if uttered in a situation where there are more than one woman. This result indicates in my opinion, that sentences like (33)-(34) do not in fact allow for cumulative interpretations (cf. Srivastav 1992).

singular agreement with the verb whereas *quienes* 'who-plural' requires plural marking on the verb, as shown in (35). Notice that *quienes* is ***quien*** (the question word) + ***s*** (the plural morpheme), the [**e**] is the epenthetic default vowel of the language[16]. The plural morpheme is highlighted.

(35) a. ¿Quien es él?
'who is he?'

b. ¿Quien**es** son ellos?
'who are they?'

c. *¿Quien son ellos?
'who-sing. are they

The contrast in (35) shows that *quien* is morphologically singular: it requires singular agreement with the verb. *Quien* is also semantically singular, as shown by the fact that it cannot be the argument of a collective predicate like *meet*, or *eat together*:

(36) a. El comité comio junto hoy
'The committee ate together today'

b. El equipo se reunio en la biblioteca
The team cl-met in the library
'The team met at the library'

(37) El equipo se reunieron el sabado
the team cl-met-pl. the saturday
'The team met on Saturday'

[16] See Harris (1979, 1983) for the epenthetic status of Spanish [e] in the plural *-es* form of the plural suffix.

(38) a. *¿Quién comió junto hoy?
'who ate together today?'
b. *¿Quién se reunió en la biblioteca?
who cl-met in the library
'Who met at the library?'

(39) *Quien se reunieron el sabado
who cl-met-pl. the saturday
'who met on Saturday'

(40) a. ¿Quiénes comieron junto hoy?
who-pl. ate together today
'Who ate together today?'
b. ¿Quiénes se reunieron en la biblioteca?
who-pl. cl-met in the library
'Who met at the library ?'

(36) shows that in Spanish, collective nouns like *el equipo* 'the team' or *el comité* 'the committee' can be the arguments of predicates that require their arguments to be semantically plural like *comer junto* 'eat together' or *reunirse* 'meet', without entering into plural agreement with the predicates. (37) shows that, at least in some dialects of Spanish, the predicate can be marked for plurality when predicated of a collective noun. By contrast, the ungrammaticality of (38) and (39) show that the interrogative word *quien* 'who-singular' cannot be used with a collective predicate regardless of whether the predicate is marked for plurality or not.

Grammaticality is restored in examples like (38)-(39) if the plural morpheme ***s*** is added to the *wh*-word and the correspondent agreement is added to the verb as in (40). What (36)-(40) shows, then, is that *quien* is both morphologically and semantically singular, and that to make it plural we need to explicitly add the plural morpheme *s*. This in turn means that a question with *quien* and an object universal quantifier does not

satisfy the DPR, discussed in the previous section, even if the quantifier has a plural feature. Given the singular status of *quien* and the DPR, interrogatives with that question word in the subject position and an object universal DP should not allow PL-readings according to the plurality hypothesis that Chierchia and others use as explanation for the existence of list answers in questions with the structure of (28). This prediction, however, is incorrect:

(41) a. Quién le regaló a toda mujer$_k$ en tu clase su$_k$ sortija de boda?
who cl- gave to every woman$_k$ in your class her$_k$ ring of wedding
'Who gave every woman in your class her wedding ring?'

b. Miguel se la regalo a Maria; Pedro, a Julia; ...
Miguel cl-cl-gave to M.; P to J.
'Miguel gave it to Maria; Pedro, to Julia

(41a) can be answered as in (41b) without any difficulty. The PL-interpretation in questions like (41) is rather prominent if one lets the quantifier bind a variable to get the group reading, that quantifiers like *todo* 'every' usually involve, out of the way. Interestingly, Spanish *quien*, like English *who*, contrasts with more specific *wh*-phrases of the *which*-type. Thus the PL-interpretation is not available if we replace *quién* in (41) for *que/cual-persona* 'which person' to yield (42)[17]

(42) a. cual/que persona le regaló a toda mujer$_k$ en tu clase su$_k$ sortija de boda?
which/what person cl- gave to every woman$_k$ in your class her$_k$ ring of wedding
'Which person gave every woman in your class her wedding ring?'

[17] The equivalent of English which-phrases in Spanish are formed with the determiners que 'what' and cual 'which' plus a Noun Phrase. Some dialects allow both who-phrases of the form *que*-NP, and cual-NP without any relevant distinction. In my dialect, wh-phrases of the form que-NP, although usually D-linked in the sense of Pesetsky (1987), still allow for a " what type" or "what kind of" reading, unlike *wh*-phrases of the form *cual*-NP which only allows D-linked readings. I will use both type of *wh*-phrases in my examples, but the reader must bear in mind, that phrases of the form *que*-NP are to be taken in their D-linked interpretation in the examples below.

Unlike (41a), (42) cannot be answered as in (41b). This contrast shows that the distinction between *who/what*-phrases on the one hand, and the more definite *which*-phrases, on the other, in their capacity to support PL-interpretations when extracted from the subject position, cannot be one of semantic number as assumed by the plurality hypothesis. I will suggest a way to characterize the difference between the two types of *wh*-phrases as it relates to scope ambiguities in section 2.6. Let us consider now another manifestation of the DPR problem.

2.4.1.2. Questions with Quantifiers of the Form *Every*-NP and the DPR.

The question that I will address in this section is the following. Do English interrogative sentences with *who/what*-phrases and universal object NPs meet the DPR generally? We are asking this question because cumulative readings are subject to the DPR (Scha (1981), Srivastav (1992)), as mentioned before, and so, if the PL-reading of questions like (28)-(29), repeated below, is related to cumulative readings, as the plurality hypothesis entails, it must be because the DPR is somehow met in such structures.

(28) a. $[\text{Who}]_k$ t_k put everything on the platter? (PL OK)
b. Bill and Frank (put everything on the platter)
c. Bill, the chicken salad; Frank, the chowmein; ...

(29) a. $[\text{Who}]_k$ t_k took every guest$_j$ to his$_j$ room last night? (PL OK)
b. Bell boy 1, Mr. Smith; Bell boy 2, Ms. Jackson; ...

At first sight, it seems that the DPR is indeed met in this type of questions since English *who/what*-phrases and universally quantified NPs of the form *everything/everyone* appear to have a semantic plural feature:

(43) a. Who gathers in room 203?

b. Who is meeting in The White House on the week-end?

(44) a. Everything is gathering in the center of the room

b. Everyone is gathering in the center of the room

(45) (In this company)

a. Everything works together to produce high quality products.

b. Everyone works together to produce high quality products.

These examples show that both *who*-phrases and universal NPs of the *everything/everyone* type appear to have a plural feature since they co-occur with collective predicates like *gather*, or *work together*. However, universal DPs of the form *every*-NP are different from quantifiers of the *everything/everyone* kind in that they cannot occur with collective predicate.

(46) *Every boy is gathering in the center of the room

(47) (In this company)

*Every employee works together to produce high quality products

The contrast between (44)-(45), on the one hand, and (46)-(47), on the other, suggests that quantifiers of the form *every*-NP do not have a plural feature. This means that a question with a quantifier of this form involving a di-transitive predicate will not satisfy the DPR. The plurality hypothesis then predicts that a question involving a subject *who/what*-phrase and an object universal of the *every*-NP kind will not allow a PL-interpretation. We already saw that this prediction is incorrect when we considered examples like (29), repeated below.

(29) a. $[\text{Who}]_k$ t_k took every guest_j to his_j room last night? (PL OK)

b. Bell boy 1, Mr. Smith; Bell boy 2, Ms. Jackson; ...

The interim conclusion that I will draw from these facts is that PL-interpretation of questions like (29), which are identical in structure to (28), has nothing to do with cumulative readings or the plurality of the *wh*-phrase. The plurality account therefore is not enough to dismiss such examples as clear counterexamples to the subject-object asymmetry. We therefore needs an account of wh-quantifier interaction that is not based on the assumption that scope ambiguity is subject to a subject-object (i.e., nesting-crossing) asymmetry. In the next section, I will discuss facts involving weak islands that will corroborate this conclusion.

2.4.2 Cumulative Readings vs. PL-interpretations in Weak Islands Contexts.

One of the problems that the plurality hypothesis account faces is the fact that cumulative readings and PL-readings in questions like (28)-(29) exhibit different behaviors in the syntactic environment of weak islands (WIs). Thus, while sentences with two plural terms separated by a WI allow for a cumulative reading in which the two terms appear to take scope outside the island, questions with quantifiers where the *wh*-phrase is separated from the quantifier by a WI do not have the PL-interpretation. Consider the following examples.

(48) a. These boys didn't bring the things that we were expecting.
b. More exactly, Bill didn't bring the lasagna, and John didn't bring the tofu

(49) a. Tyson and de La Hoya failed to defeat Hollyfield and Trinidad (as expected)
b. (More exactly) Tyson failed to defeat Hollyfield, and de la Hoya failed to defeat Trinidad

(50) a. Who didn't take every guest to his room?
b. Bill
c. #Johnny, Ms. Smith; Peter, Mr. Jones; ...

(51) a. Who failed to put everything on the platter?

b. Bill

c. #Johnny, the chicken salad; Frank, the chowmein

The a-examples in (48)-(49) can be expanded as indicated in the b-examples. Thus, (48b) for instance, expands (48a) by specifying for every boy, the thing that he was expected to bring. Clearly in this reading both the definite plural NPs are taking scope over negation. These facts are consistent with an observation made in Sauerland (1998), and Beck (1999), who observe that for cumulative readings to be available, the relevant terms must take the same scope in that nothing can intervene between them[18]. Sauerland illustrates this with examples like the following.

(52) a. John and Bill expected Sue and Linda to win.

b. #John and Bill expected that Sue and Linda would win.

c. #John and Bill had the expectation that Sue and Linda would win.

Sauerland points out that in a situation in which Sue and Linda are participating in a game that must have only one winner, the sentence in (52a) can be true, but (52b-c), can only be true if John and Bill has not understood the game. For the reading that makes (52a) true, under the situation just discussed, the definite NP *Sue and Linda* takes scope together with *John and Bill* over the predicate *expect*. Clause-boundedness prevents a similar co-scope in (52b-c), and so the cumulative reading is missing in those sentences.

Notice that in the case in which a WI intervenes between a wh-phrase and a quantifier of the *every* type, as in (50) and (51), co-scope is not possible since every fails to scope over negation, and scope reconstruction down WI is not possible (cf. Longobardi 1991). The family of questions interpretation for those interrogatives is not possible. If

[18] This statement refers to intervention in terms of scope not surface intervention. For instance, although negation intervenes the plural terms in (48) in that it is spelled-out between the two terms, it doesn't intervenes at the level where scope is calculated, since under the cumulative reading, both plural terms take scope above the negative operator (see Sauerland 1998 and Beck 1999 for extensive discussion on similar examples).

PL-interpretations involving subject *who/what*-phrases and object quantifiers of the *every* type were the result of cumulative readings as argued by proponents of the plurality hypothesis, it would be a mystery why the latter type of readings can occur in WI contexts whereas the former cannot.

A way to explain the contrast between (48)-(49), on the one hand, and (50)-(51), is to assume that whereas other DPs occurring under the scope of negation can take scope over that operator at LF, quantifier of the *every*-type cannot even if the quantifier in question is of the *everything/everyone* type, as in (51), which we saw in the previous section seems to have a semantic plural feature. This assumption seems necessary, independently, to account for contrasts like the following discussed in Beghelli and Stowell (1997).

(53) a. **Someone** did not meet **every candidate** ($\exists > \neg > \forall$; $*\forall > \exists > \neg$)

b. **Someone** did not meet **each candidate** ($\exists > \neg > \forall$; $\forall > \exists > \neg$)

(53b) allows a reading in which the universal quantifier takes scope over the subject existential NP, which in turns takes scope over negation. This reading is missing from (53a). Since *every* and *each* are both universal determiners, sharing the relevant semantic properties of universal quantification, it seems implausible that negation blocks extraction of *every*, but not of *each*. It must be, then, that it is part and parcel of the syntax of every, that that quantifier does not move higher than the position of negation in the clause. This means, that with or without negation, the syntax of object *every* keeps it in a position that is below negation and the subject of the clause. This means that even in positive questions with subject *who/what*-phrases and object quantifier of the *everything/everyone* type, the quantifier will be to low in the structure of the clause to produce a cumulative readings despite its plural feature.[19]

[19] Recall Sauerland's (1998) observation that the two terms participating in a cumulative reading must take the same scope. This will be impossible if one of the terms is in the subject position and the other term is well below that position in the structure.

It should be noticed now, that in questions with plural subject *wh*-phrases and object plural definites, the list reading (via cumulativity) is available. Again this confirm our suggestion that the real distinction is the syntax of *every*-quantifiers, as opposed to the syntax of other noun phrases like *each*-phrases and definites.

(54) a. Which bell boys didn't take these guests to their rooms (as expected)?
b. John and Peter.
c. (More exactly) Johnny didn't take Ms. Smith, Peter didn't take Mr. Jones;...

(55) a. Who failed to defeat Hollyfield and Trinidad (as expected)?
b. Tyson and de La Hoya?

2.4.3 Cumulative Readings, PL-interpretations, and Exhaustiveness.

Another problem in the way of the plurality hypothesis is the fact that cumulative readings and the PL-interpretations of questions with quantifiers exhibit different behavior with respect to the notion of *exhaustiveness*.[20] Exhaustiveness is a property of wh-complements in that a person who has knowledge of the meaning of an indirect question seems to have de-re knowledge of the elements in the extension of the predicate in the construction. This is known as *weak exhaustiveness*. Groenendijk and Stokhof (1984) argue that a person, besides knowing the elements in the extension of the predicate, must not mistakenly believe of elements that are not in the extension of the relevant predicate, that they are in the extension of the predicate. This is known as *strong exhaustiveness*. Exhaustiveness in its two degree is illustrated in (56)-(57).

(56) John knows who smokes
Mary and Bill smoke
Therefore: John knows that Mary and Bill smoke.
(Weak Exhaustiveness)

[20] See Groenendijk and Stokhof (1984) and references therein for a detailed discussion of this notion.

(57) John knows who smokes
Mary smoke, but Bill doesn't smoke
Therefore: John knows that Mary smokes and John doesn't smoke.
(Strong Exhaustiveness)

Of relevance to our discussion is the fact that knowledge of the PL-interpretation of a question with quantifier is exhaustive in that it requires complete knowledge of the graph of the function mapping elements in the domain of the quantifier to the elements in the domain of the wh-phrase. However, knowledge of the answer to a question under a cumulative interpretation does not seem to be exhaustive. To illustrate this point consider the situation in (58) and the sentences in (59)-(60).

(58) John knows that the Bellboys took the guests to their (the guests's) rooms last night but he does not know who exactly took whom to his her room.

(59) John knows who took every guest$_k$ to his$_k$ room (**False**)

(60) John knows who took these guests/Bill and Mary$_k$ to their$_k$ room last night (namely the bellboys) (**True**)

(59), checked against the situation in (58) is clearly false. My informants feel that for (59) to be true, John must know the complete graph of a function pairing each element in the domain of the quantifier with an element in domain of the *wh*-phrase. By contrast, (60), where the wh-complement allows a cumulative reading, can be true under the same situation (58). This judgment is specially clear if one considers the parenthetical expression in (60), i.e., *namely the bellboys*. Notice now that if Ms. Smith is one of the relevant guests, (61) is a contradiction, but (62) isn't:

(61) #John knows who took every guest$_k$ to her$_k$ room, but he doesn't exactly know who took Ms. Smith to hers.

(62) John knows who took the guests$_k$ to their$_k$ room last night (namely the bellboys), but he doesn't exactly know who took Ms. Smith to hers.

Because knowledge of a question under the PL-interpretation involves exhaustive knowledge of the graph of the function relating each element in the domain of the quantifier to an element in the domain of the *wh*-phrase, (61) is a contradiction. If John has exhaustive knowledge of the graph of the relevant function, there is not room for not knowing a particular pairing. In (62), however, John only needs to know that the bellboys were the people who took the guests to their rooms. Since exhaustiveness is not required in this case, there is room for missing how a pairing, or all the pairings, between elements in the two terms is done. This is why (62) is not a contradiction.

What the evidence in (58)-(62) shows is that PL-readings of questions with quantifiers of the form *every*-NP, and cumulative readings arising out of plurality have different properties with respect to exhaustiveness. This situation can be explained if these readings are, indeed, two different semantic entities, but does not make any sense if the readings are one and the same as one would expect if we extend the plurality account to cover examples like (58)-(62).

2.4.4. Singular or Plural Entities: What does a Plural *Wh*-phrase Quantify Over?

The plurality hypothesis faces yet another problem, concerning the fact that the nature of the pairs in a PL-answer is different when the question word is singular than when the question word is plural. Consider the following contrasts. I use *which*-phrases in this examples, since here plurality is morphologically marked by the plural morpheme.

(63) a. Which detective interviewed each suspect?
b. Detective Jones, suspect A; Detective Smith, suspect B;...
c. #Detectives Jones and Smith, suspect A; Detectives Mill and

Holmes, suspect B; ...

(64) a. Which detectives interviewed each suspect?

b. #b. Detective Jones, suspect A; Detective Smith, Suspect B; ...

c. Detectives Jones and Smith, suspect A; Detectives Mill and Holmes, suspect B; ...

The question in (63a), where the fronted *wh*-phrase is singular, can be given the PL-answer in (63b), where each pair consists of just one detective and just one suspect. That is, the intuition of native speakers is that each element in the pairs provided as an answer to (63a), must be a singular entity. If one matches each suspect with more than one detective, the sentence is not appropriate anymore as an answer to that question. By contrast, in (64a), where the *wh*-phrase is plural, the sentence cannot be given the PL-answer in (64b) where the pairs consists of singular individuals. Rather, that questions requires that each, or (at least) some element in the set denoted by the restrictor of the quantifier be matched with groups of individuals in the set denoted by the restrictor of the *wh*-phrase.

This contrast makes sense if singular *wh*-phrases quantify over singular individuals, whereas plural *wh*-phrases quantify over whatever sort of entities plural terms quantify over (e.g., sets of individuals, plural individuals, etc.)[21]. Now, of extreme relevance to the discussion of the effect of plurality on PL-interpretations is the fact that sentences with *who/what*-phrases are truly ambiguous in that their PL-interpretation can consist of pairs matching the elements on the restriction of the quantifier to singular individuals or pluralities of individuals in the set denoted by the *wh*-restrictor. Consider again (29a), which can also be answered as in (29c), besides (29b).

(29) a. $[\text{Who}]_k$ t_k took every guest_j to his_j room last night? (PL OK)

[21] There's disagreement in the semantic literature as to what is the proper characterization of plurality. Some theories hold that pluralities are sets of individuals whereas other theories allows the notion of a plural individual consisting of parts that are themselves atomic individuals. Nothing that I will say here hinges on this debate.

b. Bell boy 1, Mr. Smith; bell boy 2, Ms. Jackson; ...

c. Bell boys 1 and 2, Mr. Smith; bell boys 3 and 4, Ms. Jackson; ...

Given the data in (63), it must be the case that the wh-phrase in (29a) is interpreted as a singular wh-phrase, when the question is answered as in (29b), and as a plural wh-quantifier when it is answered as in (29c); since, as shown in (64), question involving unambiguously plural *wh*-phrases cannot be given answers as in (29b). This conclusion is at odds with what one should expect from the plurality hypothesis, but explained if *who/what*-phrases behave like singular *which*-phrases when interpreted singularly, and like plural *which*-phrases when interpreted as plural terms. If this is so, the PL-interpretation in (29b) cannot be the result of the plurality of the *wh*-phrase. A conclusion that we have already reached before.

2.5 Interim Summary.

In have shown that the hypothesis that the PL-interpretation of questions with subject *who/what*-phrases and quantificational objects of the every-NP type is due to the plurality of the *wh*-phrases faces 4 outstanding problems. The first problem discussed in section 2.4.1., is the fact that cumulative readings require that the terms participating in the reading be plural. Sections 2.4.1.1, and 2.4.1.2. showed, respectively, that this requirement need not be met in the relevant questions in Spanish and English, and yet the family-of-question interpretation is still possible.

The second problem, discussed in section 2.4.2, concerns the fact that PL-readings of questions with quantifiers are not possible when a WI intervenes between the *wh*-phrase and the quantifier, whereas list readings arising out of cumulative readings are possible in exactly that situation. This suggests that the readings in questions are two different phenomena given that they have different syntactic distributions.

The third problems, discussed in section 2.4.3., concerns the fact that *wh*-complements exhibit different behavior with respect to the notion of exhaustiveness when they allow cumulative interpretations, as in questions with object definite plurals, than when they allow PL-interpretations, as in questions with object quantifiers of the *every*

type. This suggests that the two readings are different semantic objects and should therefore be given separate analysis.

The last problem, discussed in the preceding section, shows that when a *wh*-phrase is interpreted as a plural *wh* in a question with quantifiers, the corresponding PL-answer involves pairs matching each or, at least, some elements in the domain of the quantifier to sets or groups of individuals. This fact indicates that when PL-answers involve pairs in which no element in the domain of the quantifier is matched with sets or groups of individuals in the domain of the *wh*-phrase, as in (29b) above, the *wh*-phrase is interpreted as singular phrase.

Taken together, these problems constitute strong evidence against the plurality hypothesis and indicate, therefore, that examples like (29) show that the subject-object asymmetry is not an empirically adequate characterization of the phenomenon of *wh*-quantifier interactions in natural language. Since the putative asymmetry is a fundamental assumption of the three approaches to scope ambiguity discussed in the first three sections of this chapter, by showing that the asymmetry is wrong, I am also showing that those approaches are wrong. We need to find, then, an alternative way to explain the contrast in (5) and (6), repeated below, in which there is a lingering flavor of a subject-object asymmetry.

(5) Which gift did everyone buy for Wayne?

a. Which is the thing x, such that everyone bought x for Wayne?

b. For every person y, which is the gift x such that y bought x for Wayne?

(6) Which person brought everything for Wayne?

a. Which is the thing x, such that everyone bought x for Wayne?

b. #For every person y, which is the gift x such that y bought x for Wayne?

As we already saw at the beginning of the chapter, in (5), where the *wh*-phrase is extracted from the object position, the question is ambiguous allowing both a single answer and a family of question interpretation. In (6), however, where the *wh*-extraction

proceeds from the subject position, the question is unambiguous, allowing a single answer, but not a PL-reading as in (6b). I will suggest an explanation for this contrast in the following section.

2.6. The Subject-Object Asymmetry as a Relative Phenomenon.

In understanding the contrast in (5) and (6), one should bear in mind that *which*-phrases are atypical in not participating in scope ambiguities when occurring with universally quantifiers in object position. Indefinites and other less definite *wh*-phrases do participate in scope ambiguities from the subject position in languages like English and Spanish:

(65) Un médico diferente atiende a todo paciente de SIDA
A doctor different takes-care-of to every patient of AIDS
'A different doctor takes care of every AIDS patient'

(66) ¿Quién atiende a todo paciente de SIDA (SA, PL)
who takes-care-of to every patient of AIDS
'Who takes care of every AIDS patient'

(67) Cuál médico atiende a todo paciente de SIDA (SA, *PL)
which doctor takes-care-of to every patient of AIDS
'Which doctor takes care of every AIDS patient.'

In (65), the indefinite *un medico diferente* 'a different doctor' can take scope below the object universal quantifier *todo paciente de SIDA* 'every AIDS patient'. This is evident from the fact that *diferente* 'different' can receive a bound interpretation. That is, (65) has a reading in which per each patient there is a doctor that took care of that patient and the doctor is different from the doctor that took care of each of the other patients. (65) also allows the unbound reading of *diferente* 'different' in which the relevant doctor is compared to some other salient doctor in the utterance situation. Similarly, the

interrogative in (66) with *quien* 'who' in the subject position and the object universal *todo paciente de SIDA* is ambiguous with both a single answer and a PL-interpretation. However, (67), where the *wh*-word is the D-linked *cuál medico* 'which doctor' is not ambiguous, allowing only a single answer.

Following Heim (1987), I will argue that the (in)definiteness of the *wh*-phrase is the property that seems to distinguish *which*-phrases from other indefinite and *wh*-phrases in their ability to trigger ambiguity from the subject position when occurring with a universal quantifier in object position. What must be observed here is that the *wh*-phrases that support PL-interpretations from the subject position of a sentence with universals in object position, correlate with those that occur in there existential contexts. Consider the following.

(68) a. How much coffee is there in the kitchen cabinet?
b. How much coffee will keep every student awake? (√PL)
c. 2 cups, Meltem; 3 cups, Jay; and 1 cup; Bridget.

(69) a. How many students are there in the Department of Linguistics?
b. How many students took every candidate out for dinner? (√PL)
c. 2 students, Danny Fox; 4 students, Norvin Richards; ...

(70) a. What is there in the fridge?
b. What brought every syntactician to Cambridge? (√PL)
c. The BU conference, L. Rizzi; The Harvard conference, R. Kayne; ...

(71) a. *Whose dog is there in the yard?
b. Whose dog bit every boy in your class? (SA, *PL)
c. Bill's dog did/ *Bill's dog bit Bobby, Susan's dog, Jack;...

The previous examples show that the less definite *wh*-phrases like *how many*, *how much*, and *what*-phrases, in (68)-(70), can occur in the there existential construction and can

support PL-interpretations when co-occurring with object universal quantifiers of the *every* type. Those *wh*-phrases that are ungrammatical in there insertion contexts, like the more definite *which*-phrases or the *whose*-phrase in (71), do not support PL-interpretations from the subject position of questions with object *every*-phrases. At this point it is important to ask ourselves where *who*-phrases fit in the (in)definiteness scale as determined by there-insertion contexts. It seems that *who*-phrases fit in somewhere in the middle. Some speakers find that *who*-phrases in there sentences are not as good as *what*- or *how many*-phrases, but that they are better than *which* or *whose*-phrases. Thus Heim (1987) discusses the example below which she attributes to Safir (1982), and which is judged to slightly marginal:

(72) ?Who was there in the room when you got home?

This in itself is not a bad situation given that native speakers' judgments also vary considerably with respect to whether sentences with a subject *who* allow PL-readings. Most speakers seem to get the relevant reading in sentences like (29), repeated below, but many other speakers seem to have a hard time getting the relevant reading in very similar sentences. The judgments reported in May (1985), for instance, belong with the second group. Most of his examples illustrating the subject-object asymmetry actually contained a *who*-phrase in subject position (e.g., *Who bought everything for Max*, *Who saw everyone*...).[22] were systematically judged to be unambiguous). This may be related to the fact that *who* is not neatly categorized as a definite or an indefinite as the marginal status

[22] Notice that between May's *Who bought everything for Max?* and Chierchia's *Who put everything on the platter?* there is not real structural difference, and yet Chierchia's informants found the latter question ambiguous, whereas May's example has been repeatedly reported in the literature as unambiguous. Sloan (1991) even reports some examples respecting the subject-object asymmetry, but where the *wh*-phrase is a who-phrase, as unambiguous. Consider her examples in (ii) below.

(ii) a. Who$_i$ does everyone think you saw t_i?
b. Who$_i$ does everyone think t_i saw you?

My informants find that Sloan's example are actually ambiguous, although the PL-interpretation is more readily available if the quantifier used is of the form *every*-NP, as in (29).

of (72) suggests, and so different speakers might place it in different sides of the (in)definiteness scale. That is, speakers might cross-categorize *who*.

(29) a. $[\text{Who}]_k$ t_k took every guest$_j$ to his$_j$ room last night? (PL OK)
b. Bell boy 1, Mr. Smith; bell boy 2, Ms. Jackson; ...
c. Bell boys 1 and 2, Mr. Smith; bell boys 3 and 4, Ms. Jackson; ...

The grammar of Spanish also seems to cross-categorize *quien* 'who'. *Quien* is better in existential constructions than English *who* is. Questions like (73), are perfectly fine, for me, specially if they are followed by for-phrases like 'para bailar' 'for dancing'.

(73) Quien habia en la fiesta para bailar
who have-pt. in the party to dance
'Who was there at the party to dance?'

Thus, there insertion contexts classify *quien* 'who' as indefinite in Spanish. However, when *quien* is extracted from the object position it requires the element *a* 'to', which is usually required by elements that are very definite like proper names and pronouns. the a data then categorizes *quien* as a definite. Spanish *quien* is also responsible for variations in judgments among native speakers.

With the qualification pertaining to *who*-phrases already in place, we can now say that given the contrast between (71), on the one hand, and (68)-(70), on the other, the generalization seems to be that the more definite or *presuppositional wh*-phrases, fail, for some reason, to take scope below an object quantifier of the *every*-type. The famous subject-object asymmetry is thus a relative phenomenon. It does not characterizes *wh*-quantifier interactions across the board, but only in those cases involving presuppositional or definite interrogative determiners.

The mistake of the approaches discussed in sections 1.1 to 1.4, was to assume that the subject-object asymmetry was an across the board phenomenon, rather than a relative

one as we saw in this section. In the next section, I will start developing an analysis that will take the relative nature of the subject-object asymmetry into account.

2.6.1 A Preliminary Proposal.

As I already mention in section ??, in this thesis I will defend the hypothesis that PL-interpretations in questions with quantifiers arise when the *wh*-phrase can be reconstructed below the quantifier in the sentence. In a reconstruction view of scope ambiguity in *wh*-quantifier interactions, one way to capture the fact, noticed in the previous section, that the participation in scope ambiguity of a *wh*-phrase correlates with its (in)definiteness, is by assuming two things: 1) that some mechanism or another prevents a subject presuppositional *wh*-phrase from being reconstructed into the VP-internal position, and 2) that *every* does not move invisibly to a position higher than the derived subject position. We already saw motivation for this last assumption in section 2.4.2, when we discussed (53).

(53) a. Someone did not meet every candidate ($\exists > \neg > \forall$; $*\forall > \exists > \neg$)

b. Someone did not meet each candidate ($\exists > \neg > \forall$; $\forall > \exists > \neg$)

With respect to the first assumption, I suggest that reconstruction is constrained by the restriction in (72).

(72) **Do not reconstruct a presuppositional phrase into a theta position.**[23]

If reconstruction is constrained by the restriction in (72), it will follow that presuppotional *wh*-phrases will exhibit a subject-object asymmetry in questions with the quantifier *every* in object position. The reason is that *every* will not take scope over the

[23] This restriction can be seen as a consequence of some version of Diesing's (1992) mapping hypothesis. Diesing hypothesizes that presuppositional NPs must occur outside of the domain of existential closure at LF. She takes the domain of existential closure to be the VP. The restriction in (72) does not force anything to move out of the VP, and so it should be taken to be a restriction operating at the LF interface.

subject position, and the *wh*-phrase will not be reconstructed to the VP-internal position, given the presupposition of the *wh*-phrase. As a result, the *wh*-phrase will not be reconstructed below the quantifier and the resulting sentence is predicted not to have a family-of-question interpretation in the reconstruction approach. I will pursue the reconstruction view, assuming that the restriction in (72), or some equivalent version, in fact constrains reconstruction. The reconstruction view of scope ambiguity in *wh*-quantifier interactions will be developed in details in Chapter 2. I proceed now to summarize and conclude the current chapter.

2.7. Summary and Conclusion.

In this Chapter, we examined three approaches to wh-quantifier interactions. Those of May (1985, 1988), Aoun and Li (1993), and Chierchia (1991, 1993). The first two approaches assume that wh-quantifier interaction is characterized by the combined work of scope principles operating at the LF interface and some other restriction preventing quantifiers from crossing over wh-traces (i.e, the PCC, and the MBR). The third approach assume that scope ambiguity in questions with quantifiers is constrained by the grammar of weak cross over (WCO).

In section 1.3., we considered evidence concerning binding condition C which shows that when the *wh*-operator cannot reconstruct below the quantifier in the sentence, the question is not ambiguous lacking a PL-interpretation. We saw that neither scope principles nor an explanation in terms of WCO can account for the reconstruction facts since reconstruction is not contingent on whether the operators that interact scopally are in a nested dependency, as in scope-principles-based theories, or on whether the trace of wh-movement is in a WCO configuration with the interacting quantifier, as in the WCO approach. In addition, we saw that it is a fundamental assumption of these three approaches that scope ambiguities in wh-quantifier interactions are subject to a subject-object asymmetry.

In the different subsections of section 2., we saw that there are counterexamples to the putative asymmetry involving both the quantifier *each* and the quantifier *every* in

English. Counterexamples with *each* have been attributed to idiosyncratic properties of that quantifier, whereas counterexamples with *every* has been dismissed by the plurality hypothesis. That is, by the hypothesis that in questions involving *who/what*-phrases and an object universal of the *every* type, the PL-interpretation is related to cumulative readings given the plurality of the *wh*-phrase.

In section 2.4, I discussed 5 problems that the plurality hypothesis faces, and concluded that the subject-object asymmetry is a relative phenomenon obtaining with some determiners (the presuppositional *wh*-phrases), but not with others (e.g., the less definite ones). The proper treatment of scope ambiguity in questions with quantifiers has, therefore, to accomplish at least the following two objectives: 1) to explain the role of reconstruction in determining scope ambiguity in *wh*-quantifier interactions, and 2) characterize *wh*-quantifier interactions in terms of the subject-object asymmetry as a relative phenomenon relevant only for presuppositional *wh*-phrases like *which/whose*-phrases. I will try to achieve these two objectives in the reconstruction view of *wh*-quantifier interaction that I will develop in the following chapter.

CHAPTER II: A RECONSTRUCTION VIEW OF SCOPE AMBIGUITY IN QUESTIONS WITH QUANTIFIERS.

0. Introduction.

In chapter 1, it was concluded that the proper treatment of wh-quantifier interactions should explain the role of reconstruction in determining scope ambiguities in the relevant sentences, and characterize the distribution of such ambiguities in terms of the subject-object asymmetry construed as a relative phenomenon. In this chapter, I will argue that syntactic reconstruction of the *wh*-phrase below the quantifier is the source of scope ambiguities in questions with quantifiers. In particular, I will argue that in a question with a universal quantifier, the PL-interpretation arises when the *wh*-phrase can be reconstructed to some position below the quantifier. It will be suggested that reconstruction to a theta position is constrained by the presuppositionality of the operator extracted as suggested at the end of chapter 1. The chapter is divided in two main sections of parts. The various subsections of part 1 provide syntactic evidence based on the interaction of PL-interpretations with biding condition A (BT(A)), section 1.1, binding condition C (BT(C)), section 1.2; and various trapping contexts in raising constructions, showing that in questions with quantifiers syntactic reconstruction of the wh-phrase below the quantifier is necessary for the PL-interpretation to be available.

In the second part of the chapter, I develop a semantics for the reconstruction view of PL-readings. There I argue that once the need of syntactic reconstruction for the availability of PL-readings is recognized, the semantic representation of such readings must involve quantification over functions. I propose that syntactic reconstruction is necessary because PL-readings arise when the quantifier binds an implicit variable in a copy of the wh-phrase that is analyzed as a skolemized choice function, as in Kratzer's (1998) theory of indefinites. In the resulting theory, PL-interpretations are a subcase of variable binding. In this theory reconstruction is necessary because a quantifier can only bind a variable in its scope as mentioned in the introduction in Chapter 1.

In section 2.5.1, I will argue that in normal weak cross over WCO configurations, WCO is irrelevant (Contra Chierchia (1993)) because of considerations given in Safir (1984) regarding the binding of implicit variables. Part 2 of this chapter will also discuss the relationship between PL-readings and functional readings concluding that the two

readings should be distinguished. I will then concentrate solely on the distribution of PL-readings for the remaining of the dissertation. The general conclusion of chapter 2, is that the reconstruction approach besides been empirically superior to its competing rivals, opens up a new research agenda that was not available to its predecessors: the possibility of using PL-interpretations as a diagnostic for successive cyclicity.

1. Syntax

The first type of evidence suggesting that reconstruction is involved in the generation of PL-interpretations, in questions with quantifiers, comes from the fact that such readings correlate to some extent with binding theory (BT) reconstruction effects. The correlation between scope reconstruction (SR) and binding theory reconstruction BTR has been used, independently, by Fox (1997) and Romero (1997) to argue, convincingly, for a syntactic account of SR over a semantic account of the phenomenon. In this Chapter, I will assume that in questions with quantifiers, PL-interpretations result when the wh-phrase is syntactically, rather than semantically, reconstructed below the quantifier in the question. My assumption will be based on the fact that PL-readings correlate with BTR in the same way in which SR does. Thus, for instance, Fox (2001) remarks that under the syntactic approach to SR, one should expect the correlations in (1)

(1) A. When we see SR, there should be BTR as well
B. When we see BTR, there should be SR as well

The same correlations are expected in a theory of scope ambiguity in questions with quantifiers in which the narrow scope of the wh-phrase, i.e., the PL-interpretation, requires syntactic reconstruction. To make the expected correlation more transparent in the context of wh-quantifier interactions addressed in the present research, I will substitute pair-list (PL) for SR in (1) to yield (2).

(2) In questions with quantifiers:
A. When we see PLs, there should be BTR as well

B. When we see BTR, there should be PLs as well

Fox discusses evidence showing that (1A) holds, but (1B) doesn't. In this Chapter, I will discuss evidence of a similar sort showing, in the context of wh-quantifier interaction, that (2A) holds. Some of the evidence to be discussed below suggests that (2B) does not hold. The focus of the chapter, however, will be (2A) since this direction of the correlation will suffice to establish the necessity of syntactic reconstruction for the availability of PL-interpretations. In particular under the reconstruction view of PL-interpretation being developed here, one expect, that PL-interpretation should trigger reconstruction effects of binding condition A, i.e., BT(A), and binding condition C, i.e. BT(C), as indicated in (3)-(4).

PL-interpretations should be impossible in the following configurations

(3) $[NP_1\ [wh \ldots reflexive_1 \ldots]_2 \ldots [GC \ldots QP \ \ldots t_2 \ldots]]$

(4) $[[WH \ldots r\text{-}expression_1 \ldots]_2 \ldots [pronoun_1\ [QP \ldots t_2]]]$

In a structure like (3), the anaphor should not be reconstructed below the quantifier in the constituent that I am labeling GC, since that would place the reflexive in a position that is not local to its antecedent, i.e., *NP1*. BT(A), therefore, requires that reconstruction does not take place. If the PL-interpretation is not possible when BT(A) reconstruction is not possible, and is available when BT(A) reconstruction is possible, one will have to conclude that syntactic reconstruction is, in fact, necessary for the availability of PL-readings.

The same is true for configuration (4). In this configuration, BT(C) requires that reconstruction of the wh-phrase below the position of the pronoun does not take place. If PL-interpretations require reconstruction of the wh-phrase below the position of QP, which is below the pronoun, and given that BT(C) prevents reconstruction from taking place, the reconstruction view predicts that sentences associated with the configuration in (4) should not allow a PL-interpretation. Again, if these expectations and predictions turn

out to be true, we will have established the necessity of syntactic reconstruction for the availability of PL-readings in questions with quantifiers. I will show that the prediction of the reconstruction view of scope ambiguity in questions with quantifiers are in fact borne out. I will begin by discussing data involving the interaction of BT(A) reconstruction effects with the distribution of PL-interpretation in questions with quantifiers in Spanish.

1.1. BT(A) Reconstruction and PL-interpretations.

In this subsection, I will discuss Spanish examples involving reflexives pronouns like *si mimo/si misma* 'himself'/'herself' rather than the English equivalent. The reason for this, is that an English reflexive pronoun like *himself* translates to two different pronouns in Spanish: *si mimo/él mismo*. There is a clear difference between *si mismo* and *él mismo*, however, the former pronoun can never occur locally free and cannot have a logophoric interpretation, whereas the latter has to be locally free and can naturally allow for logophoric interpretations. It seems to me then that English reflexive pronouns are not the best candidate for evaluating Condition A reconstruction effects given their ambiguity. I will return to this point in Chapter (?). Consider now the following Spanish examples.

(5) [Que foto de si mismo]$_k$ dijo Maria que cada niño miró t_k? (*SA, PL)[1]
[which picture of himself]$_k$ said M. that each boy looked at t_k?
'Which picture of himself did M. say that each boy looked at?'

(6) [Que foto de si mismo]$_k$ dijo cada niño que Maria miró t_k? (*SA, PL)
[which picture of himself]$_k$ said each boy that M. looked at t_k?
'Which picture of himself did each boy say that M. looked at?'

(7) [Que foto de si misma]$_k$ dijo María que cada niño miró t_k? (SA,*PL)

[1] The single answer (SA) is missing (5)-(6) because the reflexive is bound by a universal quntifier which is incompatible with the wide scope interpretation of the wh-phrase which is taken to be the representation corresponding to SAs.

which picture of herself said M. that each boy looked at__?
'Which picture of herself did M. say that each boy looked at?'

(8) Que foto de si misma dijo cada niño que María miró (SA, PL)

In (5), the reflexive pronoun *si mismo* 'himself' is contained in the fronted *wh*-phrase. The only possible antecedent for the reflexive in that sentence is the quantifier phrase *cada niño* 'every boy' in the subject position of the embedded clause. Such cases have traditionally been analyzed as involving reconstruction of at least the restrictive material of the *wh*-phrase below the embedded antecedent at the level of LF (see for instance Barss, 1986). The example in (6) shows that reconstruction is possible in intermediate positions. In that example the antecedent is the quantificational subject of the matrix clause and the anaphor is contained within the extracteé in the matrix COMP. Unless the *wh*-phrase is reconstructed below the subject position in the matrix clause, but above the embedded subject position, the anaphor is not going to find a local binder as required by BT(A)[2]. The fact that both (5) and (6) do allow a PL-interpretation provides initial substance to the claim that PL-readings involves reconstruction. In both examples BT(A) requires reconstruction below the quantifier, which is the antecedent of the anaphor, and in both examples the PL-interpretation is available.

This hardly shows, however, that PL-readings and BT(A) are correlated in some sense or another. Examples like (7) are more interesting showing that the correlation is strong. In this example, the only possible antecedent for the anaphor in the sentence is the subject of the matrix clause *María* which agrees in gender with the pronoun. Since Spanish reflexives like *si mismo/si misma* 'himself'/'herself' need to be locally bound, BT(A) prevents reconstruction into the embedded CP since otherwise the antecedent *Maria* will not be local to the reflexive. The *wh*-phrase must then be reconstructed to an

[2] If one assumes that wh-movement is successive cyclic where a cycle is a strong phase in the sense of Chomsky (2001a, 2001b), there will be two positions where the wh-phrase can be reconstructed without getting into the c-command domain of the embedded subject in sentences like (6): the matrix vP and the embedded CP. I will assume that if locality can be achieved then it must be achieved. The matrix vP is therefore the best candidate for recosntructing the wh-phrase in (6). I will discuss evidence supporting the hypothesis that successive cyclic movement proceeds from vPs to CPs in Chapter 3.

intermediate position below the matrix subject, but above the embedded clause. I will assume that such a position is the outer Spec of what Chomsky (1998, 2000, 2001) calls the outer Spec of the vP phase. Notice that after reconstruction to an intermediate position occurs in (7), we have exactly the configuration (4), where PL-interpretations should be impossible. (7), in fact lacks a PL-reading. These results indicate that reconstruction of the *wh*-phrase below the quantifier, in the context of *wh*-quantifier interactions, is in fact necessary for PL-readings to be available. This is a preliminary conclusion that I will draw from the preceding contrast.

The correlation between PL-readings and BTR effects can also be illustrated by using how many phrases. It is well known that how-many phrases allow for a presuppositional or referential (wide scope) reading and a non-presuppositional (narrow scope) interpretation. This can be shown with the following example:

(9) a. How many friends do you need to win the race?
b. For what n, there are n-many friends x, such that you need x to win the race
c. For what n, you need n-many friends to win the race

The sentence in (9a) can be interpreted as in either (9b), or (9c). In the former case, n-many-NP has wide scope with respect to the intentional predicate need. In the reading in (9c), the *n many*-NP is in a reconstructed position inside the domain of *need*. There are two types of syntactic environments in which the reconstructed reading of the how many phrase seems obligatory. The first environment has been discussed in Heim (1987) and concerns there constructions as in (10).

(10) How many stories about $John_1$ does $he_{2/*1}$ think there are in the library

The sentence in (10) is fine if the pronoun is interpreted deictically, but not if it is co-indexed with the r-expression *John* in the restriction of the *how many* phrase. The explanation for contrasts like this involves the assumption of obligatory reconstruction of the *wh*-phrase, in Heim (1987), to void the definiteness effect created by referential entities in general including individual variables.

The second context in which the reconstructed reading of *how many*-phrases seems obligatory has been provided by Heycock (1995). She shows that when a *how many*-phrase is extracted from the complement position of a creation verb like *invent* or *come up with*, the reconstructed reading of the how many phrase is the only available reading since the wide scope interpretation is incompatible with the semantics of the lexical semantic of the predicate. Compare the following examples:

(11) a. *How many stories about Diana$_1$ is she$_1$ likely to invent__?

b. How many stories about Diana$_1$ was she$_1$ really upset by__?

(Heycock 1995, p.560)

In (11), BT(C) prevents the *n many*-NP part of the *how many* phrase from being reconstructed in the embedded infinitival clause since that would bring the r-expression *Diana* within the c-command domain of the pronoun. The sentence therefore can only have the wide scope reading paraphrased in (12), a reading that is incompatible with the meaning of invent since it entails that the stories exist prior to their invention. Notice that (11b) is fine since stories do exist prior to upsetting anyone.

(12) For what n, there are n-stories x about Diana$_1$, such that she$_1$ is likely to invent x.

Let us conclude then, that creation verbs like *invent* and *come up with* require obligatory reconstruction of an extracted complement *how many* phrase. Now one can use Heim's and Heycock's paradigms to further investigate the correlation between PL-readings and BTR effects in English. Consider the following examples.

(13) a. I asked John$_1$ how many stories about himself$_{*1/2}$ every boy$_2$ is likely to invent__

b. I asked John$_1$ how many books about himself$_{*1/2}$ every boy$_2$ thinks there are__ in the library.

In (13), reconstruction of the *how many* phrase to the position indicated by underscoring is needed, respectively, to satisfy the lexical meaning of *invent* and to void the definiteness effect. In that position, however, the closer antecedent for the reflexive pronoun *himself* is the quantifier phrase *every boy*. BT(A) then requires the reflexive pronoun to be bound by the quantifier. Both the examples in (13) allow for a PL interpretation. However, under any reading of (13), the PL-interpretation included, the quantifier is the antecedent of the reflexive. This result contrasts with the facts in (14), where either the proper name *John* or the quantifier *every boy* can serve as the antecedent of the reflexive.

(14) a. I asked John$_1$ how many stories about him$_{1/2}$ every boy$_2$ is likely to invent__

b. I asked John$_1$ how many books about him$_{1/2}$ every boy$_2$ thinks there are__ in the library.

Reconstruction to the underscored position in (14) is required just as in (13). Here, however, we are dealing with a non-reflexive pronoun which can be long-distance bound. Thus in (14) the sentence allow for PL-interpretation in which the antecedent for the pronoun can be either *John* or *every boy*. So (13)-(14) constitute a context in which the combination of the semantic of the main predicate and the definiteness effect, respectively, trigger both BT(A) reconstruction effects and PL-interpretations. Consider now the following.

(15) I asked John how many stories about himself every girl is likely to re-invent.

My informants find that (15) lacks the PL-interpretation. Here reconstruction is not required by the lexical semantics of the predicate since stories can, in fact, have to exist prior to their being re-invented. BT(A), however, requires that reconstruction does not take place since otherwise the quantifier *every girl* will create an opaque context for the binding of the anaphor by *John*, that is, the reflexive will have to be non-locally bound. The quantifier itself cannot be the antecedent of the reflexive because it does not match in gender with the reflexive. Perhaps the point made by the English (15), should be made by the equivalent (16) in Spanish, instead, since in this language reflexives never

allow for a long-distance bound or logophoric interpretation as I already mentioned above.

(16) pregunte a Juán cuantas historias sobre si mismo es probable que cada chica
I asked to Juan how-many stories about himself it is probable that every girl
re-invente__. (SA, *PL)
re-invent
'I asked Juan how many stories about himself every girl is likely to re-invent.'

As in (15), BT(A) prevents reconstruction in (16) to a position inside the embedded clause as that will require non-local binding of the reflexive *si mismo* 'himself'. The quantifier *cada chica* 'every girl' cannot be an antecedent for the reflexive because there is a gender mismatch: the reflexive is marked for masculine; the quantifier, for feminine. Notice that if we modify the reflexive in (16) so that it agrees in gender with the quantifier in the embedded clause, as in (17), the PL-interpretation becomes once again possible since reconstruction to the embedded clause will still satisfy BT(A):

(17) Pregunte a Juán cuantas historias sobre si misma es probable que cada chica
I asked to Juan how-many stories about herself it is probable that every girl
re-invente. (PL)
re-invent
'I told Juán how many stories about herself every girl is likely to re-invent.'

(17) contrasts sharply with (16). In the latter sentence, the PL-interpretation is very prominent. Notice now that (15)-(16) instantiate the structure in (3a); the structure where we expect that PL-readings should not be possible under a theory that argue for a reconstruction view of scope ambiguity in *wh*-quantifier interactions. Examples like the Spanish (5)-(8), (16), on the one hand, and (possibly) the English (14)-(15), other, show that PL-interpretations trigger BT(A) reconstruction effects, which is expected only if reconstruction is necessary for PL-interpretations.

Before closing this section, I want to return to discuss examples like (5)-(8), repeated below, in more detail.

(5) [Que foto de si mismo]$_k$ dijo Maria que cada niño miró t_k? (*SA, PL)
[which picture of himself]$_k$ said M. that each boy looked at t_k?
'Which picture of himself did M. say that each boy looked at?'

(6) [Que foto de si mismo]$_k$ dijo cada niño que Maria miró t_k? (*SA, PL)
[which picture of himself]$_k$ said each boy that M. looked at t_k?
'Which picture of himself did each boy say that M. looked at?'

(7) [Que foto de si misma]$_k$ dijo María que cada niño miró t_k? (SA,*PL)
which picture of herself said M. that each boy looked at__?
'Which picture of herself did M. say that each boy looked at?'

(8) Que foto de si misma dijo cada niño que Maria miro (SA, PL)

In these examples one may be tempted to entertain the hypothesis that the PL-interpretation of the questions is the result of long-ditance QR of the embedded quantifier over the wh-phrase in the matrix clause. There are two reasons, however, why such a hypothesis is incorrect. The first reason concerns the fact that a universal quantifier in an embedded clause cannot take scope over an existential in matrix subject position, as we saw in chapter 1, section 1.1, when we considered the following examples.

(18) a. Some candidate said that every dancer danced with Mary.
b. Which candidate said that every dancer danced with Mary?

Recall that since (18a) does not have a reading in which for every professor there's some student or other who thinks that the professor is smart, and since the PL-readings is missing in the question in (18b), one should join the growing consensus in the literature that the scope of a quantifier is restricted to the minimal clause that contains it

at the time the sentence is spelled out. The second reason why one should not entertain the long-QR hypothesis of the ambiguity of, say, (5), is the fact that we will be over-generating readings not only for examples like (18), but for sentences like (7), in which BT(A) prevents reconstruction from applying. Since QR in general is not contingent on the impossibility of BT(A) reconstruction, long-distance QR of the embedded quantifier in (7) predicts the sentence to have a PL-interpretation regarding of the binding possibilities of the reflexive.

In short, a long-distance QR approach to scope ambiguities in sentences like those in (5)-(8) predicts that there should be no correlation between BTR effects and scope ambiguities in *wh*-quantifier interactions. Since we have seen that PL-interpretations do correlate with BTR effects, I conclude that a long-distance QR approach to *wh*-quantifier interactions in sentences (5)-(8) would yield the wrong results.

One other point that should be noticed in connection with examples like those in (5)-(8), is that, as we already saw in chapter 1 while discussing similar cases, these examples show clearly that configurations in which the quantifier already c-commands the extraction site at spell-out are not sufficient for the question to be ambiguous: all those examples constitute cases of the relevant structural configuration (i.e., nesting), but (7), where reconstruction is blocked, does not allow for the relevant interpretation.

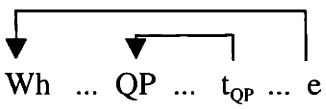
To summarize, in this section I have shown that in structures in which a universal quantifier already c-commands the extraction site of a question word by spell-out, the corresponding interrogative sentence allows for a PL-interpretation if one enforces BT(A) type reconstruction effects to a position below the quantifier in the sentence. When reconstruction below the quantifier is required, as in (5)-(6), the PL-reading is available. Examples like (7), where reconstruction below the quantifier is prevented by BT(A) seem to indicate two things: 1) that reconstruction is in fact necessary for the availability of PL-interpretations; and 2), that configurations in which the chain of the quantifier is nested within the wh-chain are not sufficient for questions with quantifiers to be ambiguous. If that were the case, all the examples in (5)-(8), which are associated with nesting structures at LF, should be ambiguous. In the next section I will consider evidence involving the interaction of BT(C) with the distribution of PL-interpretations

intended to demonstrate once again the need of syntactic reconstruction for the availability of such readings.

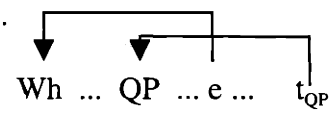
1.2. Trapping the Culprit: The Need of Syntactic Reconstruction in PL-interpretations.

Recall that the previous approaches to wh-quantifier interactions discussed in Chapter 1 assume that scope ambiguities in such contexts are subject to a nesting-crossing asymmetry known as the subject-object asymmetry. The relevant asymmetry can be schematized as in (19).

(19) a. (ambiguous)



b. (unambiguous)



In Chapter 1, I showed that the subject-object (i.e., nesting-crossing) asymmetry is a relative phenomenon that applies only to some wh-phrases and quantifiers. In this section, I will present new evidence, albeit of a different nature, against approaches that analyze scope ambiguity in wh-quantifier interactions in terms of the putative asymmetry. In particular, I will take the syntactic configuration in which everyone agrees that PL-readings are possible, namely (19a), as a point of departure. I will then do two things: 1), confirm that the relevant structure is not sufficient for the availability of PL-interpretations, as already concluded in the previous section; and 2) show that reconstruction of the wh-phrase below the quantifier is indeed necessary for the availability of the relevant reading.

To achieve these two objectives, I will consider examples in Spanish and English instantiating the structure in (19a), where e is a gap of extraction. I will show that when the wh-phrase is "trapped" in the [Spec CP] position, i.e. when the configuration in (4)

obtains, the PL-reading is not available. Consider the following examples repeated from Chapter 1, section 1.3.

(20)

a. [A cual jugador de su equipo$_k$]$_j$ piensa PR$_k$ que cada fanático acoso t$_j$? (SA, PL)
to which player in his team think PR$_j$ that every fan harassed

'[which player in his$_k$ team]$_j$ does P.R$_k$ think that every/each fan harrased t$_j$'

b. El piensa que el f. alto acosó a Morning; el bajo, a Hardaway; ...

he thinks that the tall fan harassed Morning; the short one, Hardaway; ...

(21)

[A cual jugador del equipo de PR$_k$]$_j$ piensa él$_k$ que cada fanatico acosó t$_j$?
to which player in the team of PR thinks he that every/each fan harassed t$_j$

'[which player in PR$_k$'s team]$_j$ does he$_k$ think that every/each fan harassed t$_j$'

(SA, *PL)

(22)

[A cual jugador del equipo de PR$_k$]$_j$ piensa él$_i$ que cada fanatico acosó t$_j$?
to which player in the team of PR thinks he that every/each fan harassed t$_j$

'[which player in PR$_k$'s team]$_j$ does he$_i$ think that every/each fan harassed t$_j$'

(SA, PL)

The contrast in (20)-(22) clearly shows that, in questions with quantifiers, syntactic reconstructions of the *wh*-phrase below the quantifier is necessary for PL-readings to be available. In (21), for instance, which instantiates the configuration in (4), the PL reading is not available. In this particular example, the *wh*-phrase has been extracted from the c-command domain of the quantifier in the embedded clause. The *wh*-phrase contains the r-expression *Pat Riley* (PR), which is co-indexed with the pronominal subject of the matrix clause. The universal quantifier is below the position of the pronoun. This means that for the *wh*-phrase to get inside the c-command domain of the quantifier, it has to incur in a violation of BT(C). BT(C), then, prevents reconstruction from applying in (21). The fact that the list interpretation is not available in that example confirms that in *wh*-quantifier interaction, syntactic reconstruction of the *wh*-phrase below the quantifier is necessary for

the sentence to be ambiguous allowing a PL-interpretation. This is specially evident when one contrasts (21) with examples like (20), or (22), which can be given the PL-answer in (20b). (20) has the opposite binding configuration of (21). In that example, the pronoun is in the restriction of the *wh*-phrase whereas the r-expression is the matrix subject. A PL-answer is possible because nothing prevents the *wh*-phrase from being reconstructed below the quantifier. Similarly, in (22), nothing prevents reconstruction either since the r-expression, although in the restriction of the *wh*-phrase, is not co-index with the pronoun in the matrix subject position. The reconstruction view, then, correctly predicts (22) to allow PL-answers.

Notice once again that examples like (20)-(22) show that nesting configurations, like the structure in (19a), are not sufficient for questions with quantifiers to be ambiguous. All those examples are associated with the structure (19a), but (21), however, is not ambiguous. Notice also, that (20), the example that is not ambiguous, instantiate the structure in (4), which is exactly the structure where one expects PL-readings to be missing if such interpretations trigger BT(C) reconstruction effects. That is, if syntactic reconstruction is necessary for such readings to be available. I conclude that that is in fact the case. In the following section I will present further evidence for the reconstruction approach involving more cases in which the fronted *wh*-phrase is "trapped" in the matrix clause. It will be seen that list answers are also missing in those environments.

1.3. Trapping With Raising Constructions.

In this section, I will use raising constructions in order to further provide more evidence in support of the reconstruction approach over the other competing analyses. Lebeaux (1994), argues that the possibility of inverse scope in sentences like (23) arises through reconstruction of the raised quantifier.[3]

(23) a. **Some boy or other** seems to me to have met **every/each girl** ($\exists > \forall$; $\forall > \exists$)

b. **Some boy or other** seems to my mother to have met **every/each girl**

[3] Some of the examples in this section are modeled after similar examples used in Fox (2000).

$(\exists > \forall;\ \forall > \exists)$

c. **Ten soldiers** are expected (by Napoleon) to die in **every/each battle**

$(\exists > \forall;\ \forall > \exists)$

Lebaux also shows that one can "trap" the quantifier in the Spec position of the matrix IP, by inserting an anaphor or pronoun and co-indexing it with the subject-to-subject raised quantifier. As a result of the trapping, the inverse scope construal, available in normal cases like (23), disappears. Consider the examples in (24), which are only minimally different from those (23).

(24) a. **[Some boy or other]**$_k$ seems to himself$_k$ to have met **every/each girl**

$(\exists > \forall;\ *\forall > \exists)$

b. **[Some boy or other]**$_k$ seems to his$_k$ mother to have met **every/each girl**

$(\exists > \forall;\ *\forall > \exists)$

c. **#Ten soldiers** are expected by their commander to die in **every battle/ each battle**

$(\exists > \forall;\ *\forall > \exists)$

Unlike the sentences in (23), the examples in (24) lack the construal in which the universal quantifier takes scope above the existential quantifier. The only available reading for these examples is the one in which the existential quantifier in the subject position of the matrix clause takes scope over the universal quantifier in the embedded clause. The situation can be appreciated more clearly when one considers examples like (24c). Given the meaning of the predicate *die*, the reading in which the existential takes scope over the universal quantifier is a pragmatically odd reading since it will entail that particular individuals are expected to die in more than one battle. Such a reading only makes sense in what I call an X-Files interpretation in which re-incarnation is a possibility. The oddness of (15c), is thus due to the fact that this sentence only allows for the X-files interpretation which is in conflict with the meaning of *die*: *die* seems to denote a one time event.

Here, I will make use of, basically, the same experiment, but in the context of *wh*-quantifier interactions. I notice that questions with quantifiers involving raising

constructions behave like their non-raising counterparts with respect to the distribution of scope ambiguities. Thus, the mono-clausal questions in (25) allow PL-answers, and so do their raising counterparts in (26). The '#' sign indicates that a given interpretation is pragmatically odd

(25) a. **Which boy** resembles **every man in your class**? (#SA, *PL)
b. **Which boy** resembles **each man in your class**? (#SA, PL)
c. **How many soldiers** will die in **every battle**? (#SA, PL)

(26) a. **Which boy** strikes you as resembling **every man in your class**? (#SA, *PL)
b. **Which boy** strikes you as resembling **each man in your class**? (#SA, PL)
c. **How many soldiers** seems to (Napoleon) to be likely to die in **every battle**? (#SA, PL)
d. **How many soldiers** are expected by Napoleon to die in **every battle**? (#SA, PL)

My informants find that the single clause question in (25a) and its raising counterpart in (26a) only allow for the "*X-files interpretation*", i.e. the interpretation in which the person who asks the question is seeking information as to the identity of the individual that has the "paranormal" property of resembling every man. This is the reading that corresponds to the single answer (SA). Similarly, the mono-clausal questions in (25b-c) and their raising versions in (26b-d), are ambiguous, allowing both SAs and PL-answers.
The sample questions in (25)-(26) also show that the quantifiers *every*, and *each* have a different behavior. When a *which*-phrase is extracted from the subject position and the quantifier *every* is in object position, the question does not have a PL-interpretation. The correspondent counterpart with *each* in object position does allow a PL-interpretation.

In chapter 1, section 2.4.2, we considered some evidence suggesting that the quantifier *each* seems to raise higher in the clause that the quantifier *every*. If that is the case, the contrast will follow if the *wh*-phrase can reconstruct to a position in the c-command domain of *each* at LF, but not in the c-command of *every*. I will return to the differences between *each* and *every* in the following section. What is important for now

is that both the mono-clausal question involving *each* in (25b) and its raising counterpart in (26b) have a PL-interpretation. We can now use the raising version in order to reproduce Lebeaux's experiment. If PL-readings in the raising construction require reconstruction of the *wh*-phrase below the quantifier in the embedded clause, this reading should not be available if one traps the *wh*-phrase in the matrix CP by letting it bind an anaphor or reflexive in the matrix clause. This prediction is, in fact, borne out. Consider the following examples.

(27) #Which boy strikes himself as resembling each man? (*PL)

(28) Which dancer$_k$ seems to his$_k$ mother to have danced with each candidate ?

(SA, *PL)[4]

(29) a. **#How many soldiers** seem to themselves to be likely to die in **every battle**?

b. **#How many soldiers** seem to their relatives to be likely to die in **every battle**?

c. **#How many soldiers** are expected by their commanders to die in **every battle**?

In (27), the *wh*-phrase is trapped in the matrix COMP because if it is reconstructed in the embedded clause, the reflexive *himself*, will not find a local antecedent in the matrix

---

[4] Compare to (28) to (i) which is ambiguous.

(i) Which dancer seems to your mother to have danced with each candidate?

(SA, PL).

(17) should also be compared with (ii) where we have replaced the quantifier in object position by a *which*-phrase.

(ii) Which dancer$_k$ seems to his$_k$ mother to have danced with which candidate ?

(PL)

In this case, the sentence allows for a PL-reading in the presence of "trapping", but this is only because the object *wh*-phrase can always take scope with the matrix *wh*-phrase as is well-known since Baker (1968, 1970). So the PL-reading in multiple questions is derived by a different syntactic mechanism than the PL-interpretation in questions with quantifiers in that it does not require syntactic reconstruction of the higher *wh*-phrase. For different ways of representing PL-readings in multiple questions see for instance Baker (1970), Karttunen (1977), Reinhart (1997), among others.

clause, yielding a violation of BT(A). My informants find that the PL-interpretation is not available in that example, in sharp contrast with the question in (26b). The same facts are reproduced in (28) and (29) where the SA is the only available interpretation. This is evident fro the oddness of the questions in (29). These questions are odd because they only allow the X-files interpretation which is only pragmatically acceptable if the possibility of re-incarnation is part of the beliefs of the speakers. Reconstruction of the fronted *wh*-phrase in (28)-(29) is not possible because otherwise the anaphor or pronoun in the matrix clause would be left without a binder. In such examples we are then in a conflict between the requirements of PL-readings and binding. The former requires that reconstruction below the quantifier in the embedded sentence take place. The latter require that reconstruction does not take place. The solution to this conflict, is to leave the *wh*-phrase in the COMP position an interpret the question as a single question, in which case only the single answer is necessary.

The contrast between the ambiguous examples in (25) and (26), on the one hand, and the unambiguous ones in (27)-(29), establish the necessity of reconstruction for the availability of PL-interpretation.

To summary, we started this chapter by arguing that a reconstruction view of scope ambiguities in questions with quantifiers is associated with the two general expectations in (2) repeated below:

(2) In questions with quantifiers:

A. When we see PLs, there should be BTR as well

B. When we see BTR, there should be PLs as well

We saw that (2A) holds since PL-readings trigger BTR effects. In particular we saw in sections 1.1, and 1.2, respectively, that the predictions that PL-readings should be impossible in the configurations in (3) and (4) is in fact borne out.

PL-interpretations should be impossible in the following configurations

(3) $[NP_1$ [wh ... reflexive$_1$ ...]$_2$ ... [GC ... QP ...t_2 ...]]

(4) [[WH ... r-expression$_1$ ...]$_2$ ... [pronoun$_1$ [QP ... t_2]]]

At the same time, the truth of the prediction in (3)-(4), established in the relevant sections above, is enough to establish in turn the necessity of syntactic reconstruction for the availability of PL-readings and scope ambiguities, generally, in questions with quantifiers. A proper theory of scope ambiguity in *wh*-quantifier interactions should, therefore, account for the role of reconstruction in determining such ambiguities. As we saw in chapter 1, this point has been missed by the major approaches to *wh*-quantifier interactions discussed there.

I have not yet addressed, however, the expected correlation in (2B). I will return to the subject in section 1.5, and in chapter 3, section 1.4, below I will address the differences between the quantifiers *each* and *every* in examples like (25)-(26).

1.4. Each vs. Every.

Since Chapter 1, sections 1.4.1, and 2.1, we have seen that the quantifiers *each* and *every*, when occurring in object position, behave differently with respect to the way in which they interact with presuppositional wh-phrases (e.g., which-phrases) in subject position. Thus, the question in (25b), where *each* is the quantifier in object position, allows a PL-answer straightforwardly, but its counterpart in (25a), where *every* instead of *each* occupies the object position, lacks the relevant interpretation.

(25) a. **Which boy** resembles **every man in your class**? (#SA, *PL)
b. **Which boy** resembles **each man in your class**? (#SA, PL)

The phenomenon of wh-quantifier interaction in raising construction, studied in the previous section, can shed some light as to what the relevant difference between these two quantifiers is. Consider again (26) and (27), repeated, from the previous section.

(26) a. #**Which boy** strikes you as resembling **every man in your class**? (#SA, *PL)
b. **Which boy** strikes you as resembling **each man in your class**? (#SA, PL)

(27) #Which boy strikes himself as resembling each man? (*PL)

The example in (27), when compared with (26b), shows that the PL-readings in questions involving a subject-to-subject raised *wh*-phrase and the a universal quantifier in the embedded position arises through reconstruction of the *wh*-phrase below the quantifier. when reconstruction is blocked as in (27), the PL-reading is missing; when reconstruction is not blocked, as in (26b), the PL-answer is available.

The absence of a PL-interpretation in (26a), however, suggests that when nothing blocks reconstruction, a *which* phrase can reconstruct below the quantifier *each* in the embedded clause-- (26b) is ambiguous--, but not below the quantifier *every*, as in (26a). This state of affairs makes sense if *each* occupies a position that is higher than the position that *every* occupies at a certain level of representation, and the two positions are mediated by one of the sites used by the *which*-phrase on its way to COMP. There is, in fact, some evidence suggesting that *each*-type quantifiers do move higher in the syntax than *every* type quantifiers. The evidence concerns sentences involving multiple quantifiers mediated by negation and has been discussed in Beghelli (1995), and Beghelli and Stowell (1997), among others:

(30) a. Some professor (or other) did not recommend every student ($*\forall > \exists > \neg$)

b. Some professor (or other) did not recommend each student ($\forall > \exists > \neg$)

The sentence in (28a) does not have a reading in which the universal quantifier takes scope over the subject existential which in turn takes scope over the negation. This reading, however, is possible for the sentence in (28b). That is, (28b) allows an interpretation in which for each student there is some professor or other that did not recommend him or her. To explain this contrast one must assume that negation does not block movement of universal quantifiers generally or the contrast would not obtain in the first place. Rather, the contrast seems to show that *every* moves to a position underneath negation whereas *each* can move to a position over negation. How far over negation can

each move? Let us take into account that subject existential quantifiers of the form *some*-N, as in (28), cannot take scope under negation even in simpler sentences like (29):[5]

(31) Some student did not come

If the existential in (29) were able to scope under negation, the sentence would mean that no one came. This interpretation is not available, however. This seems to indicate that *some student* is interpreted in its surface site (i.e. the subject position) in sentences like (28)-(29) where it has overtly raised over sentential negation. The possibility of a wide scope reading for *each* with respect to *some* in (28b) suggests, thus, that *each* can be interpreted higher than the subject position in the clause whereas *every* cannot. It is important to notice at this point, that even though each can scope higher than every in a given clause, the scope of the former determiner is still clause-bound just as the scope of *every* is:

(32) a. Some student (or other) thinks that every professor at MIT is a genius (#∀>∃)
b. Some student (or other) thinks that each professor at MIT is a genius (#∀>∃)

Neither *each* in (30b), nor *every* in (30a) can take scope over the existential quantifier in the matrix clause. Given examples like this, the current assumption today, at least in the syntactic literature, is that the scope of quantifiers in general, including *each*, is clause-bound, see for instance, Hornstein (1984, 1995), Kennedy (1997) and references there in. Taking clause-boundedness into account, I suggest that the difference between *each* and *every* is due to the fact that *each* has a feature that is attracted by a *probe* in the sense of Chomsky (2000, 2001). I will assume that the relevant probe is associated with a head in the *complementizer system* in the sense of Rizzi (1999), and that *every* lacks the relevant feature. As a result of this distinction, *each*-type quantifiers will

[5] This is because some-NPs are positive polarity items (PPIs) (references). Other existential that are not PPIs can definitely reconstruct under negation. Witness the contrast in (iii).

(iii) a. An employee has not been fired (in this company) since 1979.
b. Someone has not been fired (in this company) since 1979.

be moved by operations of the computational system whereas the same will not be true for *every*. But what exactly is the relevant feature? A plausible hypothesis is that the feature in question is related to specificity. In general, *each* type quantifiers are cross-linguistically more specific than *every*-type quantifiers. For instance, the former type of quantifiers can occur in partitive phrases felicitously, but the same is not true of the latter type of universals. Thus compare the following.

(33) English.

a. Each of the students came

b. *every of the students came

c. everyone of the students came

(34) Spanish.

a. Cada uno de los estudiantes vino
each one of the students came
'Each one of the students came'

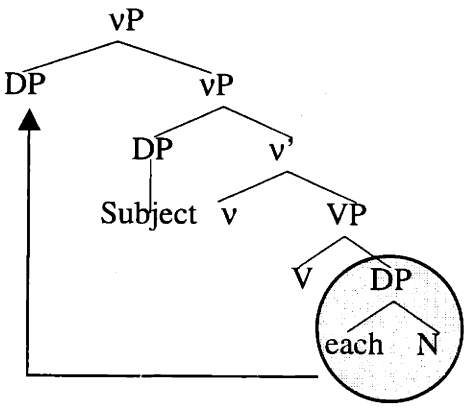
b. *Todo de los estudiantes vino
every of the students came-pl.
'Every one of the students came'

The subjects in the a-sentences in (31)-(32) are partivive DPs involving determiners of the *each*-type. The sentences are grammatical. By contrast, the b-sentences, where the partitive DPs are headed by determiners of the every type, are not acceptable. If specificity correlates with partitivity, this contrast suggests that *each*-type determiners are more specific than *every*-type ones.

The hypothesis that *each*-type quantifiers are more specific than *every*-type quantifiers also receives support from the phenomenon of clitic doubling. It has often been assumed in the linguistic literature that specificity plays some role in clitic doubling constructions; see for instance, Suñer (1988), Sportiche (1992), and Torrego (1995), among others. In languages like Modern Greek(MG), the counter part of *each* can be clitic doubled more easily than the counterpart of *every* (Sabine Iatridou p.c.).

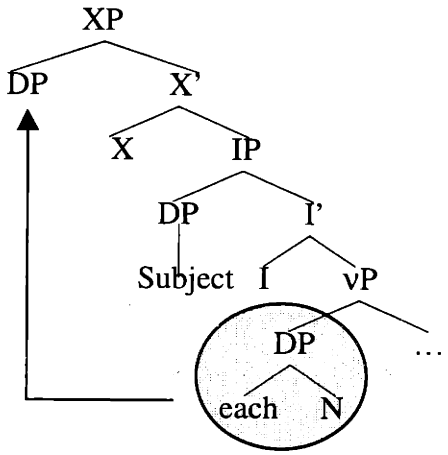
For this reason, Sabine Iatridou has suggested the possibility that perhaps *each* moves, covertly, to something like Sportiche's (1992) Clitic Phrase which he relates to both clitic doubling and specificity and is located to the left of the AgrsP. I do not have conclusive evidence revealing the exact nature of the position that *each* moves to, but given the preceding discussion, I will assume that the given phrase is in fact related to specificity, and that it is located somewhere in the complementizer domain, that is, to the left of the specifier of IP position. I assume then that *each* moves covertly as in (37)

(37) a. Cycle 1.



Covert raising of the object QP to the Edge of the phase.

b. Cycle 2

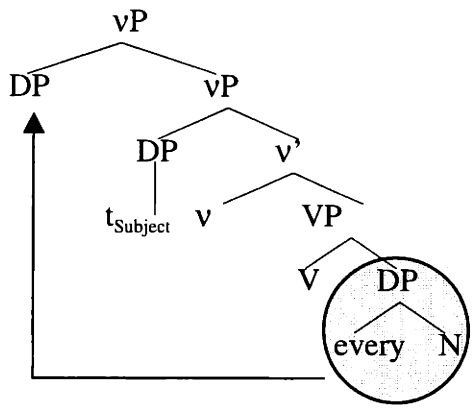


Covert raising from the edge of the vP phase to a probe in the complementizer system<FN4>

I am assuming a minimalist version of phrase structure in which movement proceeds by cycles or phases in the sense of Chomsky (2000, 2001). In (37a), the *each*-NP moves covertly to the edge of the vP cycle. From there it moves again to the specifier of a head in the complementizer domain and which I have labeled XP in (37b). The situation is different for the quantifier *every*. In this case there are no features in the complementizer domain attracting it. However, I will assume that quantifiers in the object position(s) of n-ary predicates needs to move for type theoretic reasons (cf. Heim and Kratzer 1998), to the first available site where it can be interpreted. Such a site should be the sister of a node of type t so that the quantifier can abstract properly over an individual variable in theta-position. The best candidate will be the outer Spec of the vP which will

dominate the constituent containing the trace of the subject[6]. Movement of every for type theoretic reasons is illustrated in (38).

(38). **Raising of the object QP to the edge of the vP to make interpretation possible.**



We are now in a position to explain the contrast between pairs of sentences like those in (25a, b), repeated below, once we assume that there is a condition preventing reconstruction of presuppositional operators (e.g. *which* phrases, *who*-phrases, etc.) into the vP-internal subject-position, as I suggested in Chapter 1, section 2.5.1. The derivations associated with (25a, b) are given below in (39) and (40), respectively.

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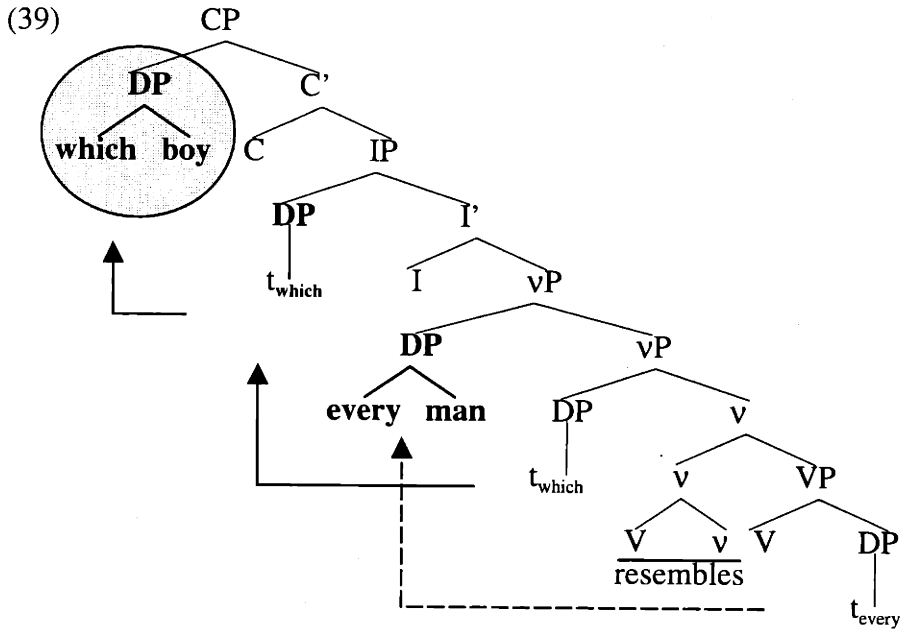
[6] There are some questions concerning the position to which *every* moves for type theoretic reasons. It is possible that besides moving for type theoretic reasons, *every* may also move for considerations having to do with richness of interpretation beyond the first available position in which it can be interpreted as argued in Fox's (2000) *scope economy* theory. In a sentence like *Mary refused to visit every city that Sue did*, the quantifier *every* can move to either of the matrix or the embedded VP given that the elided VP can take any of those VPs as antecedent. This, however, does not show that *every* always moves long-distance since it may simply be that ellipsis creates additional scope possibilities for the quantifier. Notice for instance that since the ellided VP is inside the restriction of the quantifier, one could argue for instance that the entire quantifier phrase is not interpretable in the embedded clause, if the ellided VP takes the matrix VP as an antecedent. Under that possibility movement of every to the matrix to the left of the matrix VP is still movement to the first available intepretation where it can be interpreted. Scope economy also raises questions concerning the interaction of *every* and other scope bearing elements like negation which interact with that quantifier in ways that are not always expected from the formulation of the principle in Fox (2000). I will leave these questions open for future research to settle.

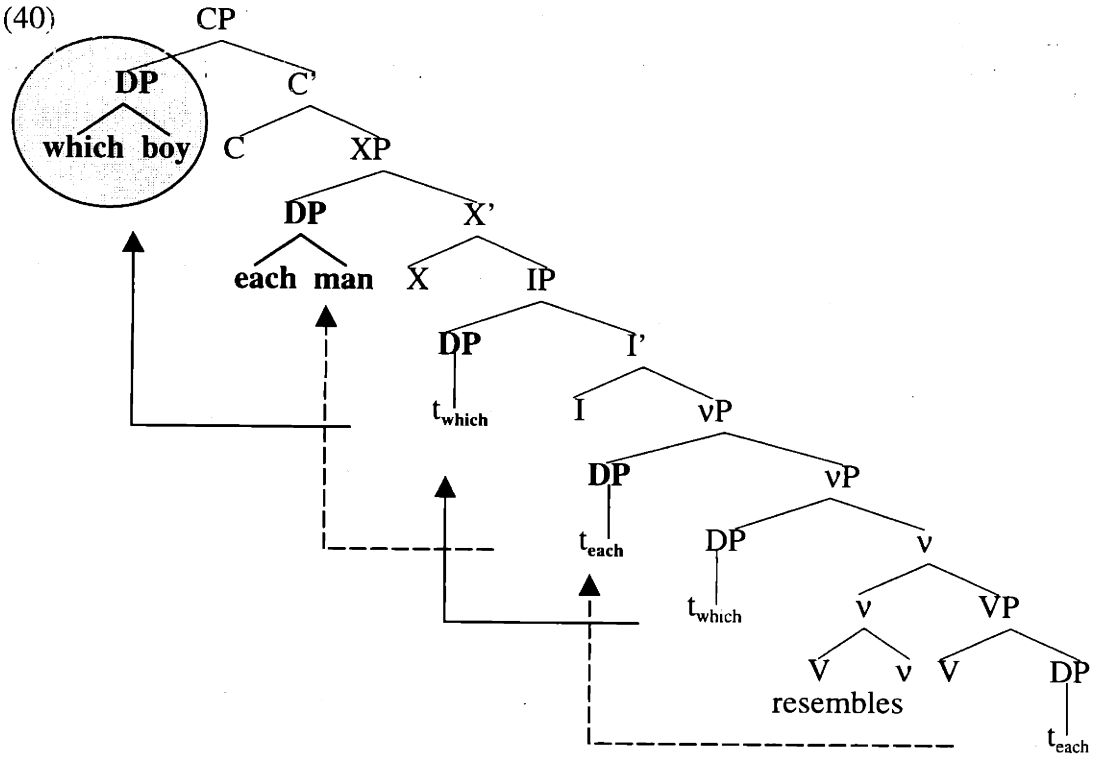
(25) a. **Which boy** resembles **every man**? (SA, #PL)

b. **Which boy** resembles **each man**? (SA, PL)

(39)



(40)



(39) differs from (40) in that the latter structure involves three positions associated with the quantifier *each* during the course of the derivation, and three positions associated with the *which*-phrase as well. By contrast, the derivation in (39) only associates two positions with the quantifier *every* in the course of the derivation. Under the assumption that reconstruction is constrained by the restriction in (41), repeated from chapter 1, the base positions are not available for reconstruction in any of these derivations.

(41) **Do not reconstruct a presuppositional phrase into a theta position.**

This leaves only two positions available for reconstruction of the *wh*-phrases in (39)-(40). Reconstruction places the subject *wh*-phrase below the c-command domain of one of the copies of the object quantifier *each* at LF in the structure in (40). However, reconstruction does not place the subject *wh*-phrase below any copy of the object quantifier *every* in (39). This is because the highest copy of *every* is in the specifier of the vP, whereas the lowest position available for reconstruction of the presuppositional *which*-phrase, given (41), is the specifier of IP[7]. Since PL-readings require interpretation of one of the copies of the *wh*-phrase below one of the copies of the quantifier, it follows that the sentence associated with (40), i.e. (25b), but not that associated with (39), i.e. (25a), will have a PL-interpretation.

1.5. Lack of Scope Reconstruction in WIs: Longobardi's Observation.

In the preceding sections we saw that the expectation in (2A), i.e. the expectation that the distributive or PL-interpretations of questions with quantifiers triggers BTR effects holds. That is, we saw that in a question with a universal quantifier, when we find the distributive interpretation of the question, we also find BTR effects with respect to the

[7] Notice that if one substitutes the more definite which-phrase in (39) by less definite wh-phrase (e.g., a *how many*-phrase) the restriction in (41) will not apply and reconstruction to the base position of the subject will be possible, predicting the sentence to be ambiguous. This is in fact the right prediction. The sentence in (iv) below is ambiguous allowing both a single answer and PL-interpretation.

(iv) **How many boys** resemble **every man**? (*SA, PL*)

syntactic domain of the quantifier. There is some evidence suggesting that the opposite expectation, i.e. (2B), does not hold. The evidence comes from the fact that, as observed by a number of researchers, e.g. Longobardi (1987), Cinque (1990), Frampton (1990, 1999), Cresti (1995); for some not very well understood reasons scope reconstruction does not take place inside a weak island. Longobardi (1987) was the first linguist to make this observation, to my knowledge. The content of his observation can be sketched as in (42).

(42) **Longobardi Observation (LO).**
In the context [Wh ... [W_I ... t_{wh}]], the wh does not take scope inside the domain of W_I. Where W_I is a weak island.

LO can be illustrated with examples like those in (43), where the *wh*-phrase is extracted, across a weak island, from the c-command domain of a universal quantifier which is in turn in the domain of the island.

(43) a. Which book do you wonder whether every student read
b. For which book x, you wonder whether every student read x
c. #For every student y, which book do you wonder whether y read

Longobardi observes that sentences like (43a) allow a single question interpretation, informally paraphrased as in (43b), but not a distributive or family-of-question interpretation, paraphrased as in (43c). The example in (43) uses a *wh*-island, but LO holds for other WIs as well. The examples below include negation, and affective predicates like *regret* and *deny*. The lexical items associated with a WI appear in bald face in the examples below.

(44) Which candidate **didn't** you know that every student voted for __? (SA, *PL)

(45) Which candidate do you **regret** that every journalist harassed with embarrassing questions? (SA, *PL).

(46) Which president did Gore **deny** that every woman he knew had an affair with__?
(SA, *PL)

None of these examples allow for an interpretation in which the universal quantifier distributes over the *wh*-operator, something that is possible in the absence of weak islands as in the many examples discussed above.[8]

Cinque (1990) observes that the absence of SR in WIs seems to show that there is a reconstruction asymmetry between SR and BTR effects since the latter type of reconstruction appears to be possible across WI contexts. He provides the following examples.

(47) a. It is to herself$_1$ that I don't know whether she$_1$ wrote__.
b. *It is to her$_1$ that I don't know whether Mary$_1$ wrote__.
c. *It is to Mary$_1$ that I don't know whether she$_1$ wrote__.

In the examples in (47) BTR into the WI seems obligatory. In (47a), for instance, the anaphor herself must occur within the c-command domain of the pronoun *she* at some level of representation if BT(A) is to be satisfied. Similarly, the ungrammaticality of (47b-c) can be attributed to BT(B), and BT(C), respectively, but only if the pronoun *her* and the r-expression *Mary* appear in the gap in the embedded clause at the relevant level of representation. Notice that the situation arising out of the combination of LO and Cinque's facts means that (2B) does not hold. That is, if Cinque's facts are right, we have discovered an environment, i.e. WIs, where we find BTR effects, but not the distributive or multiple question reading of questions with quantifiers. I have presented Cinque's facts with an *if*, because Romero (1997) has shown that clefts constructions do not separate SR from BTR since SR down weak islands is also possible in clefts. Consider her example given in (48).

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[8] Witness the distributive reading of (v).

(v) Which candidate did you say that every journalist harassed? (SA, PL)

(48) It's twelve GRAPES that I don't know whether I'll be able to chew at once (... but, ten hazelnuts, I'm sure I can.)
Reconstructed scope reading: "I don't know whether it is possible for me to chew an amount of twelve grapes at once."

Romero's example undoubtedly shows that Cinque's cleft examples do not show an asymmetry between SR and BTR. I believe, however, that the asymmetry noticed by Cinque obtains in the context of wh-extraction across WIs:

(49) Which picture of himself$_1$ does Hilary wonder whether Clinton$_1$ wants to exclude from the report?

(50) a. *Which claim that John$_1$ was asleep is he$_1$ willing to discuss with the committee?
b. *Which claim that John$_1$ was asleep isn't he$_1$ willing to discuss with the committee?
c. *Which claim that John$_1$ was asleep did he$_1$ deny that Mary had fabricated?

(51) Which claim that John$_1$ made was he$_1$ willing to discuss with the committee?

The sentence in (49) is fine. Notice that in that example, however, the antecedent of the reflexive is inside the *wh*-island. Therefore, if BT(A) is to be satisfied, reconstruction of the reflexive inside the *wh*-island must be possible. Examples like (50a) are interesting because they show that when a fronted *wh*-phrase contains an r-expression in an argument of the *wh*-restriction, co-indexation with a pronoun that c-commands the extraction site is impossible. Freidin (1986) and Lebeaux (1988, 1990, 1991) noted that examples like (50a) contrast with those in which the *wh*-phrase contains the r-expression in an adjunct, as is the case in (51), which are grammatical under the relevant co-indexation. The explanation of the contrast between (50a) and (51) proposed in Lebeaux's work and accepted in Chomsky (1995), Fox (2000), Heycock (1995), among others,

involves obligatory reconstruction of the restriction of the *wh*-phrase in the case in which the r-expression is contained in the argument, but not when it is contained in adjunct. Now, if one accepts the explanation of the contrast in terms of obligatory reconstruction, then one must expect that for the speakers for whom (50b-c) do not ameliorate, reconstruction is still obligatory into the WI in those sentences.[9] (49), then, and (possibly) the examples in (50), if Lebeaux's explanation of the argument/adjunct asymmetry is right, shows that BTR across WI is possible unlike the case of SR as we saw in (44)-(46). We have seen then, that the expectation in (2B) does not hold. That is, one can see BTR effects without SR, generally, and PL-interpretations in particular.

What is the meaning of this result? Given the fact that (2A) holds, which shows that reconstruction is necessary for PL-interpretations, I will conclude that reconstruction is necessary for the availability of PL-interpretations, but that it is not a sufficient condition. In particular, I will argue that given the way PL-interpretations are represented in the semantics, and given certain assumption about the distribution of higher-order variables in syntactic environments, such readings must occur in weak-island free environments. I will return to this point in Chapter 3, section 1.2. In the following section, I will consider very briefly a possible explanation to the reconstruction asymmetry just discussed in this section.

1.6. Reconstruction and the Copy Theory of Movement.

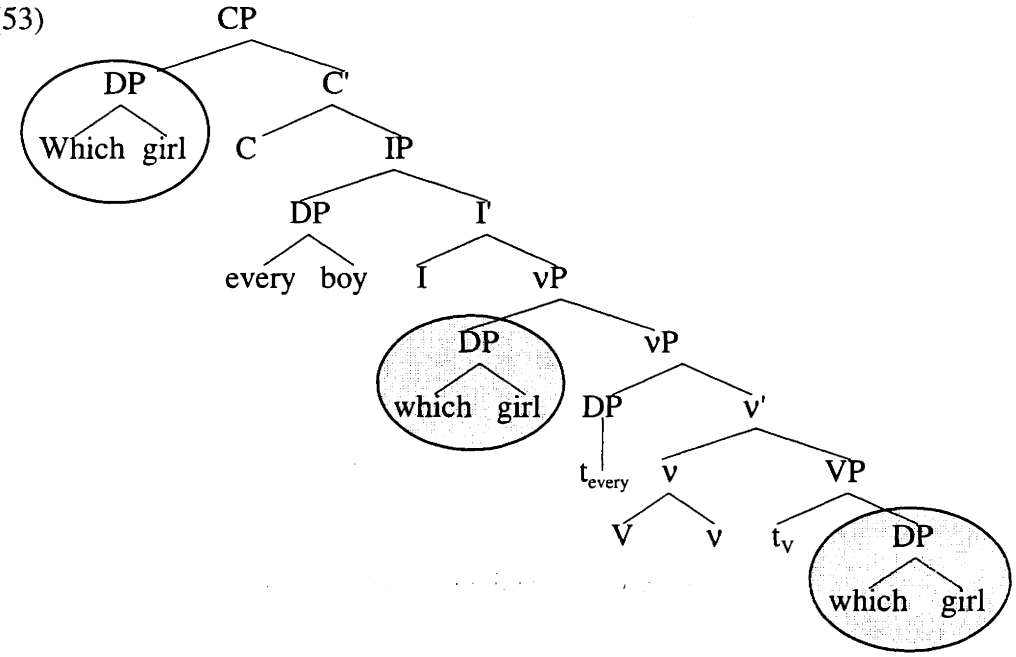
In what follows I will adopt the copy theory of movement proposed in Chomsky (1993, 1995, 1998, 2000, 2001), and adopted by a number of other researchers. In this theory, movement leaves an exact copy of the displaced linguistic item in the original site, rather

[9] I am not sure of what the judgment really is for (50b-c). For one thing, many of the speakers I consulted do not really have the argument-adjunct distinction characteristic of the Lebeaux-Freidin's facts to start with, and so I could not try to see whether the WI environments make a difference. I found just one speaker that seems to not like any of the examples in (50) suggesting that obligatory reconstruction of arguments occurs with or without WIs. In any event one speaker is not enough to draw any reliable conclusion, and I will have to leave the data in (50) as a big if: if WIs do not make a difference for speakers who require obligatory reconstruction of arguments in their grammar, then reconstruction down WI must be assumed for the Lebeaux-Frieding's facts.

than an impoverished trace. Reconstruction in this theory consists of interpreting lower copies and (possibly) deleting higher ones. In this approach, for a question like (52) there are three copies of the fronted *wh*-phrase, as shown in the tree diagram in (53).

(52) Which girl did every boy kiss__?

(53)



Assuming that the *wh*-phrase stops in a position above the VP on its way to COMP, an under the assumption that movement leaves a copy, there are three copies of the wh-phrase extracted from the object position in (52), as indicated in (53)[10]. I will assume that the relevant intermediate position is the outer specifier of the vP phrase postulated in current minimalist views of phrase structure. In languages like English, the highest copy is phonologically prominent (i.e pronounced), whereas the lower copies are phonologically opaque (unpronounced), I indicate this in (53) by shading the lower copies. Reconstruction exist because the lower copies can be prominent in the semantic component of the grammar.

[10] The assumption that *wh*-movement stops in a position between the VP and the derived surface position of the subject in the clause will be substantiated in chapter 3, sections 1.1, and 1.1.1.

I will assume that like in the case of other quantifiers, the scope of a *wh*-phrase is associated with the interrogative determiner. A natural assumption then is that SR and PL-readings in particular, involve the interpretation of lower copies of the interrogative determiner.

Notice that under this theory, there is, in principle, a way of treating the reconstruction asymmetry discovered by Cinque (1990) discussed in the previous section. It is possible to interpret, for instance, the highest copy of the interrogative determiner, and the restriction of one of the lower copies. This will give us the case in which BTR obtains, but SR doesn't. The opposite situation in which SR obtains without forcing BTR requires that we interpret only the restriction of the higher copy and the determiner of one of the lower copies. The latter type of reconstruction seems problematic, however, for two reasons. First, at least the determiner of the *wh*-phrase must be interpreted in the COMP position to provide the question meaning for the sentence, and second, the variables associated with the determiner-less highest restriction that such an analysis requires will be left free since they will not occur in the syntactic domain of any determiner.

I will assume therefore that reconstruction does not operate in such a fashion. In the view of syntactic reconstruction under the copy theory of movement, adopted here, it follows then that SR will always trigger BTR effects, as we saw in sections 1.1-1.3., although the opposite may not be true.

1.7. Summary.

In the first part of this chapter we have seen that in questions with quantifiers reconstruction of the wh-phrase below the quantifier is necessary for the question to be ambiguous. In particular, we saw that when reconstruction of the wh-phrase is blocked by the effects of BT(A), section 1.1, BT(C), section 1.2, or when variable binding leaves a wh-phrase trapped in the COMP position of a question in a raising construction, section 1.3, the PL-interpretation is missing from the corresponding questions. The data discussed in those sections, specially those discussed in sections 1.1-1.2, shows that the three approaches discussed in chapter 1 do not constitute proper treatments of wh-

quantifier interaction even if one takes their fundamental assumption to be correct. As we saw in chapter 1, the fundamental assumption behind these approaches is that nesting configurations are sufficient for PL-interpretations to be available. All the examples in sections 1.1-1.2 instantiate cases of nesting as understood in these approaches but only some of them are ambiguous; namely those where reconstruction is not blocked.

We also saw at the end of section 1.4, where the difference between *each* and *every* is discussed, that examples that pose a problem for the subject-object asymmetry, construed as an absolute generalization, are very easily handled in the reconstruction approach by assuming a different syntax for *each* and *every* that is independently motivated, and by assuming that reconstruction is constrained by the presuppositionality or definiteness of the wh-phrase. All in all, then, the reconstruction view of PL-interpretations is superior to the alternative approaches discussed in chapter 1.

2. Semantics

In the sections so far addressed in the present chapter, we considered evidence showing that in questions with quantifiers, scope ambiguity arises out of the possibility of reconstructing the *wh*-phrase below the quantifier. In particular, we saw that one of the readings of questions with universal quantifiers, namely the PL-reading or distributive-question interpretation, requires syntactic reconstruction of the *wh*-phrase below the quantifier. In the sections to come, I will argue that syntactic reconstruction is necessary because of the way in which PL-readings of the relevant questions are obtained in the semantics. In particular, I will argue that PL-readings in questions with universal quantifiers are possible because *wh* determiners introduce both a choice function variable and an implicit individual variable, much in the way that Kratzer (1998) propose for indefinites. For PL-readings to be possible, the implicit variable must be bound by a quantifier. This means that one of the copies of the *wh*-phrase, including the determiner, must occur inside the c-command domain of the quantifier so that the implicit variable can be bound. Syntactic reconstruction will be necessary because unless one of the copies of the *wh*-phrase occurs inside the scope of a quantifier, binding of the implicit variable will not be possible. A skolemized choice function treatment of PL-readings in questions

with quantifiers will, thus, have the advantage of grounding the need of syntactic reconstruction on the semantics of the relevant representation.

The rest of this section is organized as follows. In section 2.1., I will introduce the choice function analysis of wh-phrases and indefinites. In Section 2.2., I will discuss Kratzer's (1998) particular analysis of indefinites in terms of skolemized choice functions, extending it to the semantics of PL-interpretations in *wh*-quantifier interactions (section 2.3.). I will then show that PL-interpretations have the same distribution as the bound readings of other expressions assumed to involve the use of implicit variables in the semantics (subsection 2.4). It will then be argued that the generality of PL-readings requires that we treat all *wh*-phrases in terms of choice function, contra Reinhart (1997).

2.1. The Choice-function Analysis of Wh-phrases and Indefinites.

Reinhart (1992, 1994, 1997) has proposed that we use choice functions in representing indefinites and *wh*-phrases semantically in order to solve the problem of wide scope indefinites and *wh* in situ. It is well known that indefinites and wh-in situ can take wide scope more easily than other quantifiers can and across environment where movement operations are not plausible (i.e., islands environments). Consider the examples below. The examples used in this section are taken from Reinhart (1997) unless indicated otherwise.

(54) a. Everyone reported that Max and *some lady* disappeared.
b. Most guests will be offended if we don't invite *some philosopher*
c. All students believe anything that *many teachers* say.

(55) a. Who reported that Max and *which lady* disappeared?
b. Who will be offended if we don't invite *which philosopher*?
c. Who believes anything that *who* says?

The example in (54a) allows an interpretation in which there is a specific woman of which everyone reported that Max and her disappeared. This means that the italicized

existential has the matrix universal in its scope[11]. Similarly in (54b,c) the italicized existential can also have the matrix quantifiers in their scope.

The same point can be made with the examples in (55). All the interrogative sentences here can be interpreted as matrix multiple questions requiring PL-answers rather than single answers. Since Baker (1968, 1970) it is known that a *wh*-phrase has matrix scope if values for the elements in the set of the *wh*-phrase are provided in the answer. This means that in (55) the italicized *wh*-phrase takes scope with the matrix *whs* since their values are also provided in the answers: the question requires answers involving pairs matching elements in the restrictors of the two *wh*-phrases. The situation in (54)-(55) contrast with the case of strong quantifiers, which are not able to take the same wide scope from the same syntactic position[12]:

(56) a. Someone reported that Max and *all the ladies* disappeared.

b. Someone will be offended if we don't invite *most philosophers*.

c. Many students believe anything that *every teacher says*.

Unlike the case in (54)-(55), the italicized quantified NPs in sentences like those in (56) cannot have the matrix quantifiers in their scope. Rodman (1976) discovered that the cases in which quantifiers fail to scope over a particular position p from their surface position p' correlates, to some extent, with the fact that extraction from p' over p is not acceptable. Thus, extracting a *wh*-phrase from the position of the italicized NPs in (56) is unacceptable, as my modification of the relevant examples show.

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[11] For some time in the literature of the late seventies it was argued that it was not clear to speak of wide scope of indefinites that occur in the narrow scope of a universal quantifier, see e.g., Reinhart (1976, 1979), and Cooper (1979), given that the wide scope of the existential in such configurations entails the narrow scope, and the opposite situations can also be found in similar examples. However, both Fodor and Sag (1982), and Ruys (1993) show that the entailment argument does not hold even in the simplest cases when the indefinite occurs in the scope of a non-monotone quantifier. Thus, for example, none of the readings of *exactly half the boys kissed some girl* entails the other. See Ruys (1993) and Reinhart (1997) for extensive discussion of the point.

[12] Recall that given clause-boundedness, universal quantifiers can't even scope out of finite *that*-clauses (never mind out of (strong) islands environments).

(57) a. *Who did someone report that Max and __ disappeared?

b. *Who will someone be offended if we don't invite__?

c. *Who do many students believe anything that __ says?

A plausible hypothesis to explain Rodman's correlation is that quantifiers get their scope via the same mechanism that move phrases overtly. This hypothesis was in fact entertained in the syntactic literature in the late seventies and eighties and it was proposed, as we saw in Chapter 1, that the syntactic rule of Quantifier Raising (QR) invisibly raises quantifiers to the site where they take scope at LF (e.g., May 1977, 1985). Since QR was considered a particular instantiation of the rule Move α, and since Move α obeys Ross's (1967) island constraints, as shown by the ungrammaticality of (57), it follows that QR out of islands will not be possible either.

However, the examples involving existentials and *wh* in situ in (54)-(55) have been a problem in the way of the QR analysis of scope assignment, ever since the approach was first proposed. If quantifiers get their scope via QR, and if QR out of islands is not possible, how can the existential and *wh* in situ in (54)-(55) get matrix scope? Reinhart's answer to this question was that indefinites are ambiguous between the ordinary generalized quantifiers interpretations and a choice function interpretation. Under their generalize quantifier guise, indefinites and *wh*-phrases behave like strong quantifiers and their scope possibility is assumed to be sensitive to islands. However, given a choice function analysis, one can interpret indefinites and *wh*-phrases in situ while still guaranteeing them out-of-island scope. Choice functions are defined as in (58).

(58) 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, p.372)

Let us consider how choice functions are used to generate wide scope for existentials and *wh*-phrases. Consider first a simple example like the one in (58) involving an indefinite in object position:

(58) Every lady read *some book*

We are interested in the wide scope representation of the object indefinite. That particular interpretation can be represented as in either (59a,b).

(59) a. $\exists f(\mathrm{CH}(f) \wedge \forall z\ (\mathrm{lady}\ (z) \rightarrow z\ \mathrm{read}\ f(\mathrm{book})))$

b. $\exists x(\mathrm{book}(x) \wedge \forall z\ (\mathrm{lady}\ (z) \rightarrow z\ \mathrm{read}\ x))$

In (59a), a choice function variable applies to the set of books denoted by the wh-restrictor and returns a member from that set. In Reinhart's view, the choice function variable can be bound by an existential quantifier over choice function that is "arbitrarily far away". She assumes that the existential quantifier is provided by an operation of existential closure as in Heim (1982), applying, arbitrarily, at any point in the structure. Widest scope is the result of existential closure applying at the top most level. Out-of-island scope results when the indefinite or *wh*-phrase inside the island is interpreted via choice function and the function variable is existentially closed outside the island.

Reinhart argues that when we are forced to interpret indefinites and *wh*-phrases in situ, the choice function approach derives the right semantics of the relevant sentences. She further argues that an alternative approach in terms of unselective binding, yields very weak truth/answerhood conditions when the indefinite or *wh*-in situ occurs in the antecedent of a conditional, a downward entailing context, more generally, or even a modal environment[13]. To see this, consider the example in (60) involving a *wh* in a conditional.

(60) Who will be offended if we invite which philosopher?

Paraphrase under the UB approach:

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[13] But see Cresti (1997) who defends an unselective binding approach by amending it with the wh-phrases are presuppositional and incorporating a mechanism of presupposition projection. The approach may indeed be immune to Reinhart's strongest objections.

(61) For which ⟨x, y⟩, if we invite y and y is a philosopher, then x will be offended

Paraphrase under the CF approach.

(62) For which ⟨x, *f*⟩ *f* is a choice function, and if we invite *f*(philosopher), x will be offended .

Using a Karttunen style semantics for question, (61) and (62) becomes (63) and (64) respectively.

(63) λp∃⟨x, y⟩ [true (p) ∧ p = ((we invite y and philosopher (y)) →(x will be offended)).

(64) λp∃⟨x, *f*⟩ [CH (*f*) ∧ true (p) ∧ p = ((we invite *f*(philosopher)) →(x will be offended)).

In Karttunen's semantics for questions, a question denotes the set of true propositions that can be given as answers to the question. When (60) is paraphrased as in (61), the function associated with the question, i.e. the characteristic function of the set of proposition denoted by the question, will be (63). But in (63) the restriction *philosopher* occurs in the antecedent of a conditional. This means that any individual that does not satisfy the restriction will automatically render the proposition true and the resulting true proposition will be a member of the set denoted by the question. So, as Reinhart points out, if one chooses Donald Duck to take the place of y in (63), one should be able to answer the question in (60) with an answer like (65), by the mere fact that Donald Duck is not a philosopher.

(65) Bob Stalnaker will be offended if we invite Donald Duck.

Intuitively, answers like (65), where we are pairing people and non-philosophers do not qualify as possible answers for a question like (60). The Donald Duck problem, as this

result has come to be known, does not arise under the choice function approach[14]. The Karttunean characteristic function of the set denoted by the question in (60) is (64). Here a choice function variable applies to the set denoted by the noun *philosopher* in the antecedent of the conditional and returns a member of the set. The propositions in the set denoted by (60) will be those true propositions such that for some pair ⟨x, *f*⟩, x an individual and *f* a method for choosing an element from the set of philosophers, x will be offended if we invite the individual chosen by the method *f*. Donald Duck will never be chosen by the method, because he is not in the extension of the noun *philosopher.*

2.2. The Donald Duck Problem and A-bar Reconstruction.

In the previous section we saw that one runs into the Donald Duck problem when one has to interpret the restriction of a wh-phrase in situ under certain specific environments (e.g., a modal, or a downward entailing environment). In principle, the same problem should arise in the case of partial wh-reconstruction inside the relevant environment. That is, some version of the Donald Duck problem should arise in cases in which one restores wh-material to some lower positions occurring in the relevant contexts.

In developing a theory of wh-reconstruction one should therefore bear in mind the potential fatal consequences of this problem. In the syntactic section of this chapter, we saw that syntactic reconstruction is necessary for PL-readings to be available. One way to escape a potential encounter with some version of the problem as it concerns the representation of PL-interpretations in questions with quantifiers is to represent whatever part of the wh-phrase is reconstructed below the universal quantifier with choice

[14] Not every approach that reconstructs the restriction of a wh-phrase into the antecedent of a conditional or downward entailing context runs into the Donald Duck problem. Beck and Rullman (1997), for instance, develop an approach to reconstruction in which the reconstructed restriction of a *which*-phrase gets interpreted as a definite description. In this analysis a question like *Which man isn't happy?* ends up being interpreted as *which man x is such that it is not the case that the man x is happy*?. The Donald Duck problem does not arise in this case. In this dissertation I will use the choice function mechanism because if quantifying in is not possible, as have been arguing, it is not even possible to describe PL-readings without the use of functions. This is not to say, however, that Beck and Rullman reconstructed restrictions, analyzed as definite description, might have some functional version.

functions, just as Reinhart does with indefinite and wh in situ. However, it is obvious that the simple choice functions used by Reinhart will not be enough for capturing the semantics of PL-readings in questions with quantifiers. This is because the situation that the simple choice functions are designed to deal with, are, the opposite of the situation we have when considering PL-readings. Simple choice functions are designed to capture the situation in which the existential has scope independent from some other quantifier in the sentence (i.e. widest scope), although it appears to take narrower scope than that quantifier. PL-readings constitute the inverse case: a situation in which the existential (i.e., *wh*-phrase) is dependent upon some other quantifier, while appearing to take wider scope than the given quantifier. As Reinhart herself points out, in order to capture this last situation skolemization is necessary.

> The simple choice-functions I examine here are applicable strictly for the cases of independent (genuine) wide scope. For the 'dependent' wide scope, some equivalent of the more complex Skolem function must be used (i.e. the choice of members must be relative to a choice of value of some other variable).
>
> (Reinhart 1997, p. 373, Footnote 27)

The semantic analysis of the copies of wh-moved phrases that I will adopt in this dissertation will involve the use of skolemized choice-functions as developed in Kratzer (1998). I discuss her theory in the following section.

2.3. Kratzer's Theory Indefinites.

Fodor and Sag (1982) tried to explain the exceptional scope taking behavior of indefinites, illustrated in examples like (53)-(54), by claiming that such NPs are ambiguous between a quantificational and a referential interpretation. Under the quantificational interpretation the indefinites are taken to behave as any other quantifier, therefore, obeying island constraints. When indefinites are interpreted referentially, they

are like names, that is scope-less. Abusch (1993) and Ruys (1993), however, show that Fodor and Sag's theory needs to be modified and/or rejected partly because it predicts fewer readings than those found in examples like (66)

(66) Every professor will rejoice if *a certain student of his* cheats on the exam (Ruys, 1993, p.)

Under the ambiguity view of Fodor and Sag, the italicized indefinite in (66) should behave as a regular quantifier taking scope inside the if clause, or as a name, i.e. scope-less. There should not be an *intermediate reading*, that is, a reading in which the indefinite takes scope outside the *if*-clause, but below the matrix universal quantifier. (66), however, does have the intermediate reading. In that reading, each professor will rejoice if a specific student that he has in mind cheats on the exam, but not if any of his student at all does. Clearly in that interpretation the indefinite is outside the if clause and is dependent on the universal. So examples like (66) indeed constitute a problem for Fodor and Sag.

Kratzer (1998) considers a modification of Fodor and Sag (1982) to handle examples like (66). Like them, she assumes that indefinites are ambiguous between a specific and a quantificational reading. Unlike them, however, she assumes that the specific reading of an indefinite, rather than being referential, depends on choice-functions. Following Reinheart (1995), she takes certain indefinite articles (i.e., the determiners) to be pronominal elements denoting choice functions. In Kratzer's system, however, choice functions are not existentially closed, but are, rather, determined contextually. In addition, Kratzer argues that the problematic intermediate readings of indefinites that were a problem for Fodor and Sag are possible because of the possibility of an implicit (or explicit) variable associated with the indefinites.

The postulation of implicit variable seems necessary in the semantic treatment of a group of expressions discovered by Mitchell (1987). The relevant class of expressions contain adjectices like *local* and, Kratzer suggests, complex determiners like *a certain* (see Hinttika (1986) on the semantics of *a certain*). Consider the following example.

(67) Every president decorated *a local* hero

In (67) *a local* can be interpreted with respect to the utterance context and relates to the speaker's region or some contextually salient place. However, it can also have a bound reading in which it relates to the region of each president. That is, under the bound reading of *local*, each president decorated a hero that is local to his office or nation. Kratzer (1998) assumes that what is true for *local* is also true for specific determinters like *a certain* in general. She provides the representation in (68b) for the first part of sentence (67a), from Hintikka (1986).

(68) a. Each husband had forgotten a certain date -- his wife's birthday.

b. $\forall x$[husband(x) $\rightarrow$ had forgotten (x, f_x(date))]

The complex determiner *a certain* is represented in (68b) as a function variable. The implicit argument of the function appears as a subscripted variable. Since the implicit variable is bound by the quantifier, the choice function is skolemized or relativized to the value assignments of the quantifier. That is, for each member of the set of contextually relevant husbands, the choice function selects a member of the set of all dates relative to that husband.

The possibility of implicit variables solves the problem of intermediate readings that we considered in relation to examples like (66). In that example the appearance of an intermediate reading arises, in Kratzer's analysis, when the universal quantifier binds the implicit variable of the complex determiners *a certain* which applies to the set {students of x}, where x is also bound by the universal. Kratzer's approach has been defended over Reinheart's approach in Matthewson (1998), on the basis of empirical evidence from Salish. Chierchia (2000), however, discusses evidence that appear to support both approaches. Providing evidence that help us decide among these approaches is beyond the scope of my research. Rather I will adopt Kratzer's skolemized choice-function approach because it suits the purpose of my research better. Notice for instance, that the reading in (68b) is in essence a PL-interpretation. In that reading, the relation *forget* will match each element in the domain of the quantifier (i.e. husbands) with the date that the

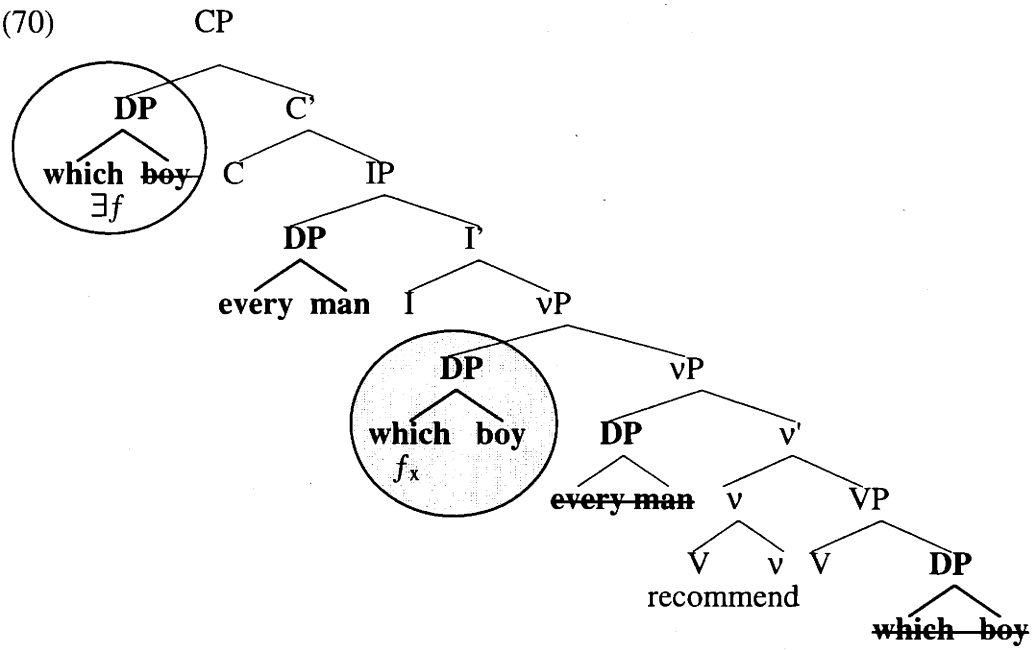
choice function selects relative to that element. The details of my proposal are elaborated in the following section.

2.4. A Choice Function Analysis of Wh-Quantifier interaction.

Recall that I am adopting the copy theory of movement, according to which movement creates more than one instance or copy of the displaced constituent. As it was mentioned in section 1.6., under the copy theory of movement reconstruction consists of the interpretation of a lower copy and the (possible) deletion of higher ones. In the first part of this chapter (sections 1.1-1.3.), I provided evidence showing that in questions with universal quantifiers, reconstruction of the *wh*-phrase below the quantifier is necessary for the PL-readings to be available. In the preceding two sections I consider the worry that a theory of reconstruction faces concerning the Donald Duck problem. One way to make reconstruction immune to this problem is by using choice functions in representing the semantics of copies left behind by *wh*-phrases (but see footnote 10). Given the need of reconstruction in the interpretation of PL-readings, and the worry of the Donald Duck problem, it is advisable to represent such readings via choice functions. We already saw in the previous section that Kratzer's (1998) skolemized choice functions essentially yield PL-readings when the implicit variable gets bound by a universal quantifier. I want to propose now that PL-readings involve the interpretation of two of the copies of the *wh*-phrase: a reconstructed copy, and the copy that has raised to the specifier of CP. The determiner of the reconstructed copy is represented in the semantics as a skolemized choice function applying to its argument NP. The copy in the specifier of CP position will bind the function variable. Consider the sentence in (69) with the corresponding representation in (70)

(69) Which boy did every man recommend?

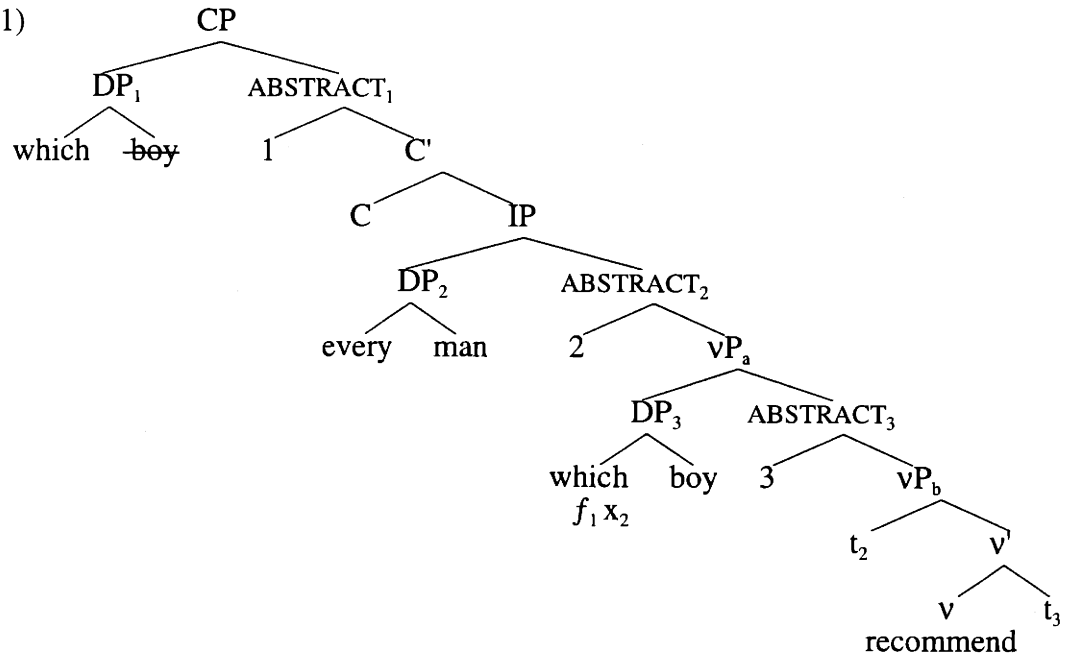
(70)



I will assume that the copies of the wh and the quantifier in theta position get replaced by individual variables[15]. The individual variable replacing the copy of *which boy* in object position of the verb gets bound by the lambda operator created by movement of that *wh*-phrase to the outer Spec of νP. This leaves us with only one copy of the *wh*-phrase in the c-command domain of the quantifier, namely the copy in the outer spec of νP. The *wh*-determiner of that copy is a choice function containing an implicit variable (i.e., a skolemized choice function). The function variable is bound by the *wh*-copy in the COMP position by analyzing the interrogative determiner there as a generalized quantifier over skolemized choice-functions. If the individual variable gets bound by the universal quantifier in the spec of IP, the result will be a PL-interpretation. In order to see how the semantic composition of a structure like (70) works, in more detail, I provide below a version of (69) in the so called transparent Logical Form (TLF) style.

[15] For expository purposes I will temporarily assume that the copies in theta-position get replaced by individual variables. Later in the dissertation, however, I will actually treat the relevant copies along the line suggested in Fox (2001) who proposes that such copies are converted into definite descriptions. I will defer introduction of Fox's mechanism to chapter 3, section 1.2., where I will consider a possible account for Longobardi's Observation introduced earlier in section 1.5.

(71)



There are several important assumptions underlying the present analysis which I will try to make explicit below. First, I assume that the traces in theta positions (i.e., t_3, and t_2) are respectively bound by the lambda operator under the $ABSTRACT_3$ node, and by the one in the abstract created by *every man* in [Spec IP][16]. I will assume that the two copies of *which boy* in (72) are interpreted differently. The lower copy, i.e. the one sister to $ABSTRACT_3$ is interpreted by analyzing the determiner as a skolemized choice-function variable and applying it to the set denoted by the noun *boy*.

The choice function variable gets abstracted over at the CP level, by the lambda abstract created by the *wh*-copy in [Spec, CP]. Skolemized choice functions are objects of type <e, <<e,t>, e>>. Henceforth I will abbreviate this type as τ_{scf} (i.e., the type of skolemized choice functions).

From Karttunen's meaning for the interrogative complementizer, we know that C' denotes a question, i.e. a set of propositions (type <<s,t>,t>), hereon abbreviated to τ_q as in Heim (2001). Following a parallelism with abstraction over individual variables,

[16] My use of the term trace here has not theoretical status. Strictly speaking there are not traces, but copies of moved constituents given that I am assuming the copy theory of movement. I will call a copy a trace when the status of the given copy is not important for the purpose at hand.

ABSTRACT$_1$ must denote a function from skolemized choice functions to question denotations (type $<\tau_{scf}, \tau_q>$). The DP *which ~~boy~~* in [Spec, CP] should then be of type $<<\tau_{scf}, \tau_q>, \tau_q>$ i.e., a function from function from skolemized choice functions into questions denotations into question denotations.

This is quite parallel to the type of normal generalized quantifiers of type <<e,t>, t> with the difference that instead of t, we have the type of questions and instead of individuals of type e, here we have skolemized choice functions. The DP which ~~boy~~ in [Spec, CP], can thus be thought of as an interrogative generalized quantifier over choice functions[17]. I will also assume that the deleted restriction of an interrogative DP in [Spec, CP] gets interpreted as the choice predicate CH_S, restricting the determiner in that position. The choice predicate denotes the property that all skolemized choice-functions have. That is the predicate denotes a set of skolemized choice functions (type $<\tau_{scf}, t>$). Interrogative determiners thus denote a function from sets of skolemized choice functions (of type $<\tau_{scf}, t>$) into interrogative generalized quantifiers over choice functions. A more detailed bottom-up analyzis of the semantic composition of the TLF in (71) is given below.

(72) a. $[\![vP_b]\!]$ = **recommend'** (z, y)

b. $[\![ABSTRACT_3]\!] = \lambda y$[**recommend'**(z, y)] — by Lambda Abstraction (LA) over the object variable

c. $[\![DP_3]\!] = g_z$(**boy'**)

d. $[\![vP_a]\!] = \lambda y$[**recommend'**(z, y)] (g_z(**boy'**)) — by Function Application (FA)

= **recommend'**(z, g_z(**boy'**)) — by Lambda Conversion (LC)

e. $[\![ABSTRACT_2]\!] = \lambda z$[**recommend'**(z, g_z(**boy'**)] — by LA over the subject variable and the implicit variable in the wh-phrase

[17] Compare this analysis to that of Heim (2000, 2001) who analyzes wh-DPs as being of the type $<<e, \tau_q>,\tau_q>$, where τ_q is the type of questions (i.e., <<s,t>,t>). The only difference between this analysis and my own is that Heim's is using quantification over individuals for the issues she discusses, whereas my analysis uses higher order quantification (i.e. quantification over choice functions) in order to capture the semantics of PL-interpretations.

f. $[\![DP_2]\!] = \lambda P_{<e,t>}.\forall x[\mathbf{man'}(x) \rightarrow P(x)]$

g. $[\![IP]\!] = \lambda P_{<e,t>}.\forall x[\mathbf{man'}(x) \rightarrow P(x)]$ ($\lambda z[\mathbf{recommend'}(z, f_z(\mathbf{boy'}))]$)

by FA

$= \forall x[\mathbf{man'}(x) \rightarrow \mathbf{recommend'}(x, f_x(\mathbf{boy'}))]$ by Two Applications of Lambda Conversion (LC)

h. $[\![C]\!] = \lambda q_{<s,t>}.\ \lambda r_{<s,t>}[\mathbf{true'}(r) \wedge r = q]$ by Lexical meaning of *C*

i. $[\![C']\!] = [\![C]\!]\ ([\![IP]\!])$ by FA

$= \lambda q_{<s,t>}.\ \lambda r_{<s,t>}[\mathbf{true'}(r) \wedge r = q]\ (\forall x[\mathbf{man'}(x) \rightarrow \mathbf{recommend'}(x, f_x(\mathbf{boy'}))])$

by (73g, h)

$= \lambda r_{<s,t>}[\mathbf{true'}(r) \wedge r = \forall x[\mathbf{man'}(x) \rightarrow \mathbf{recommend'}(x, g_x(\mathbf{boy'}))]]$

by LC

j. $[\![ABSTRACT_1]\!] = \lambda g_{<\tau_{scf}>}.\ \lambda r_{<s,t,>}[\mathbf{true'}(r) \wedge r = \forall x[\mathbf{man'}(x) \rightarrow$

$\mathbf{recommend'}(x, g_x(\mathbf{boy'}))]]$ by LA over the choice function variable

k. $[\![DP_1]\!] = \lambda F_{<\tau_{scf,\ \tau_q}>}.\ \lambda p_{<s,t>}\exists f[CH_S(f) \wedge F(f)(p)]$

l. $[\![CP]\!] = \lambda F_{<\tau_{scf,\ \tau_q}>}.\ \lambda p_{<s,t>}\exists f[CH_S(f) \wedge F(f)(p)]\ (\lambda g_{<\tau_{scf}>}.\lambda r_{<s,t>}[\mathbf{true'}(r) \wedge$

$r = \forall x[\mathbf{man'}(x) \rightarrow \mathbf{recommend'}(x, g_x(\mathbf{boy'}))]])$

by FA

$= \lambda p_{<st>}\exists f[CH_S(f) \wedge \lambda g_{<\tau_{scf}>}.\lambda r_{<st>}[\mathbf{true'}(r) \wedge r = \forall x[\mathbf{man'}(x) \rightarrow$

$\mathbf{recommend'}(x, g_x(\mathbf{boy'}))]]\ (f)(p)]$ by LC

$= \lambda p_{<st>}\exists f[CH_S(f) \wedge \lambda r_{<st>}[\mathbf{true'}(r) \wedge r = \forall x[\mathbf{man'}(x) \rightarrow$

$\mathbf{recommend'}(x, f_x(\mathbf{boy'}))]]\ (p)]$ by LC

$= \lambda p_{<st>}\exists f[CH_S(f) \wedge \mathbf{true'}(p) \wedge p = \forall x[\mathbf{man'}(x) \rightarrow \mathbf{recommend'}(x, f_x(\mathbf{boy'}))]]$

by LC

The last line in (72l) repeated below as (73) correctly captures the PL-interpretation of question (69), also repeated below for convenience.

(69) Which boy did every man recommend?

(73) $\lambda p_{<st>}\exists f[CH(f) \wedge \mathbf{true'}(p) \wedge p = \forall x[\mathbf{man'}(x) \rightarrow \mathbf{recommend'}(x, f_x(\mathbf{boy'}))]]$

The formula in (73) is the characteristic function of the set of propositions denoted by the question in (69). It takes a proposition p and includes it in the relevant set if p is true and for some function f, p equals the proposition in the question nucleus in (73). This means that (69) denotes the set in (74).

(74) {p: p is true and for some skolemized choice function f, p = $\forall$x[**man'**(x) $\rightarrow$**recommend'**(x, f_x(**boy'**))]}

When we relativize (74) to a model M in which the men are John, Bill, and Mario; and the boys are Bobby, Johny, and Billy, and where we let f_x(***boy'***) select Billy relative to John; Bobby, relative to Bill; and Johny relative to Mario; (74) is equivalent to the set in (75).

(75) {John recommended Billy, Bill recommended Bobby, and Mario recommended Johny }

(75) is just the conjunction containing each particular proposition resulting from every assignment of a value to the variable x and letting the choice function select a member from the set of boys relative to that assignment. This is what a PL-reading is. (74) and the corresponding sets in (74)-(75), thus, correctly captures the meaning of question (69) under the PL-interpretation.

2.5. PL-interpretations and the Binding of Implicit Variables.

In the previous chapter we considered a semantic of questions with universal quantifiers that relies on the assumption that *wh*-determiners contain implicit variables, just like complex determiners like *a certain* (see Hinttika (1986)) do, which, when bound by a universal quantifier, results in a PL-interpretation. This view of PL-interpretation makes the prediction that such readings should have the same distribution that the bound reading of expressions like *a certain*, *local*, *different*, or the dependent reading of

definite NPs have. In particular the correlation in (77) is a natural expectation of the theory just sketched.

(76) Both PL-readings and the bound readings (BR) of expressions like *a certain* should be impossible when reconstruction below the binder of the implicit variable is impossible.

In this section, I will show that the prediction in (76) is in fact borne out providing strong support for the view of PL-readings presented above. Let us begin by considering the distribution of the BR of the relevant expressions in the context of the raising construction. CDR stands for contextually determined reading.

(77) a. **A local hero** seems to have visited **every president**.

(CDR, BR)

b. **A different bodyguard** is expected by the director to protect **each celebrity**.

(CBR, BR)

c. **A certain fan** strikes me as resembling **each celebrity**

(CBR, BR)

e. (In this year Miss Universe contest,)
The father is expected (by the organizers) to walk **each candidate** onto the stage[18].

---

[18] Danny Fox (p.c.) points out that the bound reading of the definite in (77e) is not so readily available. The native speakers I consulted, however, find that the definite can in fact have a bound reading in this examples. The corresponding examples in Spanish also allow for the relevant reading without any problem as in the following example.

(vi) Se supone que el padre acompane a cada cadidata hasta el escenario.
it is supposed that the father accompany each candidate to the stage
'The father is supposed to accompany each candidate onto the stage.'

(CBR, BR)

I will take these facts to indicate that the definite article may also contain implicit variables that when bound by a given quantifier results in a dependent or bound reading of the definite description.

(*CBR, BR*)

All of the DPs in (77) can be interpreted with respect to the utterance situation, i.e., they can have a contextually determined reading (CDR), or they can receive a quantified or bound (dependent) interpretation (henceforth BR). In (77a), for instance, *local* can refer to the region of the speaker, or it can refer to each president's region. Similarly, the definite DP in (77e) allows both a reading in which the definite DP *the father* refers to some contextually salient individual in the *father of* relation (but not necessarily) with the candidates, or it can have a bound reading in which for every candidate it is the case that the father of that candidate is expected to walk her to the stage.

This is quite parallel to the fact that, as we saw in section 1.3., constituent questions in the raising constructions are ambiguous between a single answer, the independent reading of the *wh*-phrase, and the PL-answer or bound reading of the *wh*-phrase, given our analysis in terms of implicit variables:

(78) **Which body guard** is expected by the director to protect **each celebrity**?

(SA, PL)

Consider now what happens when the subject-to-subject raised DP in the raising construction is trapped in the matrix clause. The bound reading of the (in)definite DPs in (77) disappears just as is the case with PL-readings as we saw before.

(79) a. **A local hero**$_k$ seems to his$_k$ mother to have visited **each president**.

(*CDR, *BR*)

b. **A different bodyguard**$_k$ is expected by her$_k$ superior to protect **each celebrity**.

(*CBR, *BR*)

c. **A certain fan**$_k$ strikes herself$_k$ as resembling **each celebrity**

(*CBR, *BR*)

e. (In this year Miss Universe contest,)
the father$_k$ is expected by his$_k$ brother to walk **every candidate** onto

the stage.

(*CBR, *BR*)

(80) **Which body guard**$_k$ is expected by her$_k$ superior to protect **each celebrity**?

(SA, *PL)

In (79)-(80) I have placed a bound pronoun for the subject-to-subject raised quantificational DPs to bind. This has the effect of preventing reconstruction into the embedded clause since otherwise the pronoun will be left without a binder. Neither the BR of the indefinites in (79), nor the PL-reading of the question in (80) is possible in such circumstances. This shows that both reading require reconstruction below the quantifier in sentences like (79)-(80), which makes sense if the two readings arise through the same syntactic, and/or semantic mechanism. (78)-(80) thus show that the prediction in (77) is borne out.

2.5.1. Why WCO is Irrelevant.

In section 1.4., and in Chapter 1, sections 1.4.1. and 2.6., we saw that under certain conditions, questions with quantifiers in object position are ambiguous allowing a PL-interpretations. One such condition is the case in which the object quantifier is *each*, as in (81a), the other condition is when the wh-phrase is non-referential, as in (81b).

(81) a. **Which professor** recommended **each student**? (SA, PL)

b. **How many professors** recommended **every student** (SA, PL)

In section 1.4., I suggested that the quantifier *each* moves to a phrase located in the complementizer system of the clause in the sense of Rizzi (1999). Under this analysis the *wh*-phrase only needs to reconstruct to the [Spec, IP] position in order to get within the c-command domain of *each* at LF and get its implicit variable bound by the universal resulting in a PL-interpretation. A question that arises in connection with examples like (81) is why weak cross over (WCO) does not rule out the possibility of the PL

interpretation given that object quantifiers cannot bind overt variables in the subject position without showing WCO effects:

(82) a. ?*Her father walked each bride to the altar in the wedding ceremony

The sentence in (82) is to some extent deviant and this is presumably imputable to the quantifier having to cross over the site of the variable with which it is co-indexed in order for binding to be possible. A theory of the PL-interpretation of sentences like (81) which links the relevant reading to the binding of an implicit variable in the *wh*-determiner, by the object quantifier, must therefore explain why WCO is not relevant in that particular case. This question receives a straightforward answer if one assumes with Safir (1984) that WCO effects hold in cases of "*mixed dependencies*" in which an operator binds both an overt and a null variable, but not in cases in which both variables are null. I will show that Safir's observation is true of all syntactically null variable including the implicit variables of expressions like local, different, and the dependent readings of definite NPs. Consider the following contrast based on modifications of Safir's examples.

(83) a. ?*Her father walked each bride to the altar in the wedding ceremony
b. ?* Which bride did her father walk to the altar in the wedding ceremony?

(84) a. The father walked each bride to the altar in the wedding ceremony.
b. Which bride did the father walk__ to the altar in the wedding ceremony.

The sentences in (83) are deviant where the object operator is binding an overt pronoun in subject position at LF. In this case, the operator is binding variables of different kinds: one overt (the pronoun), and the other null (the *wh*-trace). According to Safir's analysis, that situation is what the principle determining WCO penalizes. The examples in (84), however, show that in exactly the same conditions, an object operator can bind an implicit variable in the subject position without any problem. This is because in those examples the relevant operators will bind two variables of the same kind at LF:

the implicit variables and the traces. In the examples in (84) we are interested in the dependent reading of the definite NP. In (8a) the relevant reading is the one in which each bride is such that her father walked her to the altar. Similarly (84b), under the relevant reading, asks which bride is such that her father walked her to the altar. Clearly in these interpretations, the implicit variable of the definite NP is bound by the object operator, which has crossed over it at some point in the derivation, without resulting in the WCO flavor found in (83). Exactly the same point can be made by the distribution of expressions like *local* and *different*. Consider the following.

(85) A local/different hero had dinner with each president.

In (85) *local* and *different* can be interpreted both with respect to the utterance situation or they can be bound by the quantifier *each president.* Under the bound reading of *local*, for instance, the sentences asserts that for each president, a hero from the president region, had dinner with him. As we saw before, from Hinttika (1986) to Kratzer (1998), the analyses of the bound readings of expressions like *local* have been developed in terms of implicit variable.

If the binding of the implicit variable of *local* is what makes the bound reading possible in (85), one has to conclude that WCO effects do not affect implicit variables, since the object quantifier in that example has to cross over the variable in order for binding to be possible and no WCO effects obtain. Sentences like (82)-(85), therefore, show that crossing over null variables does not lead to WCO effects as is the case when the variable is an overt pronoun. Safir (1984) discusses many examples in support of his observation which include, among other constructions, parasitic gaps environments and so called *PRO gates* (Higginbotham 1980). Below is an example of the latter type

(86) a. ?? Who$_i$ did [his$_i$ getting his$_i$ car fixed] upset e$_i$?

b. Who$_i$ did [e$_i$ getting his$_i$ car fixed] upset e$_i$? (Safir 1984, pp. 611-612)

Higginbotham (1980) points out that sentences like (86a) exhibit the familiar WCO effects. This is understandable since the *wh*-phrase, which is extracted from the

object position of *upset*, has crossed over the pronoun in the subject position of the gerundive nominal with which it is co-indexed. The surprising fact relevant to our discussion is that, as Higginbotham notes, examples like (86b) contrast minimally with examples like (86a) in not showing the familiar WCO effects.

The contrast can be explained if a WCO constraint holds for the overt pronoun in (86a), but not of the null one in (86b) as in Safir's proposal. I conclude therefore that the binding of an implicit variable in subject position by a quantifier in the object position is not subject to whatever constraints in the grammar regulates WCO effects. This is why the availability of the PL-reading of questions like (81), with the quantifier *each* in object position, does not correlate with the WCO judgments resulting from the same quantifier binding an overt pronoun as we saw in (82)-(83) and in Chapter 1, Section 1.3., when we evaluated the prediction of the WCO approach to *wh*-quantifier interactions.

2.6. Choice Functions and the Generality of PL-interpretations.

Scope ambiguity in questions with quantifiers is not restricted to the simple cases considered so far involving arguments *wh*-phrases an quantifiers. As noted by May (1985), the ambiguity is found with adverbial *wh*-phrases as well, and in cases in which the quantifier is not a subject. Consider the examples below.

(87) a. Where did every student go for his summer vacation? (SA, PL)
b. When did every lawyer see the defendant? (SA, PL)
c. When did the defendant see every lawyer? (SA, PL)

(88) a. Why did every student chose the major that his brother chose? (SA, PL)
b. How did every mechanic fix his own car? (SA, PL)
c. How many students did every professor recommend (SA, PL)
d. How much beer did every guest drink? (SA, PL)

All the sentences in (87) and (88) are ambiguous between a single answer, and a PL-interpretation as indicated in parenthesis. If the PL-interpretations involves analyzing one

of the copies of the *wh*-phrase as a skolemized choice-function variable and having it bound from the COMP position, as I have argued above, then there must be a choice function analysis for *wh*-phrases in general.

I will therefore assume contra Reinhart (1992) that such analysis is in fact possible. In particular I will assume that all *wh*-phrases can in principle be construed as containing an abstract restriction along the lines indicated in (89). The *wh*-determiner will provide the function variable that will apply to the set denoted by the null abstract restriction. The PL-reading will arise when the implicit variable of the *wh*-determiner gets bound by the universal quantifier. I will assume that the *wh*-determiner is a complex determiner consisting of a *wh*-feature and an existential determiner of the *some* type. I will indicate this by subscripting some to the *wh*-feature.

(89) The inner composition of wh-phrases.

a. [Wh_{some} one] =	Who
b. [Wh_{some} thing] =	What
c. [Wh_{some} place] =	Where
d. [Wh_{some} time] =	When
e. [Wh_{some} manner] =	How
f. [Wh_{some} reason] =	Why
g. [$Wh_{some\ unique}$(noun)] =	Which (noun)
h. [Wh_{some} amount of (count noun)]	How many (noun)
i. [Wh_{some} amount of (mass noun)]	How much (noun)

Notice that the posited null restriction does some semantic work for us in the case of every type of *wh*-phrase including non-referential adjuncts like *how* and *why*. For instance, the answers to interrogatives containing such adjuncts are also restricted. A question headed with *why* is a question about reasons and not manners, and the opposite is true of a question headed by how. What this means is that *why* and how also require semantic restrictions. Now once the restriction is required semantically, I do not see *why* a choice function analysis allowing the *wh*-part to apply to the abstract restriction should

be excluded. I will therefore assume a choice function analysis, without further discussion, for all *wh*-phrases under the PL-interpretations on interrogatives with quantifiers.

2.7. The Relationship Between Pair-list readings and Functional Readings.

Recall that a question like (90a) below, repeated from Chapter 1, allows any of the interpretations in (90b-d).

(90) a. Who does every man love __?
b. Mary (SA)
c. Bill, Mary; Paul, Susan; John, Anna; ... (PL)
d. his wife (FA)

In previous sections, I have tacitly addressed the differences between the PL-reading and the single answer (SA) interpretation of such questions. PL-readings arise when the wh-phrase can reconstruct below a quantifier in the sentence since such interpretations require binding of the implicit variable of the *wh*-phrase by the quantifier. SAs do not require binding of an implicit variable and can thus occur in the absence of a universal quantifier. The objective of the present section is to address the question of what the relationship between the PL-reading and the FA is.

There have been three types of implicit or explicit positions with respect to this question. The first position, call it Position 1, assumes that that there is no relationship between the two types of readings. This approach is advocated for instance in Groenendijk and Stokhof (1984), henceforth G&S, who reserve the use of functions for the representation of functional readings as in (90c), but use a different semantic and syntactic procedure to represent PL-readings, namely a procedure that involves quantifying in the quantifiers over the interrogative sentence. The second view, call it Position 2, defended in Engdahl (1986), and Chierchia (1991), is that both functional readings and PL-readings are instances of the same semantic representation involving some variant of the skolem functions. In this approach, the relevant distinction is that one can describe a function in two ways: by providing the extension of the function in the

actual world, which is a list of ordered pairs (i.e. a PL-reading), or by providing the intension of the function, i.e., by naming the function (i.e. the functional reading). The two positions are antithetical, making, therefore, different predictions, and yet a third view, call it Position 3, has tried to incorporate features of both approaches by claiming that although a semantic representation involving functions underlie both PL-interpretations and functional readings, the syntactic and semantic derivation of the two readings differ. This last approach is advocated in Chierchia (1993), Dayal (1996), and Sharvit (1997, 1999). Before I present my own view on the matter, I will briefly discuss some features of these three approaches to provide the necessary background relevant to the points that I will make below.

2.7.1 Position 1.

Groenendijk and Stokhof (1984) recognize the three readings in (90b-d), for a sentence like (90a). For them, the difference between a single or individual answer and PL-answer is a genuine scope ambiguity. The single answer arises when the *wh*-term takes scope above the universal quantifier, and the PL-reading arises when the universal quantifier takes scope above the *wh*-term. In the Montagovian tradition providing the theoretical framework for Groenendijk and Stokhof's theory, scope ambiguities are possible because the same surface representation can be reached through different derivational procedures differing from each other with respect to the time in which noun phrases are *quantified-in*. Recall that *quantifying-in* is the mechanism used in Montague Grammar to assign scope to noun phrases (see chapter1, footnote 3). In this approach, the PL-reading arises when the universal term is quantified-in into a structure containing a pronoun and where the wh-phrase has already been quantified in. In the particular case of (90), this means that one quantifies in *every man* into the structure *who does pro love?* and the result is a representation that can be paraphrased as in (91).

(91) For every man, who does he love?
For every man x, who does x love

This way of obtaining the PL-reading does not involve the use of functions. Groenendijk and Stokhof, however, use skolem functions for the representation of readings like (90d). This result is at odd with the intuition advanced in Engdahl (1980, 1986) that functional readings, like (90d), become PL-readings once we provide the extension of the function, since the extension of a function is, in fact, a set of ordered pairs. Groenendijk and Stokhof provide three arguments for their position.

The first argument is that the range of quantifiers that support functional readings is broader than the range of quantifiers that support PL-readings. Thus if one substitutes the quantifier in (90a) by any of the universal quantifiers in the left column in (92), the resulting sentence allow both a functional answer and a PL-reading, but if we use the quantifier on the right column instead, only the functional interpretation is preserved.

(92)

universal terms	non-universal terms
every man	no man
all men	any man
the man	few man
the men	many men
the two men	two men
both men	neither man
each man	a man
John	some man
John and Peter	most men
	at least one man
	at most one man
	exactly one man

(Groenendijk and Stokhof, 1984, p. 181)

From this distributional difference between functional readings and PL-interpretations Groenendijk and Stokhof conclude that the two readings should be distinguished. They argue that to prevent PL-interpretations for questions involving the quantifiers on the right column in (92), "we have to exclude their pair-list reading. But then, no reading is available to which the functional answers would correspond if the two were identified" (p. 191).

The second argument that G&S advance for their treating functional readings and PL-readings as unrelated interpretation is that when one embeds a question under *know*, it turns out that the resulting declarative sentence has different truth conditions depending on whether the embedded question is given a PL-reading or a functional interpretation. Consider the following.

(93) a. Sue knows which woman every man invited--namely his mother.
b. Sue knows which woman every man invited --she is making a list.

The sentences in (93a-b) have different truth conditions. The parenthetical continuation intends to bring out the functional interpretation and PL-reading respectively. (93a) is true in a situation in which Sue knows that what the men have in common is that they have invited their mothers as opposed to their wives or sisters. In this situation Sue does not need to know or be acquainted with the particular individuals in the extension of the mother-of function. By contrast, (93b) requires that the subject of the matrix clause knows for every man x, the particular individual y that x invited and that is in the extension of the predicate *woman*. Clearly in (93), the ambiguity must reside with the *wh*-complement since the matrix clause is identical in both examples. G&S argue that given the Fregean principle of compositionality, the two different meanings of the sentence in (93) should be obtained via different derivations, something that is warranted in their proposal.

G&S's third and last argument for separating the PL-readings from functional readings is that these interpretations seems to be associated with different *uniqueness* presuppositions. Consider again the embedded question in (93) in a matrix context.

(94) a. Which woman does every man love?
b. Mary
c. his mother
d. Bill, Sue; John, Mary; Tom, Betsy; ...

G&S notes that (94c) is felicitous as an answer to (94a) in a situation in which every man invited his mother even if some man or other invited another woman. By contrast, in the same context (94d) is not an appropriate answer to (94a). That is, the PL-interpretation of (94a) presupposes that every man is paired with a unique woman that he loves, and the presupposition needs to be rejected if some man is paired with more than one woman. The presupposition associated with the functional reading in (94c) is of a different sort. That reading only requires that there is a unique salient relation like the mother-of relation that relates every man to some other individual. Thus, the fact that some man loves two women in a given situation does not affect the uniqueness of the mother-of relation as long as what is constant among the men is that they love their mother as opposed to their sisters or friends etc.

I think that G&S have provided intriguing and interesting data that a theory of the relationship between functional and PL-readings needs to take into account. However, one is not compelled to their conclusion that PL-readings and Functional readings are unrelated. For instance, such a position fails to explain why the PL-interpretation always corresponds to some function that can be described intensionally.

In addition, their approach does not really provide and explanation of why the non universal quantifiers in the right column of (92) do not support PL-readings. To get that effect, they simply stipulate that such quantifiers are not affected by quantifying in. This is a surprising stipulation given that in Montague's style of quantifying in, assumed in G&S, such quantifiers needs to be quantified in at the last minute in sentences like (95) in order to obtain the wide scope for the existential. Nothing different should occur in a question since questions in G&S's approach are of the same semantic type as declaratives.

(95) Every man dated two women from my neighborhood. ($\forall > \exists$; $\exists > \forall$)

Recall that *quantifying-in* is the equivalent of the rule of QR (May 1977, 1985), the latter being the mechanism used for assigning scope to quantifiers in the principle and parameters approach (Chomsky 1981, 1986, Chomsky and Lasnik, 1989, among many

others). A theory of PL-readings based on QR (i.e. quantifying in) alone will not be able to handle contrasts like those in (96), as we have already seen.

(96) a. Which man loves every woman from my neighborhood? (SA, *PL)
c. Which man loves each woman from my neighborhood? (SA, PL)

In order to get this contrast based on quantifying in (QR) alone one will have to allow this procedure with *each* in (96b), but not with *every* in (96a). The problem here is that there is no non stipulative way to get the relevant contrast since quantifying in is supposed to be in effect for all universal terms in G&S's theory of PL-readings. In addition, as was the case with the major approaches to scope ambiguities in questions with quantifiers discussed in chapter 1, G&S miss the fact that syntactic reconstruction is necessary for PL-readings to be available. Consider the following examples repeated from section 2.

(97) a. **Which boy** strikes you as resembling **each man in your class**? (SA, PL)
b. **Which boy**$_k$ strikes **himself**$_k$ as resembling **each man** in your class? (SA, *PL)

(98) a. Which dancer seems to your mother to have danced with each candidate ?
(SA, PL)
b. Which dancer$_k$ seems to his$_k$ mother to have danced with each candidate ?
(SA, *PL)

G&S will have to assume that the embedded universal can be quantified in at the last minute in (97)-(98) in order to obtain the PL-interpretations of the a-sentences. However, quantifying in will incorrectly generate PL-readings for the b-sentences as well since the procedure is not contingent on the *wh*-phrase binding a variable in the matrix clause. We have seen that reconstruction in sentences like (97)-(98) is necessary for obtaining the PL-interpretations. I conclude therefore, that quantifying-in is the wrong way of deriving PL-readings. Once one abandon quantifying-in in order to accommodate the need for syntactic reconstruction in the distribution of PL-interpretations, the need of

using functions for representing PL-reading becomes imperative. This is because some part of the interrogative quantifier remains at the edge of the clause even if reconstruction takes place, given the meaning of interrogative operators.

If the *wh*-phrase at the edge of the clause is an existential quantifier over individual, and the universal quantifier is never introduced above the existential, as the preceding examples show, then the reading in which the values of the wh-phrase depends on the values of the universal quantifiers cannot be represented without the use of functions.[19] But once we use functions in order to represent PL-readings we should expect that such functions could be described extensionally or intensionally and so PL-readings and functional readings should not be unrelated contra G&S. I conclude therefore that the facts presented by G&S do not show that PL-readings and functional readings are unrelated, rather what the relevant facts show is that the domain of distribution of PL-readings is a subset of the domain of distribution of functional readings. That is, in a sense, the distribution of PL-readings is more restricted than the distribution of functional readings. A good theory of the relationship between these two readings should explain such a difference.

2.7.2 Position 2.

Engdahl (1986) and Chierchia (1991) advocate what I have called Position 2. In this view of the relationship between PL-readings and functional readings the two readings are instances of the same semantic representation involving skolem functions. The difference between the relevant interpretations is, from this standpoint, that the PL-reading provides the extension of the function in the actual world, whereas the functional reading is just the intension of the function. This view is attractive given that the extension of functions are in fact sets of ordered pairs, which is what PL-readings are semantically. The view also predicts correctly, that whenever a PL-interpretation is possible one should be able to find a functional reading equivalent since the representation generated to produce one of the readings, should in principle suffice for yielding the other. However, this position, if maintained needs to be somehow modified

[19] In fact, there is no way to even describe the meaning without using functions.

in order to account for the different distributions that PL- readings and functional readings sometimes show. Besides the fact that all the quantifiers in (92) support functional readings, but only a subset of them support PL-readings, the two readings behave different in some syntactic contexts. This can be seen clearly in the context of ATB extraction (Williams 1978). Consider the following question.

(99) a. Which picture of himself does every student hate and every professor like?
b. His MIT ID picture
c. *Jay, his wedding picture; John, his newspaper picture; ...

(100) a. Which woman does every local man respect and every foreign man detest?
b. his mother in law
c. *John, his wife; Jean Pierre, his mother in law; and Olaf, his girlfriend?

In (99)-(100), the functional answers, i.e. the b-answers, are fine to the questions involving ATB extraction from a conjunction. As it can be seen, the PL-reading is just impossible in this context. Here, the point made by Groenendijk and Stokhof (1984) is relevant. Somehow we need to block the representation that yields the PL-reading from arising in ATB contexts to account for the preceding data, but if the same representation is the only source for the functional reading as well, we will incorrectly predict that functional readings should not be found in ATB contexts either.

In section 2.7.4., I will maintain a variant of the view defended in Position 2, by arguing that the representation required to obtain PL-readings also yield functional readings, but that the latter interpretations can also arise through a different source. My defense of Position 2 will be helpful in solving a puzzle concerning the distribution of PL-readings in ATB contexts. I turn now to consider Position 3.

2.7.3 Position 3.

Position 3 is a package proposal attempting to incorporate features of both Position 1 and Position 2. Chierchia (1993), Dayal (1996), and Sharvit (1997) are the

main advocates of this position. This approach assumes with Engdahl (1986) that representations involving skolem functions underlie both PL-readings and functional interpretations. However, in order to obtain the PL-reading, this approach assumes that the universal quantifier undergoes absorption, in the sense of Higginbotham and May (1981), with the interrogative quantifier in COMP. Syntactically, absorption is very similar to quantifying-in. Thus, this approach inherits the same problem that G&S face. In particular there is no non-stipulative way to obtain the contrast in (96) in this approach, since one would have to assume that object *each* can absorb with a *wh*-phrase in COMP, but that the rule of absorption is not available for an object *every*. More importantly, this approach, like the one advocating Position 1, misses the fact that reconstruction of the *wh*-phrase is necessary for the availability of the PL-readings. As a result, in this view it is not possible to account for the contrast in (97) and (98), without the addition of considerable stipulations, given that absorption is not contingent on the *wh*-operator binding a pronoun within its c-command domain.[20] I will therefore conclude that an approach consistent with Position 3 does not provide an adequate treatment of the PL-reading and of the relationship of this reading with functional readings.

2.7.4 Functional Readings Have Two Sources.

In this section, I will attempt to solve a puzzle that I have considered for some time now concerning the distribution of PL-readings in ATB. I will argue that the solution to this puzzle requires assuming that an identity requirement prevents the generation of the representation that yields the PL-readings. As a result any functional reading arising out of the same representation will be excluded as well. But since functional readings are still possible under the relevant circumstances, I will conclude

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[20] That the higher operator binding a pronoun in its c-command domain does not block so called absorption is demonstrated by the fact that if one substitutes the embedded quantifier in (98b) for a wh-phrase to yield (i) below, the sentence receives a multiple question interpretation which is taken to be the result of absorption.

(vii) Which dancer$_k$ seems to his$_k$ mother to have danced with which candidate ? (SA, PL)

PL-readings in multiple questions are not the object of the present research.

that functional readings, beside arising out of the semantic representation that leads to PL-readings, also arise out of another alternative representation. To begin our discussion, recall that whereas PL-readings are bad in questions with quantifiers in the context of ATB extraction, functional readings are possible. Consider the examples in (101), which is of the same sort of (99)-(100), repeated below.

(99) a. Which picture of himself does every student hate and every professor like?
b. His MIT ID picture
c. *Jay, his wedding picture; John, his newspaper picture; ...

(100) a. Which woman does every local man like and every foreign man hate?
b. his mother in law
c. *John, his wife; Jean Pierre, his mother in law; and Olaf, his girlfriend?

(101) a. Which bear did every hunter shoot and John skin?
b. The grizzly (SA)
c. The one he has always been after (functional reading (FR))
d. *Bob, the grizzly; John, the polar bear; ... (PL)

Both the single answer interpretation and the functional reading are available in each of (99)-(101), but the PL-reading is missing in these sentences. The situation is slightly more complicated than what these examples lead us to believe, since the PL-reading becomes acceptable if one places a pronoun in the subject of the second conjunct that is co-indexed with the universal subject in the first conjunct:[21]

(102) a. Which bear did every hunter_k shoot and his_k son find?
b. The grizzly (SA)
c. The one he has always been after (FR)
d. Bob, the grizzly; John the polar bear; ... (PL)

[21] This point was brought to my attention by Kai von Fintel. I take advantage of the occasion to thank him individually.

Unlike the sentences in (99)-(101), (102) where a bound pronoun has been included in the subject of the second conjunct, allows a PL-reading straightforwardly. How can we explain this puzzle? In order to see what the problem is with (99)-(101), let us consider by way of example what the LF of (100) looks like. Recall that I am assuming the copy theory of movement. This means that there are identical copies of the *wh*-phrase in both conjuncts.

(103) a. [CP[Which woman] [[IP every l. man [vP which woman [v' like__]]] and
[IP every f. man [vP which woman [v' hate__]]]]]

b. [For which f] [[every l. man x like f_x(woman)] and
[every f. man y hate f_y(woman)]]

In (103b) the functional variable is bound from outside the conjunction. The implicit variable gets bound by a different universal quantifier in each conjunct. I hypothesize that the problem with the LF in (103), corresponding to sentence (100), is that it violates the *identity requirement* to which ATB movement from coordinate structures is subject (Williams, 1978).

The identity requirement states that the same element must be extracted from each conjunct. But in (103), if we interpret the copies of the interrogative determiner in the first conjunct as containing an implicit variable, and the one in the second conjunct as containing a different implicit variable, then the two copies are actually different and the identity requirement has been violated. I will assume that such a violation renders the representation ill-formed. (103) is therefore excluded, as a representation of (100), and the sentence is thus predicted to lack a PL-interpretation.[22] But there must be an

[22] Munn (1999) arrives at the opposite conclusion arguing that the distribution of PL-interpretations in ATB contexts violate the identity requirement. However, all his examples involve proper names somewhat surprisingly:

(viii) a. Where did Mary vacation and Bill decide to live?
b. Mary vacationed in Paris and Bill decided to live in Toronto.

alternative way of generating the functional reading that survives in that sentence without involving the representation in (103). I will come back to this question below.

That the absence of the PL-interpretation in (99)-(101) is related to a violation of the identity requirement is shown by the fact that (102) allows a PL-interpretation. Consider the LF of this sentence:

(104) a. [CP[Which bear] [[IP every hunter$_k$ [vP which bear [v' shoot__]]] and
[IP his$_k$ son [vP which bear [v' find__]]]]]

b. [For which f] [[every hunter x shoot f_x(bear)] and
[x's son find f_x(bear)]]

In (104), in order to respect the identity requirement we need to bind the implicit variable in the *wh*-determiner in both conjunct with the universal quantifier in the first conjunct as in (104b). We know that in this particular case the universal quantifier in the first conjunct can bind into the second conjunct because the pronoun *his* in the subject of the second conjunct can be understood as bound by that quantifier.[23] Since the identity

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As Fox (2000) shows sentences with quantifiers and proper names are scopally uninformative since the names do not interact with the quantifier. This can be clearly seen in the simple question *Where did Mary vacation?* Does this sentence has a PL-reading? If it does, that interpretation is indistinguishable from the single answer. Thus, a posibility, for instance, is that questions like (ii) are being analyzed for some reason as the conjuction of two questions, i.e., *Where did Mary vacation and where did Bill decide to live?* If so, what the speaker is doing in answering this question is providing two individual answers rather than a PL-interpretation in the standard sense. If Munn's examples were instances of genuine PL-readings, it would be mysterious why these readings are missing in (99)-(101) where we are using universal quantifiers rather than proper names. There is agreement that universal quantifiers like *every* and *each* are the principal supporters of PL-interpretations. To this respect, it is surprising that Munn uses universal quantifiers to illustrate how PL-readings arise in question, but shifts to proper names in arguing that they violate the identity requirement.

[23] A quantifier contained in one of the conjuncts of a coordinate structure usually does not have scope over other quantificational elements in the other conjunct, something regularly attributed to Ross's (1967) coordinate structure constrain. However, exceptional cases involving the binding of pronouns in the second conjunct have been well documented. Rodman (1976), and Ruys (1993) provide the examples in (iiia-b) respectively.

requirement is satisfied in this case, the structure in (104) is allowed and both the PL-reading and functional interpretation associated with this representation are predicted to be available.

Let us return now to the question of why a functional reading is still available for (100) despite the fact that the PL-reading is not available there. Recall that the problem with that sentence is that if we exclude the representation underlying the PL-interpretation, we are also excluding any other interpretation associated with that representation, including functional readings. Therefore, if a functional interpretation is available for (100) it must have arisen out of a representation other than the one in (103) which I am attributing to PL-interpretations.

If this line of thought is on the right track, one should be able to identify two different kinds of functional readings in ATB contexts. This is, in fact, what we find when we compare the functional reading of (100) with the one in (102). The functional reading in (100b) is *sloppy* in that the pronoun in the answer *his mother* is evaluated with respect to the binder in each conjunct. That is, the answer in (100b) can be considered a short answer obtained from a sentence like *every local man like his mother and every foreign man hates his mother.*

By contrast, the functional answer in (102) is *strict* in that here the pronoun is evaluated with respect to one binder only, namely the universal quantifier in the first conjunct. That is, (102c) as an answer to the question in (102a) can be considered an abbreviated form of *every hunter shot the bear that he has always been after and his son found it.* The equivalent of the sloppy functional reading would be *every hunter$_k$ shot the bear that he$_k$ has always been after and [his$_k$ son]$_j$ found the bear that he$_j$ has always been after.* In (100), where the PL-reading is impossible, the *strict* functional reading is

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(ix) a. A soldier found every student$_i$ and shot him$_i$
b. John kissed every girl$_i$ and bought her$_i$ a flower

(ixb), For instance contrasts with *John kissed every girl and bought a flower*, where the universal cannot take scope over the existential in the second conjunct. The appearance of the pronoun in the second conjunct in (ixb) seems to help the universal, somehow, to take scope over the second conjunct. It seems to me that these cases are instances of the phenomenon of *telescoping* (Roberts 1987, 1989; Poesio and Zuchi, 1992). See section 2.8 for more discussion on this.

also missing, whereas in (100), where the PL-reading is possible, the strict functional reading is the most prominent of the two functional readings[24]. This suggests that in the context of ATB movement, PL-readings are related to functional readings of the *strict* kind, but not to those of the *sloppy* kind.

I will conclude from these findings that although the representation underlying PL-readings also yield functional readings, the latter interpretations could also arise through an alternative representations. What should the relevant representation be? I will return to this question in Section 2.9., after addressing the question of how the universal in the first conjunct can bind into the second conjunct in questions like (102) involving ATB extraction.

2.8. Scoping Beyond the First Conjunct: Telescoping.

Let us address the question now of how the universal quantifier in the first conjunct of the ATB extraction context in (102), repeated below, can bind into the second conjunct.

(102) a. Which bear did every hunter$_k$ shoot and his$_k$ son find?
b. The grizzly (SA)
c. The one he has always been after (FR)
d. Bob, the grizzly; John the polar bear; ... (PL)

The question is by what mechanism the quantifier can bind the pronoun in this context. In answering this question one should investigate whether there are other environments in which a quantifier seem to scope outside its syntactic domain, and see whether such environments share the properties found in coordinate structure like one above. There is in fact a phenomenon that displays the properties of long-distance-scoping as it shows in (102), namely the phenomenon known as *telescoping* (Roberts 1987, 1989; Poesio and Zuchi 1992). An example of telescoping is given in (106)[25].

[24] I am not sure of whether the *sloppy* functional reading is missing here.

(106) Every story$_k$ pleases these children. If it$_k$ is about animals, they are excited, if it$_k$ is about witches, they are enchanted, and if it$_k$ is about humans, they never want me to stop. (Poesio and Zucchi 1992, from Belvadi 1989)

The universal quantifier in the first sentence in (106) appears to be able to bind pronouns in the subsequent sentences in that piece of discourse. Obviously, this is not normally the case, as the unacceptability of (107) demonstrates.

(107) *Every man$_k$ came in. He$_k$ whistled.

(Groenendijk and Stokhof 1990)

The pronoun in the second sentence of the small discourse fragment in (107) cannot be anaphorically related to the pronoun in the second sentence. Researchers (e.g. Heim 1982) have usually taken cases like (107) as the representative cases, considering situations like the one in (106) as the exceptional case. The exact conditions that makes telescoping possible are not well understood at the present. There seems to be agreement in the literature that several pragmatic factors of the sort discussed in Poesio and Zucchi (1992), and Dekker (1993) seem to make telescoping possible. I observe that a sufficient condition for making telescoping possible seems to be the one described in (108).

(108) **Sufficient Condition for Telescoping of Universal Quantifiers.**
Telescoping of a universal quantifier α into a domain D is possible if D contains and expression that is anaphorically related to an (in)definite expression in the scope of α.

To show that telescoping is possible when the condition in (108) is met consider the following minimal pairs modeled after the example in (107).

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[25] The phenomenon of telescoping is very obscure to me at this stage, and so the content of this section should only be considered speculative.

(109) a. *Every man$_k$ sang. He$_k$ whistled

b. Every man$_k$ sang a song$_j$. He$_k$ whistled it$_j$ (too).

(110) a. *Every man$_k$ failed to sing. He$_k$ whistled (instead).

b. Every man$_k$ failed to sing [a song(he was required to sing)]$_j$.

He$_k$ whistled it$_j$ (instead)

(112) a. *Every man$_k$ arrived. He$_k$ marked the place.

b. Every man$_k$ arrived at [a place with treasures]$_j$. He$_k$ marked it$_j$ to return later.

In the a-examples in (109)-(112) the pronoun in the second sentence cannot be anaphorically related to the universal quantifier in the first sentence. However, in the b-sentences the pronoun *he* can be related to the quantifier in the relevant sense. The only difference between the members of each pair of discourse fragments, is that in the b-examples an indefinite appears in the immediate scope of the universal quantifier, and is in an anaphoric relation with a pronoun in the second sentence. In a sense the indefinite is used first in the scope of the universal, and then is "recycled" in the second conjunct through the use of an anaphoric pronoun. The condition in (108) is thus met in the b-examples in (109)-(112), and this is sufficient for the universal to bind into the second sentence as the acceptability of the sentences show.

Notice the use of the parenthesis with the term (in)definite in (108), since the set of expressions that seems to "extend" the scope of a universal quantifier are both the definite and indefinite NPs. This being the case, the original telescoping example in (106) also meet the condition in (108). In that example, the definite expression *these children* is in the scope of the universal quantifier, as is related to the pronoun they in each sentence of the subsequent discourse. That is enough for making telescoping possible in that example.

What is the relationship of telescoping with the ATB -movement example in (103)? Evidently, in that example there is a copy of the *wh*-phrase in the scope of the universal quantifier, and an identical copy appears in the second conjunct as well given the identity requirement. This can be clearly seen in the LF in (104a) repeated below.

(104) a. [CP[Which bear] [[IP every hunter$_k$ [vP which bear [v' shoot__]]] and
[IP his$_k$ son [vP which bear [v' find__]]]]]

Since wh-phrases are indefinite, the LF in (104a) meet the condition in (108) via the lower copies. Those copies however are only available through reconstruction. This means that in ATB contexts involving questions with universal quantifiers like (102), reconstruction has the effect of creating a telescoping environment by placing an indefinite in the scope of the universal, and using it also in the second conjunct. That is, by meeting the condition in (108).

The telescoping condition is also met in other cases of apparent exceptional binding in coordinate structures involving coordination at the VP level. These cases follow the pattern of the examples reported before. Consider the minimal pair in (113) reported in Ruys (1992), and the example in (114) from Roman (1976).

(113) a. John [kissed every girl] and [bought a flower]
b. John kissed every girl and [bought her a flower]

(114) a soldier found every student$_i$ and shot him$_i$

Ruys notices that the example in (113a) does not have a reading in which the value for the indefinite *a flower* in the second conjunct varies with the girls. This reading can be roughly paraphrased as in (115).

(115) [every girl y [a flower z [[John kissed y] & [John bought z]]]].

In other words, the universal quantifier does not take scope over the existential quantifier in the second conjunct of (113a). By contrast, however, (113b) does have the reading in which the universal have scope over the existential. Here's what Ruys says with respect to the contrast in (113):

> In the latter example (i.e. (113b) CAB), *every girl* can take scope over *a flower*, as well as binding the pronoun *her* as a variable, in apparent violation of the CSC. It would appear that a quantified NP object can take scope over a coordinated VP, if the coordinated VP contains a pronoun coindexed with the quantified NP.
>
> (Ruys 1992, p. 36)

As the previous paragraph reveals, for Ruys the fact the universal quantifier can take scope over the existential in (113b) is the result of the quantifier been able to bind a variable in the second conjunct. That is, for Ruys, the characterization of the exceptional behavior of examples like (113) is very different from what is stated in the condition in (118). In Ruys's view, what is important is that there is a pronoun in the second conjunct for the quantifier to bind. In binding the pronoun, the quantifier is allowed, in Ruys's view, to scope over the second conjunct. According to the condition in (108), on the other hand, what is important in the relevant cases is that an (in)definite, that occurs inside the scope of the universal, is "revived", anaphorically, in the second conjunct. That is, under the condition in (108) the *telescope* of a universal is parasitic on the telescope of an existential lying in the scope of the universal. Let us compare the predictions of both views.

If the telescoping view of examples like (113) is right, there must be some (in)definite expression in the scope of the universal that is re-used in the second conjunct, after reconstruction takes place, for the universal to be able to bind into the second conjunct. Consider the structure LF of (113b) assuming reconstruction of the subject and coordination at the small vP level.

(116) [[vP every girl$_k$ [vP **John** kissed t_k]] and [vP a flower$_j$ [vP **John** gave her$_k$]]]

In (116), the bald-faced definite NP *John* occurs both in the scope of the universal quantifier in the first conjunct, and in the second conjunct as well. This is enough to meet the condition in (108), and the universal can thus telescope to bind a variable in the second conjunct. Now, to show that the cases in (113) and the question in (103) really constitute cases of telescoping one must identify a situation in which telescoping does not

obtain and show that in such conditions binding of the quantifier from the first conjunct into the second conjunct of a coordinate structure is not possible either. A situation in which telescoping does not obtain is one in which the condition in (108) is violated by allowing an indefinite in the scope of the universal in the first domain, but not in the domain where the quantifier is expected to telescope. Binding into the second conjunct of a coordinate structure is also problematic in such cases consider the following:

(117) a. *Every man$_k$ sang a song. He$_k$ went to the supermarket.

b. *Every man$_k$ failed to sing [a song (he was required to sing)].
He$_k$ went out with Mary.

c. *Every man$_k$ arrived at [a place with treasures]. He$_k$ is from a small town.

According to most of the informants I consulted with respect (117), these sentences are not as acceptable as the b-examples in (109)-(112), but seem to be more like the bad a-examples. The crucial difference between these examples and the b-examples in (109)-(112) is that there are no pronouns in this case in the second sentence referring to the indefinite NP in the scope of the universal in the same sentence. That is, the sentences in (117) do not meet the condition in (108). This situation can be reproduced for coordinate structures like in the case of (113b). Examining the LF in (116) it is obvious what we need to do if we don't want to meet the condition in (108): replace *John* in the second conjunct by some other NP. The binding of the pronoun should then be affected as it was affected in (117). This prediction is in fact borne out:

(118) a. John kissed every girl$_k$ and the teacher bought her$_k$ a flower.

b. A soldier found every student$_k$ and a woman shot him$_k$

In (118) the binding of the pronoun in the second conjunct becomes as difficult as the binding of the pronoun in (117). Why should changing the subject of the second vP have an effect on the scope taking properties of the universal on the first conjunct? The condition in (108) provides an answer to this question: changing the subject destroys the condition for telescoping to take place.

Let us see now how Ruys deals with the contrast between (113b), on the one hand, and (118), on the other. His account of the exceptional (113b) is that the universal quantifier can scope out of the coordinate structure without violating the CSC because the pronoun coindexed with the universal quantifier in the second conjunct is a resumptive pronoun.[26] However, if the pronoun helps the quantifier to scope out of the coordinate structure in (113b), resulting in an acceptable binding relation, it should also have a similar effect in the examples in (118), contrary to fact. I therefore conclude contra Ruys that cases like (113b), which are parallel to the question in (103), are in fact a case of telescoping rather than a case of legitimate variable binding under c-command.

An advantage of treating the possibility of PL-readings in questions with quantifiers in ATB contexts, when a pronoun appears in the second conjunct, as a case of telescoping is that telescoping does not seem possible into the domain of another quantifier even if the condition in (108) is met. I called such domains opaque. They are exemplified in the following paradigm:

(119) a. *Every man$_k$ sang a song$_j$. Every woman told him$_k$ to record it$_j$.

b. *Nobody told him$_k$ to record it$_j$.

c. *a woman told him$_k$ to record it$_j$.

d. *Few people told him$_k$ to record it$_j$.

The quantifier in the first sentence of (119) cannot felicitously bind a variable inside the scope of another quantifier in the second sentence, despite the fact that the condition in (108) is met; that is, despite the fact that an indefinite appears inside the scope of the universal in the first sentence and a pronoun, anaphorically related to the indefinite, appears in the second sentence. What seems to be going on here is that the second quantifier is creating an opaque domain for binding of the variable by the first quantifier. This type of opacity is not typical of syntactic variable binding under c-command,

[26] The rationale behind this idea is that dependencies involving resumptive pronouns are known to violate others island constraints. Ruys provides the sentence *Here is the man who$_i$ I don't believe the claim that Peter saw him$_i$* as a violation of the Complex Noun Phrase Constraint (CNPC).

(120) a. Every man told [every woman that he was crazy]
b. [nobody that he was crazy]
c. [a woman that he was crazy]
d. [few people that he was crazy]

This in itself suggests that variable binding under telescoping seems to be different from syntactic variable binding under c-command. Notice now, that the absence of the PL-reading in examples like (100) repeated below is entirely parallel to the absence of variable binding in (119).

(100) a. Which woman does every local man like and every foreign man hate?
b. his mother in law
c. *John, his wife; Jean Pierre, his mother in law; and Olaf, his girlfriend?

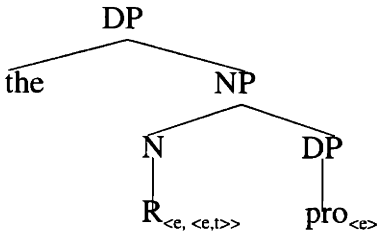
Reconstruction of the *wh*-phrase in both conjuncts in (100) creates an environment that satisfies the condition in (108) since an indefinite (i.e. the *wh*-phrase) will appear in the scope of the universal in the first conjunct, and will appear again in the second conjunct. However, the universal quantifier in the subject position of the second conjunct creates an opaque domain for the binding of the implicit variable of the *wh*-copy by the quantifier in the first conjunct just like the quantifiers in the second sentences in (119) prevent binding of the pronoun by the quantifier in the first sentence. Given the parallelism between binding across conjuncts in coordinate structures and cross sentential binding, witnessed in this section, I conclude that the two phenomena should be treated in the same way: in terms of telescoping.

I believe that the most plausible accounts of telescoping involve the positing of accommodation (local or global) of material from the first conjunct into the second. I will not provide details here on how this is exactly done. Instead, I refer the reader to Poesio and Zucchi (1992) for a plausible implementation.

2.9. The other Source of Functional Readings.

In section 2.7.4., I concluded that the representation that underlie PL-readings, also yields functional readings, but that the latter type of interpretations can also arise from an alternative representation. What should the postulated alternative representation look like? I suggest that the alternative functional readings involve analyzing the wh-traces in terms of Cooper's (1979) analysis of E-type pronouns. Cooper proposes that the representation of an E-type pronoun at LF consists of a definite article and two variables: a variable over two-place relations (type <e, <e,t>>) and a variable over individual (type e.) The relevant representation can be sketched as in (121), from Heim and Kratzer (1998)

(121)



In Cooper's analysis, the variable *R* remains free an is interpreted as picking up some contextually salient relation (e.g., the mother-of relation) in the utterance context. The pronominal element *pro*, on the other hand, is bound by a quantifier in argument position. If we assume that *wh*-traces can optionally be interpreted as in (121), we can bind the *R* variable with the *wh*-phrase from the COMP position and the pronominal element *pro* with some c-commanding NP in argument position.

I will assume that the restriction of the wh-phase in the COMP position is interpreted in the standard sense, i.e., as predicate of individuals. However, I suggest that the wh-determiner gets interpreted in a manner different from the standard way. In particular, I suggest that the wh-determiner in this case applies to a property of individuals and returns an interrogative generalized quantifier over two place relations provided that the elements in the range of the relation satisfy the property restricting the determiner, this is illustrated in (122a), where I provide the lexical entry I am assuming for *which*. To see how the analysis works, consider example (94), repeated below as (122b), and its LF in (122c).

(122) a. $[\![\text{which}]\!] = \lambda Q_{<e,t>}.\lambda F_{<<e,<et>>,<st,t>>}.\lambda p_{<st>}\ \exists R_{<e,et>}[\forall y[y \in \text{Rang}(R) \rightarrow Q(y)] \wedge F(R)(p)]$

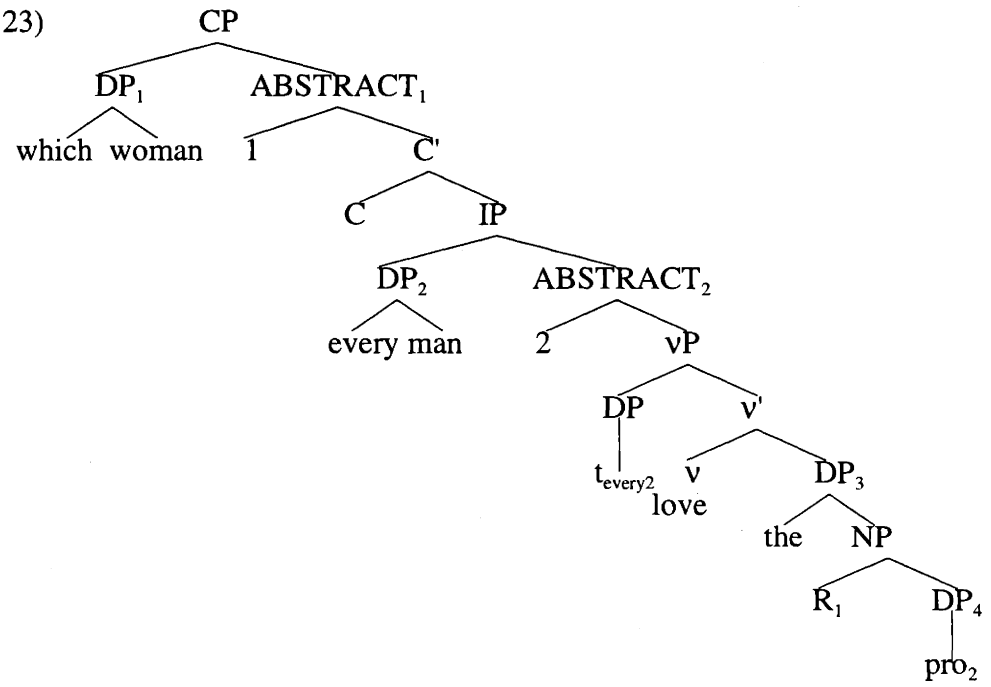
b. Which woman does every man love?

c. [CP [Which woman]$_j$ does [IP every man$_k$ [νP $t_{\sout{which}}$ [νP t_{every} love [DP the [NP R_j [DP pro_k]]]]]]]

d. Which $R_{<e,<e,t>>}$, whose values are sets of women, is such that every man x loves the individual obtained by applying *the* to the predicate resulting from applying R to x ?

I assume that the intermediate copy of the *which*-phrase in the outer spec of νP in the LF in (122c) is simply deleted. The end result of the semantic composition taking place in that LF can be roughly paraphrased as in (122d). Clearly this question is explicitly about a salient relation and not any individual in particular. Answers to this question will involve value assignments to the relation variable, such as the mother-of relation, the sister-of relation etc., whatever happens to be true. Consider now the transparent LF (TLF) version of (122c).

(123)



In the TLF in (123), the variable R is type <e, <e,t>>, which I will henceforth abbreviate as the type τ_{2R}. This variable is lambda abstracted in COMP by the lambda abstract created via *wh*-movement. The pronominal pro (type <e>) is lambda abstracted over at the IP level by the abstract created by movement of the universal quantifier to the specifier of IP. The restriction of the *wh*-phrase is interpreted in the standard way (i.e., of type <e,t>).

Given the Karttunen semantics for questions that I have assumed in this dissertation, the node C' denotes a question, i.e., a set of propositions (type $<\tau_q>$). $ABSTRACT_1$ must then denote a function from two place relations into questions denotations. That is, the type of ABSTRACT1 is $<\tau_{2R}, \tau_q>$. The *wh*-phrase is of type $<<\tau_{2R}, \tau_q>, \tau_q>$, i.e. it denotes an interrogative generalized quantifier over two place relations. Following compositionality, this means that the interrogative determiner *which* must be a function from sets of individuals into interrogative generalized quantifiers (type $<<e,t>, <<\tau_{2R}, \tau_q>, \tau_q>>$. A more detailed analysis of the semantic composition in (123) is given below.

(124) a. $[\![NP]\!] = \pi(z)$ Function Application (FA).

b. $[\![DP_3]\!] = \lambda h_{<e,t>}.\ \iota u\ [h(u)]\ (\pi(z))$ FA.

$= \iota u\ [\pi(z)(u)]$ Lambda Conversion (LC).

c. $[\![vP]\!] = love'\ (z, \iota u\ [\pi(z)(u)])$ FA, LC

d. $[\![ABSTRACT_2]\!] = \lambda z\ [love'\ (z, \iota u\ [\pi(z)(u)])]$ Lambda Abstraction (LA).

e. $[\![DP_2]\!] = \lambda P \forall x[man(x) \rightarrow P(x)]$ Generalized Quantifier meaning

f. $[\![IP]\!] = \lambda P \forall x[man(x) \rightarrow P(x)]\ (\lambda z\ [love'\ (z, \iota u\ [\pi(z)(u)])])$ FA

$= \forall x[man(x) \rightarrow love'\ (x, \iota u\ [\pi(x)(u)])]$ LC twice

g. $[\![C]\!]\ \lambda q_{<s,t>}.\ \lambda r_{<s,t>}\ [true'(r) \wedge r = q]$ Lexical meaning of IC[27]

h. $[\![C']\!] = \lambda q_{<s,t>}.\ \lambda r_{<s,t>}\ [true'(r) \wedge r = q]\ (\forall x[man(x) \rightarrow love'\ (x, \iota u\ [\pi(x)(u)])])$ FA

[27] IC = interrogative complementizer.

$= \lambda r_{<s,t>}$ [true'(r) $\wedge$ r = $\forall$x[man(x) $\rightarrow$ love' (x, ιu [R(x)(u)])]]

LC

i. [[ABSTRACT$_1$]] = $\lambda\pi_{<\tau_{2R}>}$. $\lambda r_{<s,t>}$ [true'(r) $\wedge$ r = $\forall$x[man(x) $\rightarrow$ love' (x, ιu [π(x)(u)])]] LA over the relation variable.

j. [[woman]] = $\lambda v_{<e>}$ [woman(v)] Lexical meaning of *woman*

k. [[which]] = $\lambda Q_{<e,t>}.\lambda F_{<\tau_{2R}, \tau_q>}.\lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$[$\forall$y[y $\in$ Rang(R) $\rightarrow$ Q(y)] $\wedge$ F(R)(p)] Lexical meaning of *which*

l. [[DP$_1$]] = $\lambda F_{<\tau_{2R}, \tau_q>}.\lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$[$\forall$y[y $\in$ Rang(R) $\rightarrow$ $\lambda v_{<e>}$ [woman(v)](y)] $\wedge$ F(R)(p)] FA, LC

$= \lambda F_{<\tau_{2R}, \tau_q>}.\lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$[$\forall$y[y $\in$ Rang(R) $\rightarrow$woman(y)] $\wedge$ F(R)(p)]

LC

m. [[CP]] = $\lambda F_{<\tau_{2R}, \tau_q>}.\lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$ [$\forall$y[y $\in$ Rang(R) $\rightarrow$woman(y)] $\wedge$ F(R)(p)]($\lambda\pi_{<\tau_{2R}>}$. $\lambda r_{<s,t>}$ [true'(r) $\wedge$ r = $\forall$x[man(x) $\rightarrow$ love' (x, ιu [π(x)(u)])]]) FA

$= \lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$ [$\forall$y[y $\in$ Rang(R) $\rightarrow$woman(y)] $\wedge$ $\lambda\pi_{<\tau_{2R}>}$. $\lambda r_{<s,t>}$ [true'(r) $\wedge$ r = $\forall$x[man(x) $\rightarrow$ love' (x, ιu [π(x)(u)])]](R)(p)] LC

$= \lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$ [$\forall$y[y $\in$ Rang(R) $\rightarrow$woman(y)] $\wedge$ $\lambda\pi_{<\tau_{2R}>}$. $\lambda r_{<s,t>}$ [true'(r) $\wedge$ r = $\forall$x[man(x) $\rightarrow$ love' (x, ιu[R(x)(u)])]](p)] LC

$= \lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$ [$\forall$y[y $\in$ Rang(R) $\rightarrow$woman(y)] $\wedge$ true'(p) $\wedge$ p = $\forall$x[man(x) $\rightarrow$ love' (x, ιu[R(x)(u)])]]

As it can be seen from the computation in (124), the compositional meaning that we derive for the question *which woman does every man love?* in (122) is the formula given in (125).

(125) $\lambda p_{<st>}$ $\exists R_{<\tau_{2R}>}$ [$\forall$y[y $\in$ Rang(R) $\rightarrow$woman(y)] $\wedge$ true'(p) $\wedge$ p = $\forall$x[man(x) $\rightarrow$ love' (x, ιu[R(x)(u)])]]

This formula is the characteristic function of the set of propositions denoted by that question. Notice that here, in order to judge the truth of the propositions that will be included in the set denoted by the question we need to do value assignments to the

relation variable. The assignments are restricted to functions from individuals to set of individuals so that the members in the range of the function are in the extension of the set denoted by the predicate *woman*. This will generally hold for female relational predicates like *sister-of*, *mother-of*, etc, when applied to human arguments, but not to predicates like *father-of*, or *brother-of*.

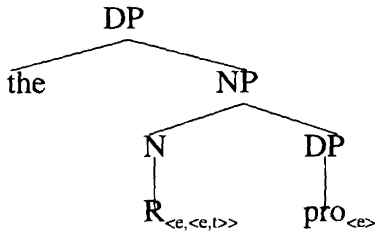
A question that arises now, and which I will leave open for future research to settle, is how to prevent a functional representation like the one in (125) from yielding a PL-interpretation by providing the extension of the relation. We need to somehow block the PL-readings or otherwise we will be back to ground zero predicting the two readings to have exactly the same distribution. I hope that future research will reveal techniques that will allow us to prevent the PL-interpretations in such cases. What matters for the purpose of this dissertation is that PL-readings are distinct from functional readings. For the rest of this dissertation I will only discuss PL-interpretations.

Before closing this section, let us clarify some points about how our representation of *wh*-traces in terms of Cooper's analysis of E-type pronouns arises in the grammar. I will assume that unpronounced copies of moved *wh*-phrases are not impoverished structures interpreted as individual variable as it is usually assumed in the literature. Rather I will assume that there are alternative methods of interpreting reconstructed copies. Besides using choice functions, I will assume that copies can also in principle be interpreted as descriptions along the lines suggested in Beck and Rullman (1997), for *which*-phrases. Fox (2001) extends this idea to cover the traces of quantificational NPs in general including *wh*-phrases. Fox proposes a mechanism of *trace-conversion* that transforms a given copy of a raised operator by replacing the determiner for the definite article, an introducing an individual variable in predicative position. This mechanism is illustrated in (126) for the lower copy of the *which*-phrase.

(126)	Input	[Which dog did Mary see [which dog]]
	Replace determiner	[Which dog did Mary see [the dog]]
	Insert variable	[Which dog did Mary see [the dog x]]
	Interpreted as	[Which dog x : Mary see the dog identical to x]

I propose that the structure in (121), repeated below, also arises through trace conversion with the difference that in this case the restriction is replaced by a relation variable R of type <e, <e,t>> and an individual variable is inserted as the argument of the relation variable.

(121)



The structure is interpreted as already discussed above. Notice that in (121) the pronominal variable and the relation variable are not a part of the same lexical item as is the case of the original *wh*-determiner that contains an implicit variable and is itself translated as a choice function variable as proposed in section 2.4.. This means that in an ATB context. We can take the R variable to satisfy the identity requirement of extraction, since it is bound from the COMP position, without having to take also the pronominal in argument position of the variable as they are independent lexical items. This means that the pronominal element in (121) can be bound by a different binder in both conjuncts of a coordinate structure without incurring into a violation of the identity requirement which is satisfied by the R variable.

In the case of PL-readings, the *wh*-determiner must count as the same element in both conjunct, and this is only possible if that given lexical item contains the same implicit variable in both conjuncts of a coordinate structure. But to count as the same implicit variable, a variable must be bound by the same binder in a coordinate structure. This analysis, thus, captures the fact that whereas PL-readings are impossible in ATB contexts, functional readings occur in exactly this environment with no problems at all.

2.10. Summary and Conclusion.

In this chapter we have seen that PL-readings of questions with universal quantifiers require reconstruction on the part of the *wh*-phrase below the quantifier in the sentence. In the first part of the chapter we considered the interaction of PL-

interpretations with BT(A) (Section 1.1), and with BT(C) (Section 1.2). It was shown that when a *wh*-phrase is trapped in the COMP position because its reconstruction would result in violations of binding principles, the PL-interpretation is not available. The same conclusion was reinforced in section 1.3., where we showed that blocking reconstruction in a matrix question with quantifier involving a raising construction, and in which the quantifier is in the embedded clause, kills the PL-reading. In the second part of the chapter, we saw that by using skolemized choice-functions, we are able to develop an adequate semantics for the relevant interpretation.

The reconstruction data examined in the first part of the chapter lead me to conclude that quantifying in is not an adequate mechanism for capturing the intricacies of *wh*-quantifier interactions. The problem here is that once the need for syntactic reconstruction is recognized, there is no way to even describe the PL-reading in the semantics (never mind representing it), without the use of functions. At the end of this chapter we also saw that PL-readings may have a different grammar altogether from functional readings. We saw with the data involving ATB extraction that although PL-readings are related to functional readings. Functional readings can, in fact, originate through alternative semantic representations, which make it difficult to determine the exact distribution of the latter type of readings. This being the case, I will only concentrate in the chapters to come in study the possible gains of a theory that treats PL-readings in terms of reconstruction, without any mention to functional readings.

Since PL-readings require reconstruction, and since reconstruction depends on the interpretations of lower copies, at least under a particular interpretation of the phenomenon, in the reconstruction view of PL-readings these interpretations become a diagnostic for successive cyclicity. This opens up a new agenda in the study of questions with quantifiers that I will begin to consider in the next chapter by using PL-readings as a diagnostic for cyclicity in *wh*-movement cross-linguistically.

CHAPTER III: CYCLICITY AND PL-READINGS IN *WH*-QUANTIFIERS INTERACTION.

0. Introduction.

In the previous chapter, I provided evidence showing that in questions with quantifiers, PL-readings or the so-called narrow scope interpretation of the *wh*-phrase arises through syntactic reconstruction of the *wh*-phrase below the quantifier in the question.

Under the copy theory of movement, reconstruction arises through the interpretation of intermediate copies, intermediate in the sense that they are located in the intermediate positions targeted by *wh*-movement on its way to its final landing site. Under this particular view of reconstruction, and under the reconstruction view of PL-readings, an interesting prediction emerges: one should be able to identify the posited intermediate landing sites by simply placing a universal quantifier above the relevant site. If a PL-reading is possible one must conclude that the given postulated position is in fact there and must have been targeted by movement, if no PL-interpretation is available one should conclude that the relevant position has not been targeted by movement. In other words, if reconstruction is necessary for the availability of PL-readings, such readings should, at least, come close to a reliable diagnostic for successive cyclicity.

The possibility of using PL-readings as a diagnostic for cyclicity is not open in previous approaches to *wh*-quantifier interaction in which the need for the reconstruction of the *wh*-phrase is not recognized. In this chapter I will first discuss evidence showing that PL-readings can in fact diagnose whether a particular instance of wh-movement has been successive cyclic or not, an issue that has figured at the center of syntactic research since the late seventies and early eighties (see, for instance, Chomsky 1977, 1981, 1982). Then, I will use the (un)availability of PL-interpretations in order to determine whether wh-phrases in constructions where displacement is not obvious (e.g., wh in situ) get their scope via successive cyclic movement.

1. Pair-List Readings as a Diagnostic for Successive Cyclicity (SC).

Let us put the idea that PL-readings can help us diagnose SC to use by considering the following minimal pair from May (1985).

(1) a. Who do you think everyone saw at the rally? (*SA, PL*)
b. Who thinks everyone saw you at the rally? (*SA, *PL*)

The sentence in (1a) is ambiguous allowing either a single individual reading or a PL-answer. (1b) on the other hand is unambiguous allowing only the single individual interpretation of the question. The reconstruction view of PL-readings predicts that only if the *wh*-phrase has occupied a landing site below the quantifier on its way to COMP will the sentence allow a PL-interpretation. Therefore, such reconstruction site(s) must be available in (1a), which is ambiguous, but not in (1b), which is not. Theta theory allow us to check that this prediction independently. In (1a), the *wh*-phrase must have been merged in the embedded clause as it bears the theta role of the embedded verb *see*. In (1b), on the other hand, the *wh*-phrase is only introduced into the derivation in the matrix clause for theta-theoretic reasons as well.

So, the availability of PL-interpretations have successfully identified the existence of positions below the quantifier in (1a), positions that are independently identified, but not in (1b). Notice now that the opposite situation is also expected if the reconstruction view is right. That is, when positions are independently identified, we should be able to obtain PL-interpretations by simply placing a universal quantifier above the relevant position. That this is in fact the case is shown by multi-clausal examples like those in (2), where the *wh*-phrase bears the role of the embedded verbs, reconstruction is not blocked, and we have placed a universal quantifier in the matrix clause c-commanding the theta position:

(2) a. Who does every witness think you saw at the rally? (*SA, PL*)
b. Who did every witness say saw you at the rally? (*SA, PL*)
c. Who did every witness say you saw Mary kiss? (*SA, PL*)

d. Which victim did every detective see several pictures of? (*SA, PL*)

e. Which victim did each detective find five pictures of? (*SA, PL*)

This is because there are positions available below the matrix quantifiers where the *wh*-phrase can be reconstructed. This fact is tacitly recognized in the general assumption underlying most approaches to *wh*-quantifier interaction including those discussed in chapter 1 in the sense that nesting licenses PL-interpretations, although as we saw in chapter 2, it is not a sufficient condition.

Sentences like (1a), and (2), however, do not tell us how cyclic a particular instance of movement has been. They only tell us that there is at least one reconstruction site below the quantifier where the *wh*-phrase has been prior to being moved to the COMP position. For all we know, however, the relevant reconstruction site could be the theta-position itself. So even if the *wh*-phrase moves to the matrix clause in a single swoop, instantiating so-called *long-movement*, in sentences like (1a), and (2), we should be able to get a PL-reading by using the theta position. This means that in sentences like (1a), and (2), PL-readings can diagnose successive cyclicity only if we show that there are other positions beside the theta position below the universal quantifier, and that such interpretations can obtain when the theta position is not available for reconstruction. In the next section I will argue based on data by Fox (2000), that the outer Spec of the vP provides an intermediate landing site for *wh*-movement.

1.1. The vP as an Intermediate Landing Site.

As concluded in the section that precedes, in a question with quantifiers where the wh-phrase has been extracted from the c-command domain of the quantifier, we can use the availability of the PL-interpretations as a diagnostic for successive cyclicity only if we show that the base position is not available for reconstruction. Fox (2000), based on data by Lebeaux (1990), has elaborated examples that show exactly that. Consider Fox's example below.

(3) a. [Which (of the) paper(s) that he_1 wrote for Ms. $Brown_2$]

did every student$_1$ [_____] get her$_2$ [to grade__*__]?

b. [Which (of the) paper(s) that he$_1$ wrote for Ms. Brown$_2$]

did every student$_1$ [_____] ask her$_2$ [to read__*__]?

The point of the examples in (3) is that the *wh*-phrase must be reconstructed to a position below the quantifier so that the pronoun *he* in the restriction of the fronted *wh*-phrase can be bound by the quantifier. However, the *wh*-phrase cannot be reconstructed too low as to the position marked with the asterisk in the sentences in (3), as that would place the r-expression *Ms. Brown* within the c-command domain of the pronoun *her* in violation of binding condition C (BT(C)). The desired effect is obtained if there is a position below the subject of the clause, but above the VP, as in the position indicated by square brackets and underscore immediately below the matrix subject in (3).

I will assume following Chomsky (2000, 2001) that reconstruction sites are phases. The two relevant phases in Chomsky sense are vP and CP. The only phase below the subject position of the clause and above the VP is the vP phrase. I will therefore assume that the position identified by Fox and Lebeaux in examples like (3) corresponds to the outer Spec of the vP phrase.

Notice now that Fox's example in (3) allow PL-interpretations. In fact the PL-interpretation seem to be the only possible interpretation for such questions given the fact that variable binding of the pronoun is obligatory for the sentence to be well-formed. This is expected under the reconstruction view of PL-readings. Both variable binding and PL-readings require reconstruction of the *wh*-phrase to a position below the quantifier in (3). BT(C), on the other hand, requires that reconstruction takes place above the VP.

The conclusion from the interaction of variable binding and PL-readings with BT(C) in examples like (3) is that there must be a position mediating between the VP and the Subject position. Notice that the same conclusion could be reached by examining the interaction of BT(C) and PL-readings alone without taking overt variable binding into consideration. This is because PL-readings are a special kind of variable binding as well in which the relevant universal quantifier binds an implicit variable in one of the copies of the *wh*-determiner. Consider the following examples which are variations of Fox's examples.

(4) a. *[Which of the books that he_1 asked Ms. $Brown_2$ for]
did she_2 _*_ give every $student_1$ _*_ ?

b. [Which of the books that he_4 asked Ms. $Brown_2$ for]
did she_2 _*_ give every $student_1$ _*_ ? *(SA, *PL)*

c. [Which of the books that John asked Ms. $Brown_2$ for]
did she_2 _*_ give every $student_1$ _*_ ? *(SA, *PL)*

d. [Which of the books that John asked her_2 for]
did $Brown_2$ _*_ give every $student_1$ ___ ? *(SA, PL)*

Fox's example in (4a) is unacceptable which is understandable given that the pronoun cannot get under the scope of its antecedent, the quantifier phrase *every student*, as that option is blocked by BT(C). If the pronoun is interpreted deitically as in (4b), the sentence is acceptable. Similarly, (4c-d) where there is no overt relation between pronouns in the fronted wh-phrase and the quantifier, are also acceptable.

However, one can group the acceptable sentences in (4b-d) into two groups with respect to whether they allow a PL-answer or not. None of the informants I consulted found that (4b-c) can be given a PL-answer. Many of the same informants, however, found that (4d) seems to allow a PL-interpretation. This contrast is as expected by the reconstruction view of PL-readings. In (4c), for instance, the fronted wh-phrase contain the r-expression Ms. Brown which is coindexed with the pronoun *she* in subject position. BT(C) prevents reconstruction below the pronoun, and the PL-reading requires reconstruction below the quantifier, which is itself located below the pronoun. The solution to this conflict is to abort reconstruction and interpret the sentence unambiguously as a single question. In (4d), the position of the pronoun and the r-expression have been switched. Therefore nothing prevents reconstruction from taking place and the wh-phrase can get below the quantifier. The sentence is thus correctly predicted to have a PL-interpretation.

Notice that in (4d) reconstruction cannot occur to a position between the subject and the quantifier, since that will leave the implicit variable in the wh-determiner without a binder. This is why I have annotated the position with an asterisk. The interaction of

PL-readings with BT(C) in (4) establishes the need of syntactic reconstruction for the availability of PL-readings, just as the interaction of variable binding and BT(C) establish the need of reconstruction for variable binding. Once the need for syntactic reconstruction is established, something already achieved in chapter 2, one can drop variable binding in examples like (3) and still arrive at exactly the same conclusion:

(5) a. [Which (of the) paper(s) that John wrote to Ms. Brown2] (*SA, PL*)
did every student [___] get her2 _*_ to grade?

b. [Which (of the) paper(s) that John wrote to Ms. Brown2] (*SA, PL*)
did every student [___] ask her2 to read _*_ carefully?

In (5), the PL-reading requires reconstruction below the quantifier, as it was established in Chapter 2, and in examples like (4). BT(C) requires that reconstruction must take place to a position above the VP containing the pronoun *her*. Since the quantifier is in subject position, the wh-phrase must reconstruct below the subject position, given the PL-interpretation, but above the VP given BT(C). The combination of PL-readings and BT(C) in (5) thus identify a position between VP and IP where the *wh*-phrase reconstructs. As I said earlier, I will take the relevant position to be one of the possible Specs of the vP phrase. There are other contexts in which PL-interpretations, combined with some other constraint or generalization, help us identify the vP as a landing site of wh-movement. Consider the following examples involving weak islands.

(6) a. Which book does every student believe[no one to have read]? (*SA, PL*)

b. Which book does every student [regret that Bill read]? (*SA, PL*)

c. Which book does Bill [regret that every student read]? (*SA, *PL*)

Recall Longobardi's (1987) observation, discussed in chapter 2, section 1.5., according to which reconstruction into weak islands (WIs) is not possible for some not well-understood constraint. The bracketed constituents in (6) are WIs. Longobardi's observation tell us that the *wh*-phrase cannot be reconstructed for scope reasons into the bracketed constituent in the sentences in (6). The availability of the PL-interpretation in

(6a,b) tell us that the wh-phrase must be reconstructed below the subject. Combining the availability of PL-readings with LO we derive the conclusion that there must be a position between the matrix subject and the matrix verb where the wh-phrase is reconstructed. As in the case of example (3), the best candidate for such a position is the matrix vP. I will return to consider WIs again in section chapter 3, section 1.4. I will consider now whether there is evidence for the vP phrase independent of PL-interpretations and variable binding.

1.1.1 Evidence for the vP Cycle as a Landing Site: The case of Indonesian.

In the previous section we discussed evidence that suggests that *wh*-phrases stop at a position between the VP and the subject of the clause on their way to the COMP position. We also saw that movement from an embedded clause into the matrix COMP position also seems to stop at the same position before it gets to the final landing site. We have assumed that the relevant position is the vP phase. If this is so, then cyclic movement is movement that proceeds from the vP phrase into the CP, into the vP, and so on, until it reaches the final landing site. One should then expect to find some kind of evidence, other than the interpretive phenomena discussed in the previous section, showing that movement actually stops in these positions or cycles. In the case of the CP cycle, relevance evidence has been provided in works like those of Chung (1998), and McCloskey (2000a, 2000b). McCloskey (2000a), for instance discusses a dialect of English he calls The West Ulster dialect, in which wh-phrases like *what all*, *who all*, *where all*, etc, can strand the quantifier part in a number of positions that correspond to the CP cycle, as in his examples below.

(7) a. What all did he say (that) he wanted t?
b. What did he say _all_ (that) he wanted t?
c. Where do you think _all_ they'll want to visit t?
d. Who did Frank tell you _all_ that they were after t?
e. What do they claim _all_ (that) we did ?

The example in (7a) shows the wh-phrase and the quantifier sequence together at the edge of the clause. In all the other examples, i.e. (7b-d), the quantifier has been stranded in an intermediate position. McCloskey concludes that the relevant position is the CP phrase, and did not discover any case of stranding occurring at the level of the vP phrase.

This in itself does not show that *wh*-movement in the West Ulster dialect of English skips the vP phrase since McCloskey also argues that stranding the quantifier in a particular position is subject to a prosodic requirement. It could be that stranding the quantifier at the vP level might be in conflict with the postulated requirement or other syntactic constraint of sort.

Be this as it may, it is still fair to say that whereas much syntactic and/or morphological evidence has been shown to support movement through the CP phrase, no comparable evidence has been presented in support of movement through the vP phrase. I know of one example, however, that seems to provide evidence for movement of the latter type. The evidence concerns the interaction of A-bar movement with the verbal prefix *meN-* in Indonesian; an SVO language of the Austronesian family. This prefix has been treated as a transitivity, or agentivity marker (see Chung 1976, and Saddy 1991)[1], because it is affixed to every transitive verb. An example is given below.

(8) Yohanes men-citai Sally
Y. trans-loves Sally
Yohanes loves Sally

The basic *wh* words of Indonesian are *apa* 'what' and *siapa* 'who'. These words can combine with a noun to yield the equivalent of a *which*-phrase in English:

(9)	Indonesian Wh-words.	English glosses.
	a. Apa	'what'
	b. Siapa	'who'
	c. N(-human) + apa	'which N (-human)'

[1] But see Voskuil (1996, 2000) who argues that the relevant prefix indicates active voice.

ex. buku apa	'which book'
d. N(+ human) + siapa	'which N (+ human)'
ex. orang siapa	'which person'

Indonesian is an optional fronting language (Saddy 1991, Cheng 1997, Voskuil 1996, 2000). That is, wh-phrases in this language can either be displaced to the left edge of the clause, or they can be left in situ. Either way the sentence gets interpreted as a true information seeking matrix question. Two salient features characterize the fronting of a wh-argument in Indonesian: 1) the element *yang* is inserted immediately after the moved wh-phrase, and 2) the prefix *men* marking the transitivity of the verb must be deleted if the wh-argument is extracted from within the c-command domain of the verb. I will concentrate on the second feature, i.e. the interaction A-movement and *men*-deletion, for the rest of this section. Consider the following examples from Saddy (1991).

Subject Wh in situ:

(10) **Siapa** **men**-cintai Sally
who *trans-loves* *Sally*
'Who loves Sally?'

Subject WH moved:

(11) **Siapa**$_i$ yang t$_i$ **men**-cintai Sally
who *trans-loves Sally*
'Who loves Sally?'

Object WH in situ:

(12) Sally **men**-cintai **siapa**
Sally trans-loves who
'Who does Sally love?'

Object WH moved:

(13) **Siapa**$_i$ yang Sally ø-cintai t_i
who *Sally* *loves*
'Who does Sally love?'

As it can be seen in (11) and (13), when an argument *wh*-phrase is moved overtly, the element *yang* immediately follows the fronted phrase. Furthermore, if the *wh*-phrase has been extracted from inside the VP, the prefix men- on the verb must necessarily delete, as in (13). If the subject is extracted, the transitive marker remains. In multi-clausal examples, extraction of an argument of the mostly embedded predicate into the edge of the matrix clause triggers *men*-deletion in all the verbs c-commanding the extraction site:

(14) Bill **men**-gira Tom **men**-harap Fred **men**-cintai **siapa**.
B. *trans-thinks T.* *trans-expects F.* *trans-loves* *who*
'Who does Bill think Tom expects Fred to love?'

(15) **Siapa**$_i$ yang Bill ø-kira Tom ø-harap Fred ø-cintai t_i.
who *B.* *thinks* *T.* *expects* *F.* *loves*
'Who does Bill think Tom expects Fred to love?'

(16) ***Siapa**$_i$ yang Bill **men**-gira Tom **men**-harap Fred **men**-cintai t_i.
who *B.* *trans-thinks T.* *trans-expects F.* *trans-loves*
'Who does Bill think Tom expects Fred to love?'

(14) is an example of a multi-clausal question where the *wh*-phrase is pronounced in situ. In this case *men*-deletion is not required to apply, despite the fact that the sentence

receives a matrix question interpretation[2]. (15) shows, that overt extraction of the *wh*-phrase triggers *men*-deletion in all the verbs along the path of the extraction. If *men*-deletion does not apply, the result is ungrammatical as in (16).

One should notice that although subjects do not trigger men-deletion in the clause they originate, subject extraction from an embedded clause causes men-deletion of all the verbs along the path of the extraction just as is the case with object extraction:

(17) Bill **men**-gira Tom **men**-harap **siapa** **men**-cintai Fred
Bill trans-thinks T. trans-expects who trans-loves F.
'Who does Bill think Tom expects to love Fred?'

(18) **Siapa**$_i$ yang Bill **ø**-gira Tom **ø**-harap t_i **men**-cintai Fred
Bill trans-thinks T. trans-expects who trans-loves F.
'Who does Bill think Tom expects to love Fred?'

In (17) the subject of the most deeply embedded clause is pronounced in situ and men-deletion does not take place in either of the verbs. By contrast in (18) the relevant *wh*-phrase has been fronted overtly, the prefix of all the verbs along the path of the extraction must be deleted, although the prefix of the most deeply embedded verb remains.

Men-deletion is not a phenomenon exclusive to the fronting of *wh*-phrases. It is also found in relativization, topicalization, and tough-movement constructions as the following examples from Voskuil (2000) shows.

Relativization:

(19) Inilah buku yang Badu sudah (***mem**)-baca.
this-expl. book Badu Perf. trans-read.

[2] Saddy (1991) assumes that *men*-deletion is optional in the case of *wh*-in-situ. My Indonesian informants, however, find that if *men*- is deleted when the *wh*-phrase is pronounced in situ, the resulting sentence is somewhat marginal. In any event, the important point about men-deletion is that it is obligatory in the case of overt extraction as in (15): witness the ungrammaticality of (16).

'This is the book that Badu has already read.'

Topicalization.

(20) Buku ini Badu sudah (***mem**)-baca.
book this B. Perf. trans-read.
'This book, Badu has already read.'

Tough-momement.

(21) Buku ini susah untuk (***men**)-baca.
book this difficult COMP. trans-read.
'This book is difficult to read'

(19)-(20) show that *men-* has a blocking effect in other *wh*-constructions such as relativization, topicalization, and tough constructions: the constructions are acceptable if the prefix is deleted.

The only attempt I know of trying to explain the interaction of A-bar movement with *men*-deletion is that of Voskuil (2000). Voskuil basically assumes that there are two types of transitive verbs: those marked with *men-* which he takes to be in the morphological active voice, and those that are unmarked, which he takes to be in what he calls the bare active voice. He claims that the morphological active blocks movement, but that the prefix on the verb licenses the conversion of a trace into a resumptive pronominal in object position of the verb, given his pronoun principle. As a result, illicit movement over *men-* is possible whenever the trace can successfully be analyzed as a resumptive pronoun. The reason why (19)-(20) are ill-formed, in this view, has to do with the fact that the trace in object position, being analyzed as resumptive pronoun, is too close to the binder: he argues, that resumptive pronouns in Indonesian are subject to an anti-subjacency requirement.

Voskuil's account, however, makes the wrong prediction when checked against the multi-clausal examples discussed in (14)-(18). If his account were correct, the

sentence in (16) should be grammatical. The prefix on the lower verb will allow us to analyze the trace as a resumptive pronoun. After this, movement over any number of instances of the relevant prefix will become possible. The anti-subjacency requirement of the resumptive pronoun is met because the binder sits in the COMP position of the matrix clause. As a result, sentence (16) is incorrectly predicted to be grammatical.
I will borrow the assumption that men-blocks A'-movement from Voskuil. Since this suffix is realized on transitive verbs, and since such verbs are introduced by the little v head, at least under some theories of the structure of VPs.

I want to suggest that *men*-deletion is the signature of successive cyclic movement through the Spec of the vP phase. If this suggestion turns out to be on the right track, he have found sound syntactic evidence for the vP as a landing site of *wh*-movement. I will assume that an analysis along the lines of the previous suggestion will turn out to be basically correct for Indonesian, hoping that future research will make it clearer, and will uncover more syntactic evidence for the vP cycle from other languages.

In summary, we have seen so far that there is evidence based on the interaction of PL-readings with BT(C) that *wh*-movement proceeds through a position located between the VP and the subject of the clause, which I have assumed to be the vP phase. This is the same conclusion that Fox (2000) arrives at on the basis of the interaction of variable binding and BT(C).

The parallelism between variable binding and PL-interpretations with respect to the way in which they interact with BT reconstruction effects is a natural expectation of the view advocated in this dissertation, in which PL-readings are in fact a particular case of variable binding: the case involving binding of the implicit variable in the *wh*-determiner.

We also saw that there seems to be some independent syntactic evidence, from Indonesian, supporting the path of movement through the vP phase. I will return to Indonesian in section 2.3.1, where I will examine wh-quantifier interaction in that language. In the following section, I will test the reliability of PL-readings as a diagnostic for cyclicity by examining constructions in which successive ciclicity is not possible, as the wh dependencies involved span strong islands, which generally block movement. We will see that in such conditions the PL-interpretation is missing.

1.2. Resumptive Chains with Universal Quantifiers.

In this section, I will examine structures involving *wh* dependencies with universal quantifiers in which the tail or structurally lower member of the wh dependency is a *resumptive pronoun*. I will use the term *resumptive chains* to refer to such dependencies (cf. Dermirdache 1991). For the purpose of this section I will consider a resumptive pronoun to be a pronoun occurring in a position that might have been taken by a *wh*-trace (cf. Chao and Sells 1983, Sells 1984), regardless of the (un)grammaticality of the construction. By this I mean that a resumptive chain will consist of a *wh*-phrase in a COMP position and a pronoun in some theta position that is bound by the operator from the COMP position. Notice that in such a case the operator will only enter the semantic interpretation of the sentence if it binds the pronoun. This is because the COMP position is not an argument position, and the only way to relate the *wh*-operator to a thematic position is via binding of the pronominal at the tail of the chain. Thus, unless the *wh*-operator binds the tail of the chain, it will not be interpreted. This is a simple view, which is basically the view suggested in Chomsky (1982), after one discounts the theory-internal technicalities of the GB approach.

Here, I will not adopt the dichotomy proposed in Chao and Sells (1983) and Sells (1984) according to which of the pronouns that has been considered resumptive, as in Chomsky (1982) and Ross (1967), we can derive two classes: true resumptive pronouns, and what they call *intrusive pronouns*. The reason for not adopting the proposed dichotomy is that I am not convinced by Sells's (1984) treatment of his so-called intrusive pronouns in English. I discuss his proposal in some details below.

1.2.1. Sells' View of Resumptive Pronouns.

According to Sells (1984), the pronouns that has been traditionally been called resumptive pronouns in English are actually not true resumptive pronouns. He defines a resumptive pronoun as a pronoun that is bound by an operator much in the same way in which variables are bound. He considers the contrast below from Sells and Chao (1983).

(22) a. I'd like to meet the linguist that Mary couldn't remember if she had seen __/him before.

b. I'd like to meet every linguist that Mary couldn't remember if she had seen __/*him before.

Sells observes that whereas in (22a) either the gap or the pronoun is acceptable, in (22b) the pronoun is unacceptable. He adopts the account given in Chao and Sells (1983) according to which the distinction between (22a) and (22b) is that the head of the relative clause is a referential expression in the former example, and a quantificational one in the latter sentence.

From these fact, sells concludes that the pronoun in (22) cannot be bound by an operator, but that they can be linked to and antecedent by some other way. Coreference, for instance, is a candidate to explain why the pronoun is fine in the first sentence in (22), but not in the second. The idea being that quantifiers do not participate in coreference as they are not referential expressions, whereas definite description as the one in (22a) can. From this Sells conclude that the resumptive pronouns in (22) are not resumptive pronoun given his definition in (23).

(23) A resumptive pronoun is a pronoun that is operator bound (Sells 1984, p. 16)

It doesn't seem to me, however, that the contrast in (22) is just based on a referential-non referential distinction. For instance the following examples are better when the antecedent of the pronoun is a quantifier of the form any-NP, than when it is one of the form every-NP:

(24) a. I'd like to suggest any witness that the defense doesn't even suspect that putting him on the stand would be a mistake

b. ?*I'd like to suggest every witness that the defense doesn't even suspect that putting him on the stand would be a mistake

Resumptive pronouns are not available in every dialect of English as is known since Ross (1967), and so reliable judgments for the pair of sentences in (24) is available only on a limited basis. However, to the extent that I found a speaker that accepted (24a), given a plausible scenario, (24b) was judged somewhat worse.

Now here the relevant distinction cannot be the referential nature of the phrase containing the head of the relative clause since there is no sense in which *any witness* is referential. That is, there is no particular individual out there that the phrase *any witness* singles out or introduces to the discourse. Sells himself cites examples in which a universal like *every* does bind a resumptive inside the relative clause. (25a) is his example, in (25b) I have replaced *every* by *any*.

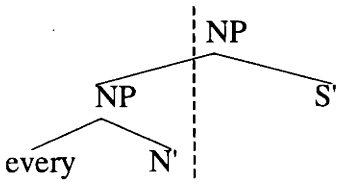
(25) a. Every text-book in syntax that when you've read it you're any the wiser is published by Zeek Inc.

b. Any text-book in syntax that when you've read it you're any the wiser is published by Zeek Inc.

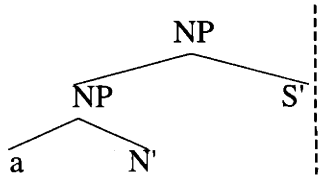
For Sells, (25a) is ungrammatical and he explains the grammaticality of that example in another dialects by assuming than in such dialects the structure of the relative clause is such that it allows the universal to really bind the pronoun, which is not the case in his dialect. But this mean that in his dialect he has to postulate two different structures for relative clauses depending on whether the determiner that the head noun restricts is a definite or a universal like every. The situation can be illustrated as in (26).

Dialect 1 (= Sells dialect)

(26) a.

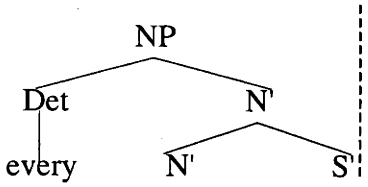


b.



Dialect 2

(27)



In order to explain the difference between (25), in dialect 2, and (22b) in Sells' dialect, he assumes that relative clauses in the latter dialect have the structure in (26), whereas the dialect where (25) is fine is assumed to have the structure in (27). A further assumption is that an indefinite can bind pronoun beyond the N' position, but that a universal cannot. This is indicated by broken vertical line in (26).

However, as Partee (1975) points out, if one pays attention to the semantics of relative clauses, (26) cannot be the right structure for relative clauses in any dialect of English. This is because in that structure the restrictor of the determiner is never a constituent with the relative clause and so the determiner will combine first with the noun and the result will then compose with the relative clause. But that will result in the wrong truth conditions for the sentence of which the DP containing the relative is a part. To see this consider the case in which the determiner position in (26) is taken by the definite article *the*. As Partee remarks, the definite determiner requires that the extension of the predicate restricting it contains only one member. If the definite article composes with the noun first, as in (26), the uniqueness requirement of the determiner will have to be satisfied only by the noun. This means that a sentence like (28a) should mean something like (28b).

(28) a. The woman that is standing smokes.

b. There is a unique woman, and that woman is standing and smokes.

But this predicts that in a situation in which we are, say, at a party where there are several women smoking, but only one of them standing, (28a) should be either false or not have a truth value at all; depending on whether one sides with Russell or Frege as to what the correct characterization of definite NPs is. This prediction is blatantly false,

since native speakers of English (including Sells I suspect) judge (28a) to be true in the situation just described.

It turns out that a structure like (27), which Sells assumes for dialect 2, yields the right truth conditions. In that structure the relative clause composes with the noun restrictor first, and the result composes with the determiner. Since the noun denotes a set of individuals and the relative clause also denotes a set of individuals, as semanticists have assumed since Quine (1960), the head noun and the relative clause compose by intersective modification. That is, when we assign the relative clause in an example like (28a) the structure in (27) the sequence *woman that is standing* becomes a constituent denoting the set of individuals that are both women and are standing. The definite article then requires that there is only one individual in the extension of that set, that is, that there is only one woman that is standing. Others women that are sitting or in bed, do not mess up the uniqueness requirement in this case.

Clearly, then, the intersective analysis of the relative clause made possible by the structure in (27) is the one that appears to get us the right analysis of relative clauses for every dialect of English. Therefore, one should not give it up in order to explain contrasts like those between (22b) and (25), which should therefore be explained through alternative means.

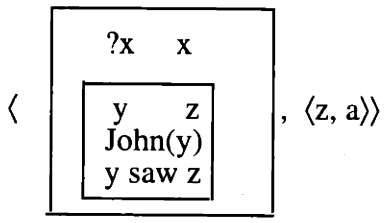
Sells's claim that resumptive pronouns (intrusive pronoun in his terms) cannot be bound by an operator, seems even more difficult to defend when one considers *wh*-phrases, which has been traditionally considered A'-operators. Consider a simple example like (29) and pretends that it is acceptable for the sake of the exposition.

(29) **Who** did John see **her**?

The question here is how the wh-phrase is interpreted if it does not bind the pronoun. The expectation from the transformational treatment of wh-phrases and semantic analyses such as that of Karttunen (1977), is that if the wh-phrase, being an operator, does not bind a variable, the result will be vacuous quantification which, arguably, leads to ungrammaticality in natural language.

Nevertheless, Sells argues that in examples like (29), the *wh*-phrase does not bind the pronoun directly. Rather, he argues that *wh*-phrases like indefinites set up discourse referents, as in Discourse Representation Theory (DRT) (Kamp 1981, and Heim 1982), that can be picked up later in subsequent discourse. Sells does not develop an explicit theory of questions in DRT, but sketches in some details what the semantics of sentences like (29) might look like using so-called *discourse representation structures* (DRS)[3]. He proposes the DRS in (30) for sentence (29).

(30)



A DRS is, informally, a box containing a fragment of discourse. DRSs consist of a set of discourse referents that represent the entities which the sentences of the discourse are about. The set of discourse referents, is given on top of the box using lower case letter coming late in the alphabet (e.g., u, v, x, etc) and is called the *discourse universe* (Kamp and Reyle 1993). In DRSs the scope of operators and connective is represented by including scope domain of the operator inside a box and representing the given operator immediately outside the box. The box that represents the scope of a given operator is itself a DRS. This phenomenon is known as *embedding*.

With this background in mind, let us consider Sells's analysis for the question in (29). The DRS in (30) treats the *wh*-phrase as an indefinite with respect to the fact that it introduces the discourse referent *x* on top of the main box. It also treats it as a scope bearing operator indicated by the fact that the question operator represented by ?*x* takes scope over the inner box corresponding to the material dominated by the sentence *John see her* (i.e., the part dominated by IP in our parlance). The inner DRS has two discourse

[3] I will not discuss here how DRSs are constructed in their finest details, although I will explain the process at the level of generality necessary for the understanding of the foregoing discussion. The reader interested in the finest details of DRS construction can consult Chapters 1, and 2 of Kamp and Reyle (1993), or Chapter ?? of Gamut (1991).

referents, y and *z*, and two conditions stating, respectively, that y is John and that y saw z, *z* is the discourse referent associated with the pronoun *her*.

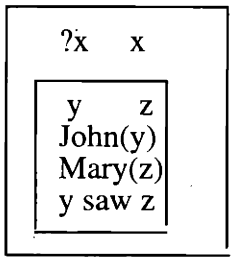
Notice that there is no condition relating *z* to *x* in any of the boxes which would be necessary if the *wh*-phrase were treated as binding the pronoun. So the question of how the *wh*-operator is related to the pronoun hasn't yet been addressed. Sells argues that in the discourse representation in (30) the discourse referent *z* can be anchored to some individual *a*; this is indicated by the notation ⟨z, a⟩ at the right side of the boxes. He then concludes that "the only interpretation that will relate the markers *x* and *z* (i.e. as if the *who* binds the *her*) will be where *x* is also anchored to *a*" (Sells 1984 p. 476).

What this means is that in questions with pronouns occupying the position of the *wh*-trace, like (29), the pronoun can pick out an individual independent of the *wh*-phrase, and the sentence will be have an interpretation that gives the illusion of binding, when the individual that the wh-phrase "picks out" happens to be the one that the pronoun picks out, i.e., when the pronoun is anchored to the same individual that answers the question. This however, seems circular: to determine whether the proposition inside the box counts as an answer to the question, we must anchor the pronoun to some individual a, but we must make sure that we are anchoring the pronoun to the individual that qualifies as an answer to the question. So it seems that we need the answer to the question before we are able to decide whether a particular proposition counts as an answer.

Even if circularity is side-stepped in some way, Sells' analysis predicts that sentences of the form in (31) where we substitute a the proper name Mary for the pronoun in object position should be well formed if the answer to the question happens to be Mary. To see this consider the corresponding DRS in (32).

(31) *Who did John see Mary?

(32)



The DRS in (32) is like the one in (30), with the difference that here the object of the clause introduces a discourse referent that is the bearer of the name Mary. Let us assume that the individual that bears the name Mary is *a*. If the *wh*-phrase can be anchored to an individual as in (30), nothing prevents the same from happening here. So if the *wh*-phrase is anchored to the individual that bears the name Mary. The sentence in (31) should be interpreted in Sells' theory.

This is, certainly, a very unwanted result, predicting that structures instantiating vacuous quantification as (31), should always be grammatical, provided the sentence corresponding to the IP node is true (i.e. John saw Mary in (31)). For the previous reasons, I will not adopt Sells' dichotomy (i.e. the intrusive-resumptive distinction) and will consider any pronoun a resumptive pronoun if it is the tail of a *wh*-chain containing just one theta-role. With this background in place, I proceed now to examine the interpretation of questions involving resumptive chains and universal quntifiers.

1.2.2 Interpreting Resumptive Chains.

Doron (1982) notes that relative clauses with universal quantifiers exhibit different scopal properties depending on whether the head of the relative clause is associated with a gap or a resumptive pronoun inside the relative. Consider her examples below.

(33) a. ha' isa se kol gever baxar __ tislax lo tmuna
the woman that every man chose__ will-send to him a-picture
b. ha' isa se kol gever baxar <u>ota</u> tislax lo tmuna
the woman that every man chose <u>her</u> will-send to him a-picture

The sentence in (33a), where the head of the relative is related to a gap inside the relative is ambiguous between a single individual reading and a *multipiple individual* reading (MIR). Under the multiple individual interpretation, for each man x, the sentence is about

the woman that x chose, so the universal quantifier seems to take scope above the head of the relative clause.

By contrast the sentence in (33b) where the resumptive strategy is used is unambiguous allowing only the single individual reading. Sharvit (1997) shows that the distribution of the MIR in relative clauses has exactly the same distribution of PL-readings in questions and proposes a theory that explains the distribution of both types of readings using the same syntactic and semantic tools. I propose a treatment of MIRs under the reconstruction approach in Agüero-Bautista (2000c) and so I will not reproduce the data here. What is relevant to the discussion at hand is that what is true for the MIR is also true for PL-readings in questions. Thus, Doron's facts are also found in questions involving resumptive chains. Consider the following examples which are variations of similar examples in Sells (1984).

(34) **Which student**$_k$ does every professor deny to have said whether **she**$_k$ will make a good faculty. (*SA, *PL*)

(35) **Who**$_k$ did every witness say that you'd forgotten whether **she**$_k$ had paid her fees? (*SA, *PL*)

(36) **Which student** does every professor regrets that Peter recommended__? (*SA, PL*)

To the extent that speakers judged the sentences in (34)-(35) acceptable, they consistently excluded pair-lists as possible answers for those questions. Notice that this contrasts with the situation in (36) where the (PL) interpretation is available. The difference cannot be attributed to the distance between the quantifier and the *wh*-phrase in the COMP position since the distance is the same in the three sentences. Rather the difference is the same that we found in Doron's facts in (33): when the relevant operator is related to a gap, the PL-reading (= the MIR) is possible, but when the operator is related to a resumptive pronoun, the only the single individual reading is possible. Notice further, that (34)-(36) constitutes additional evidence for an approach that raises the

quantifier above the *wh*-phrase in COMP by QR or quantifying-in. If one quantifies in the universal in this cases, the resulting LF for a sentence like (35) will be (37).

(37) [Every x : x is a witness] [who$_k$ did x say that you had forgotten whether she$_k$ had paid her fees]

But this LF assigns a family-of-questions interpretation to (35), incorrectly predicting that PL-answers should be possible for that sentence. Here there does not seem to be a way out for the quantifying-in approach. For instance, it is not plausible to claim that quantifying in takes place after all but that the meaning of resumptive pronouns is such that it forces some sort of indexical interpretation for the *wh*-phrase therefore making the whole dependency scopeless, as in Kaplan's (1977, 1989) theory of indexicals, which would in effect gives one the feeling that the *wh*-phrase always takes maximal scope in such constructions. For one thing, however, we need to preserve the operator status of the *wh*-phrase in order to be able to interpret the structure as a question, and even if this obstacle can be side-stepped, it is false that resumptive chains fail to take narrow scope. The relevant evidence also comes from Doron's (1982) work. Consider the following examples.

(38) a. kol gever yimca et ha' isa se hu mexapes __
every man will-find the woman that he seeks __
b. kol gever yimca et ha' isa se hu mexapes ota
every man will-find the woman that he seeks her

(38a) is three ways ambiguous, with any of the interpretations given in (39).

(39) a. There is a particular individual that is a woman (e.g., Rigoberta Mechú) and every man is looking for her and will find her.

b. Each man is looking for a woman that is particular to him (e.g., John is looking for Rigoberta, Danny is looking for Mary, and Joe for Ann) and he will find

her.

c. Each man is looking for a woman with certain properties, even if such women does not exist (e.g. John is looking for a freedom-fighter, Danny is looking for an American queen, and Joe is looking for a militant feminist)

In the reading in (39b), the universal quantifier is clearly taking scope above the resumptive dependency. The reading in (38c) is some kind of intentional reading of the head of the relative clause; what Sells (1984) calls a *concept* reading. The concept reading, i.e. (38c), is the only reading missing in the relative clause involving the resumptive chain in (37b).

This means that there is nothing wrong with a resumptive chain taking narrow scope with respect to a quantifier that occurs higher in the structure. This in turn means that there should be no problem with the universal quantifier taking scope over the resumptive dependencies in (34)-(35) either if raising the quantifier over the interrogative clause were an option as in quantifying-in approaches. The contrast in (34)-(36) constitutes therefore additional evidence against quantifying-in approaches to scope ambiguities in *wh*-quantifier interactions.

By contrast, under the reconstruction view defended in this investigation, the relevant contrast receives a natural explanation under the assumption that the *wh*-phrase is merged in COMP and the pronoun is merged in the theta position. Since the *wh*-phrase has never been inside the clause it has not used the cyclic positions. Therefore there are no copies of the *wh*-phrase in any of the potential intermediate sites below the universal quantifier in the matrix clause and so the quantifier will not be able to bind an implicit variable in the *wh*-determiner position. PL-readings, thus, tell us that *wh*-dependencies with resumption, like those in (34)-(35), are not constructed via successive cyclic movement.

Notice, now, that by the same logic, the fact that (36) allows PL-readings indicates that the wh-phrase has been extracted from the c-command domain of the quantifier in a cyclic fashion, i.e. through the intermediate cycles. This is not possible, however, if extraction out of weak islands (WIs) is treated as involving base-generation of null resumptive pronoun in theta position and merging the wh-phrase in COMP as

basically suggested by Cinque (1990) and Manzini (1998) in an attempt to explain the selective nature of WIs. Such an analysis predicts incorrectly that (36) should have the same interpretation as (34)-(36); certainly an incorrect prediction. I will return to this point in section 1.4, where I will revisit Longobardi's observation while discussing the selective nature of WIs. In the next section, I will discuss data from Spanish showing that null resumptive pronouns behave just like the overt ones, in guaranteeing maximal scope for the *wh*-phrase binding it.

1.2.3. Questions, Quantifiers, and Clitic-Doubling in Spanish.

The issues related with the phenomenon of *clitic-doubling* in Spanish are quite intricate and complex, deserving a more ample treatment than the one I can afford to give it in this dissertation[4]. The biggest puzzle of the phenomenon, as it manifests itself in Spanish, concerns certain differences between the 3rd person accusative clitics *lo/la* 'him/her' and the 3rd person dative clitic *le* 'him/her'. The relevant differences are subject to dialectal variations, but there are features that are general across dialects. In all dialects of Spanish clitic doubling with both *le* and *lo* is obligatory if the associate of the clitic (i.e., the doubling NP) is a pronoun. Consider Suñer's examples below.

(40) a. Le hablaron a ella.
himD-speak-p-pl. to her
'They spoke to her'

b. Les regalaron un disco a ellos.
ThemD-give-p-pl a record to them
'They gave a record to them.

[4] The literature on Spanish clitic doubling is extensive. Some early attempts to determine the what and/or why of the phenomenon are Lenz (1920), Ransey (1956), Poston (1953), Fish (1958), Roldán (1971), and Strozer (1976). More recent and elaborated accounts are those of Jaeggli (1982, 19856), Hurtado (1984), Suñer (1988), and Torrego (1995).

(41) a. La llamaron a ella
herA-call-p-pl. to her
'They called her'
b. Lo llamaron a él
himA-call-p-pl. to him
'They called him'

However, when extraction is considered, these two clitics part company even in dialects of Spanish that are rather permissive with respect to the distribution of clitic doubling :

(42) a. ¿A quién le regalaron un auto?
to whom him/her-D give-p-pl. a car
'Whom did they give a car to?'
b. *¿A quién lo condecoraron?
to whom him/her-A decorate-p-pl.
'Whom did they decorate?'

There are to my knowledge five different proposals trying to explain the contrast between the dative and the accusative clitic as exemplified in (41a-b): those of Aoun (1981), Jaeggli (1982), Borer (1984), Suñer (1988), and Torrego (1995). In the remaining of this section I will do two things: 1) I will discuss in some detail each of these approaches showing that they run into problems once one moves to consider bi-clausal examples, as those in (42)-(43), where the clitics *le* and *lo* again join company, and 2) I will then show that using PL-readings as a diagnostic for cyclicity can shed some light on the phenomenon.

(43) ¿**A quién** dijo Pedro que María **le** quería pegar?
to whom said P. that M. himD-wanted to hit
'whom did Pedro say that María wanted to hit?'

(44) ¿**A cual hombre** dijo Pedro que Maria **lo** quería matar ?
to which man said P. that M. himA-wanted to kill
'whom did Pedro say that María wanted to kill him?'

(45) **A quién** dijo Pedro que María **le** encontro una cana?
to whom said P. that M. himD-find-p-s. a white hair
'Whom did Pedro say that María found a white hair on him?'

(46) **A quién** dijo Pedro que María **lo** encontro robando?
to whom said P. that M. himA-find-p-s. stealing.
'Whom did Pedro say that María caught him stealing?'

The sentences in (43) and (45) show that the accusative clitic lo can co-occur with a *wh*-phrase provided that the distance between the *wh*-phrase and the clitic is bigger that the one in examples like (41b). Thus for instance the example in (43) is at least bi-clausal, depending on whether or not the sequence *quería mantar* 'wanted to kill' is treated in terms of reanalysis. None of the proposals that have attempted to explain the contrast in (41) has considered multi-clausal examples like (42)-(45), so let us see whether those accounts can extend to these examples on a one by one basis.

1.2.3.1. Aoun's (1981) Account.

Aoun (1981) proposes to solve the contrast in (41) by assuming that clitics may optionally absorb a theta role. He argues that when a clitic absorb a theta role, it is an R-expression (i.e. an argument) and its associate must, consequently, be demoted to non-argument status being no longer extractable. If the clitic does not absorb a theta role, its associate preserve its argument status and can therefore be extracted. He then stipulates that accusative clitics are theta-role absorbers in Spanish, but that dative clitics are not. This analysis is supposed to account for the contrast in (41) since it predicts that extraction should always be blocked by the accusative clitic. However, the grammaticality of the the multi-clausal examples in (43) and (45) clearly show that

cannot be the end of the story. I will therefore drop this analysis here and move to consider a second alternative.

1.2.3.2. Jaeggli's (1982) Proposal.

The account offered in Jaeggli (1982) to explain the contrast exemplified in (41) is based on the *Empty Category Principle* (ECP) of Chomsky (1981). Jaeggli argues that the relevant distinction is a categorial one: direct objects (DOs) are NPs, whereas indirect objects (IOs) are PPs when they are doubled by a clitic. The analysis assumes that clitics absorb s-government and case, robbing the verb, so to speak, of its L-marking properties. Under this analysis, extraction in (41b) is bad because the verb can no longer properly govern the empty category in object position, therefore violating the ECP. Extraction is fine in (41a), because the dative preposition theta marks the trace of movement satisfying thereby the ECP[5]. Notice, however, that Just like the previous account this proposal cannot be extended to cover the examples in (43) and (45). Without further discussion then let us move to consider the next one.

1.2.3.3. Borer's (1984) Case Agreement Account.

In Borer's (1984) analysis, the clitic doubled position is always properly governed; not by the verb, but by the clitic itself through coindexation[6]. She assumes that the preposition *a* found in clitic doubling uniformly assigns dative case to both DOs and IOs. Under the assumption that Case agreement is a condition on proper government, the ungrammaticality of (41b) will follow from a Case mismatch: the preposition assigns dative and the clitic *lo* bears accusative case. Extraction is possible in (41a) because the Case that the preposition assigns and the one that *le* bears are both dative. Like all the

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[5] This analysis requires reconstruction of the preposition to its original site, which is not problematic given that only the wh-operator is interpreted semantically at the COMP position.

[6] See Borer (1981) for the adopted definition of proper government.

previous account, however, this account cannot be extended to the multi-clausal cases considered before. Let us turn our attention, then, to the following proposal.

1.2.3.4. Torrego's (1995) Proposal.

Torrego's (1995) account of the ungrammaticality of sentences like (41b) is based on the operation Move F proposed in Chomsky (1993, 1995). She assumes that a direct object wh-phrase that is attracted from the COMP position has to enter into a checking relation with the object clitic *lo*. She argues that the Case-checking mechanism of *lo* implicates all the formal features of the associate (what she calls *strong agreement*). Thus, when an object wh-phrase enters into a checking relation with *lo*, its *wh*-feature "becomes inaccessible to the wh-feature of the complementizer that drives the object to raise in the first place" (p. 4).

Again, this account by itself cannot explain the grammaticality of examples like those in (43) and (45), and so I won't consider it any longer. I turn now to consider the last account.

1.2.3.5. Suñer's (1988) *Matching* Account.

The account defended in Suñer (1988) argues that there is no fundamental difference between the accusative and dative clitics with respect to doubling. She argues that, like the members of any chain, the elements in a clitic chain must agree or, rather, their feature must not mismatch. In her view, the dative clitic *le* is underspecified for features, (e.g. *le* doesn't bear gender features) whereas *lo* is specified with the feature [+specific] as a result, *le* can be doubled by any NP, whereas *lo* can only be doubled by NPs that match the [+specific] feature of that clitic. For Suñer, thus, the problem with (41b) is that the *wh*-phrase does not match the specificity of the clitic. She argues that extraction is possible, both overt and covert, whenever a *wh*-phrase, or a quantificational phrase for that matter, matches the features of *lo*. In her system only partitive phrases are specific enough, so to speak, to match the specificity of the clitic. As evidence that *lo* can

be doubled by quantificational phrases, which under her analysis must QR, and therefore extract at LF, she gives contrasts like the following.

(47) a. (*Lo) Entrevistaron a cada cadidato por media hora.
himA-Interview-p-pl. to each candidate for half an hour.
'They interview each candidate for half an hour'
b. (*Los) Entrevistaron a muchos/varios candidatos.
himA-Interview-p-pl. to many/several candidates
'They interview many/several candidates.'

(48) El médico los examino a cada uno/varios/muchos de los pacientes.
the physician themA-examine-p-s. to each one/several/many of the patients
The physician examined each/several/many of the patients.

Suñer concludes that the key distinction in (47)-(48) is the partitivity of the quantificational phrase. She argues that the quantificational phrases in (48) contain a definite NP with a [+specific] feature that percolates all the way up to the whole quantificational phrase. As a result the object quantifiers in (48) match the features of *lo*, but the one in (47) doesn't. A confounding factor in these examples, not discussed by Suñer, is the plurality of the clitic in (48). One needs to shift to the plural version of the clitic in partitive constructions for the sentences to be acceptable:

(49) *El médico lo examino a cada uno de los pacientes.
the physician themA-examine-p-s. to each one of the patients
'The physician examined each of the patients'.

Partitives in which the determiner heading the construction is *cada* 'each' normally trigger singular agreement with the verb when used as subjects:

(50) Cada uno de los estudiantes vino/?*vinieron
each on of the students come-p-s./come-p-pl.

'each of the students came.'

So the ungrammaticality of (49) remains unexplained if quantificational phrases can really double the accusative clitic. I will return to this point below when I present my account of the facts.

Observe, now, that whatever merits Suñer's account may have, it still is not enough to account for the examples in (44) and (46), repeated below for convenience, since the *wh*-phrases in the COMP position are not partitives, and as a result are excluded in her analysis as they do not match the features of the quantifier *lo*.

(44) ¿**A cual hombre** dijo Pedro que Maria **lo** quería matar ?
to which man said P. that M. himA-wanted to kill
'whom did Pedro say that María wanted to kill him?'

(46) **A quién** dijo Pedro que María **lo** encontro robando?
to whom said P. that M. himA-find-p-s. stealing.
'Whom did Pedro say that María caught him stealing?'

At this point it is helpful to summarize the debate to better assess the state of the art as to the phenomenon of clitic doubling in Spanish. The first four approaches discussed above claim that extraction is not possible, simpliciter, from a clitic doubling construction. Suñer, on the other hand, holds that there is not real distinction between the accusative and the dative clitic with respect to extraction, but that what matters is that the features of the clitic and its associate match in each case. Is it possible to construct a third type of approach that combines, perhaps, insights of the previous two types. Such an approach would have to maintain the following premises:

(51) a. Extraction is never possible with the clitic *lo*.
b. There's a fundamental distinction between *le* and *lo*: extraction is possible with the former, never with the latter.
c. The features of *lo* and its associate must always match in specificity.

In the next section I will argue that when we examine the clitic doubling construction with the help of PL-readings as a diagnostic for cyclicity, the picture that emerges is one in which the best approach to handle the extraction facts discussed above is one in which all three premises in (51) are maintained, except, that (51c) is strengthened to (52).

(52) The features of *lo* and its associate must always match in *referentiality*., i.e. only referential elements (i.e., type e) can double the clitic *lo*

I will propose such an account in the following section.

1.2.4. The Role of Resumption in Clitic-Doubling Constructions in Spanish.

When one places quantifiers in the apparent extraction cases in clitic doubling construction involving multi-clausal sentences like the ones in (43)-(46) to test for the availability of scope ambiguities, the results are surprising. The following examples are modifications of earlier ones.

(53) ¿**A quién** dijo cada testigo que María **le** quería pegar?
to whom said each witness that M. himD-wanted to hit
'whom did each witness say that María wanted to hit?'

(*SA, PL, CR*)

(54) ¿**A quién** dijo María que cada testigo **le** quería pegar?
to whom said M. that each witness himD-wanted to hit
'whom did Maria say that each witness wanted to hit?'

(*SA, PL, CR*)

(55) ¿**A cual hombre** dijo cada testigo que Maria **lo** quería matar ?
to which man said each witness that M. himA-wanted to kill
'Which man did each witness say that María wanted to kill him?'

*(SA, *PL, *CR)*

(56) **A quién** dijo María que cada testigo **lo** encontro robando?
to whom said M. that each witness himA-find-p-s. stealing.
'Whom did Pedro say that María caught him stealing?'

*(SA, *PL, *CR)*

The examples in (53)-(54) are ambiguous allowing single answer, a PL-interpretation, or what Sells (1984) calls a *concept reading* (CR) discussed in section 1.2.2. These readings are available regardless of whether the quantifier is in the embedded or the matrix clause. So for instance, (53) can be answered by the Spanish equivalent of the English answers in (57). Parenthesis indicate that the material enclosed can be elided to yield *so*-called abbreviated answers.

(57) a. (Every witness said that Mary wanted to hit) Bill. *(Single Answer)*
b. Jane said that Mary wanted to hit Bill, John said that she wanted to hit Sarah, and Sue said that Mary wanted to hit the teacher. *(Pair-list)*
c. (Every witness said that Mary wanted to hit) a militant feminist.
(Concept Reading (CR))

By contrast, in the questions in (55)-(56), both the PL-interpretation, and the CR are missing. These questions cannot be answered with any Spanish equivalents of the English answers in (57b-c). This result is very surprising if the examples in (53)-(56) uniformly involve extraction out of a clitic-doubled position. Notice, however, that the behavior of (55)-(56) is entirely parallel to Doron's facts discussed in section 1.2.2 regarding the interpretation of resumptive chains. In that section I concluded that the absence of PL-reading, suggested that resumptive chains were not constructed via successive cyclic movement. Likewise, the absence of PL-readings in (55)-(56), suggests that whatever wh-dependencies are involved in these constructions with *lo*, are not derived via successive cyclic movement.

So how are they derived? A plausible hypothesis is that *wh*-constructions with *lo* involve a null resumptive pronoun that is the associate of the clitic. That is the clitic is doubled, but not by the wh-phrase, but by a null resumptive pronoun that gets bound by a wh-phrase base-generated (*externally merged*) in the COMP position.

Notice that with this hypothesis we can develop a theory of clitic doubling with *lo* that incorporates each of the premises in (51a-b) and (52): *wh*-extraction is impossible out of a clitic doubling construction involving *lo*, because that clitic can never be doubled by a *wh*-phrase; and that clitic can never be doubled by a *wh*-phrase because it requires its associate to be a referential NP (i.e., of type e). This being the case, the only way to ever form questions with *lo*, is to double that clitic with a resumptive pronoun, to satisfy the referentiality requirement, and then have the pronoun bound from the COMP position by a *wh*-phrase.

Notice here, that the present analysis has been made possible because the present use of the PL-interpretation as a diagnostic for cyclicity, something that was not possible in previous approaches to *wh*-quantifier interactions. To the extent that it can be shown that the cases with lo do not involve movement, there is good evidence from Spanish clitic-doubling showing that PL-readings in fact diagnose successive cyclicity with a certain degree of success. In the following section, I consider evidence suggesting that the present hypothesis is on the right track.

1.2.4.1. *Lo* and the Matching Principle (MP).

In the previous section, I presented the suggesting that in questions involving the clitic lo, the clitic is not doubled by the wh-phrase, but by a null resumptive pronoun. The proposal also assumes that in questions with the dative clitic le, the wh-phrase is in fact the associate of the clitic. Thus, only questions with latter clitic involve successive cyclic movement under the present analysis. This approach then agrees with the approaches in discussed in sections 1.2.3.1-1.2.3.4: extraction is not possible with lo because a wh-phrase cannot double the clitic in the first place. The present analysis then disagrees with Suñer's (1988) account in assuming a fundamental distinction between the dative and accusative clitic, but agrees with hers with respect to the claim that there is a *matching*

requirement between a clitic and its associate. The feature involved in the matching requirement of the clitic lo, however, is different Suñer's approach and the present one: for her the relevant feature is the specificity of the associate, for the present analysis what matters is the referentiality of the phrase doubling the clitic. Let us consider evidence that can help us settle these discrepancies. Recall now the examples that Suñer gives in (47)-(48), repeated for convenience, in order to argue for the [+ specific] feature of partitive quantificational phrases.

(47) a. (*Lo) Entrevistaron a cada cadidato por media hora.
himA-Interview-p-pl. to each candidate for half an hour.
'They interview each candidate for half an hour'
b. (*Los) Entrevistaron a muchos/varios candidatos.
himA-Interview-p-pl. to many/several candidates
'They interview many/several candidates.'

(48) El médico los examino a cada uno/varios/muchos de los pacientes.
the physician themA-examine-p-s. to each one/several/many of the patients
The physician examined each/several/many of the patients.

Recall that her account of this contrast is that the quantifier phrase in (47) is not a partitive and that, therefore, it is not specific enough to double the clitic lo. By contrast the object quantificational phrases in (48) are partitives containing a definite NP. The assumption here is that the [+ specific] feature of the definite NP percolates all the way to the entire phrase, and therefore satisfies the matching requirement with the clitic.

I first want to say that even if account in terms of partitivity is right, I can maintain mine, mutatis mutandis, since partitivity has been argued by many researchers to help resumption (see for instance Aoun and Choueri 1999). There is evidence, however, showing that the partitivity account cannot be correct. There insertion contexts in Spanish, tell us that the [+specific], or [+ definite] feature of the definite NP in a partitive phrase do not project all the way to the entire phrase, or else the following sentences should all be unacceptable.

(58) a. Hay [varios de **los candidatos**] en la sala
have several of the candidates in the living room
'There are several candidates in the living room'
b. Hay [muchos de **los candidatos**] en la sala
have many of the candidates in the living room
'There are many candidates in the living room'

(59) *Hay **los candidatos** en la sala
have the candidates in the living room
'There are the candidates in the living room'

The sentence in (59) is meant as a control example, it shows that the definite phrase *los candidatos* 'the candidates' triggers a *definiteness effect* (DE) when occurring in the Spanish equivalent to the there-insertion construction. If the [+ specific] or definite feature of that DP percolated to the level of the bracketed constituents in the examples in (58), as assumed by Suñer, those examples would be unacceptable contrary to facts. Here one should notice that the DE leads us to the opposite conclusion of what Suñer assumes for the contrast in (47)-(48): the quantificational phrase *cada candidato* 'each candidate' in (47) is more definite (i.e. specific) than the phrases *varios de los candidatos* 'several of the candidates', and *muchos de los candidatos* 'many of the candidates' in (48), despite the fact that only the latter are partitives. This conclusion is enforced upon us by the ungrammaticality of (60) as contrasted with the acceptability of (58):

(60) *Hay cada candidato en la sala
have each candidate in the living room
'There's each candidate in the living room'

Suñer's hypothesis meets yet another obstacle in the following contrast:

(61) a. Hay [agua de **la playa**] en la mesa

have water of the beach on the table

'There's water from the beach on the table'

b. *Hay [el jabón de **miel**] en la mesa

have the soap of honey on the table

'There's the honey soap on the table'

c. Hay **miel** en la mesa

have honey on the table

'There's honey on the table'

Here our control sentence is (61c), which shows that a bare mass noun like *miel* 'honey' does not trigger the DE as expected. Sentence (61a) shows what we already saw in the examples in (58): that the definiteness of a definite NP in a partitive phrase does not percolate to the entire phrase. The example in (61b), shows what (61a) shows, but in the opposite direction: the indefiniteness of a bare noun inside a partitive phrase does not percolate to the top thereby defusing the definiteness of a containing definite NP.

Taken together, these facts leave the partitivity hypothesis without empirical content, and a different explanation must therefore be sought to handle the contrast in (47)-(48). What should the explanation be? Recall that, as hinted at the end of section 1.2.3.5, if one ignores plurality there's no contrast between the sentences in (47)-(48), as shown by the ungrammaticality of (49), repeated below.

(49) *El médico lo examino a cada uno de los pacientes.

the physician themA-examine-p-s. to each one of the patients

'The physician examined each of the patients'.

The unacceptability of this sentence cannot be attributed to a mismatch in number features between the clitic and its associates, since partitives like the one in (49) agree with the verb in the singular when occurring in subject position as we already saw when we considered (50):

(50) Cada uno de los estudiantes vino/?*vinieron

each on of the students come-p-s./come-p-pl.

'each of the students came.'

So why should plurality matter? Before offering any suggestion concerning this question I need to clarify some assumptions regarding the structure of examples like (49). It is possible to assume that even in these examples the clitic is doubled by a null resumptive pronoun, and not by the post-verbal quantificational NP. Under this analysis the NP must be in some position at the right periphery of the clause. Exactly the same structure is proposed by Aoun (1981) for River Plate Spanish. I will assume here that examples like (49) require positing this structure in all dialects of Spanish.

The question of why plurality matters is related to the question of why the example in (49) is unacceptable when the singular clitic has been used, so let me begin with the latter question first in the hope that the process will give us some insights for answering the former question. Assuming the structure sketched in the preceding paragraph for examples like (49), one possible reason why the example is ungrammatical is that from its position on the right periphery of the clause, the post-verbal NP cannot bind the pronoun. This can be the consequence of the fact that resumptive pronouns often resist binding of a very local nature, being sometimes subject to so-called anti-subjacency requirements: their binders may not be "too close" in some languages.

In section, I will discuss data showing that a wh-phrase in a chain with the clitic *lo* must be separated from that clitic by at least one CP node, which will show that constructions with *lo* are, in fact, subject to an anti-subjacency requirement. I will therefore hypothesize here, returning to the point in section ??, that the reason why (49) is ungrammtical is because the NP cannot bind the resumptive pronoun as it is too close to it.

One can now return to the question of why the plurality of the clitic seems to make a difference. Under the hypothesis just presented, if the plural feature restores the grammaticality of the relevant examples, e.g. by turning (49) into (48), it must be because plurality makes an interpretation other than variable binding available for the pronoun in that example. That is, if the previous hypothesis is on the right track, the pronoun in (48) must be related to the post-verbal NP by a mechanism other than variable binding. This is

possible for instance if a plural pronoun can be interpreted as a referential entity of type e, which then can independently be associated with a plural *discourse referent* somehow made salient by a plural quantificational NP. Notice that this analysis assumes that when regular c-command variable-binding fails, between a quantifier and a pronoun, adding the plural feature to the pronoun should restore grammaticality. Evans (1980), discusses examples that seem to show that the assumption is warranted. Consider his example below:

(62) John owns **some sheep** and Harry vaccinates **them**.

Evans (1980) shows that the pronoun *them* in (62) cannot have a bound-variable interpretation. The sentence does not mean that there are some sheep that John owns and Harry vaccinates as that reading is compatible with a situation in which Harry only vaccinates a subset of John's sheep.

Intuitively, (62) is true only if Harry vaccinates all the sheep that John owns. The right meaning for the sentence is captured if *them* in (62) means something like *the sheep that John owns;* i.e. it is analyzed as a disguised definite description. This is known in the literature as the E-type strategy for interpreting pronouns. Notice that in these type of contexts. If one takes away the plural feature from the pronoun, the result is ungrammaticality:

(63) a. *John owns **every ship in town** and Harry vaccinates **it** every week.
b. John owns **every ship in town** and Harry vaccinates **them** every week.

Evans discusses other examples that, in my opinion, bring out the distinction between singular and plural pronouns with even more strength. Consider the following pairs, which are modifications of Evan's examples:

(64) a. A boy who owned **them** ran down **each of the white sheep** that were in his way.
b. *A boy who owned **it** ran down **each of the white sheep** that were in his way.

(65) a. A man who owned **them** burned down **every car** there was in his house
b. *A man who owned **it** burned down **every car** there was in his house.

Evans uses examples like (64) and (65) to demonstrate his points that at least some contexts pronouns cannot have a bound variable interpretation. These sentences are cases of crossed-anaphora in which each quantifier binds a variable in the restriction of the other. If one assumes with Barrwise and Cooper (1981) that quantification in natural language is restricted, there is no way for deriving a LF in which all the pronouns end up bound. From considerations like this, Evans draws the conclusion that the plural pronouns in sentences like (64)-(65) are interpreted via the E-type strategy, being in no sense bound variable. Notice again that in these cases, where variable binding is not possible, the anaphoric relation with a universal quantifier requires a plural pronoun and not a singular one as the ungrammaticality of b-sentences in (64) and (65) shows.

Notice that given my hypothesis that binding is impossible in examples like (48)-(49), the situation becomes entirely parallel to the Evans' facts just discussed: where binding is impossible, anaphoric relation to a universal/plural NP requires a plural pronoun. Given this parallelism I will assume that the hypothesis just sketched is on the right track: the clitic *lo* is always doubled by null resumptive pronoun and never by a quantificational phrase. In the next section, I will discuss data involving the distribution of wh in situ in Spanish, that will corroborate this conclusion.

1.2.4.2. Wh in Situ in Spanish: An Asymmetry in Clitic Doubling.

Unlike the examples in (48)-(49) where *lo* appears to be doubled by a quantificational phrase, a construction in which this clitic co-occurs with a *wh*-in situ is ungrammatical.

(66) ¿Que mujer cree que María (* **lo**) denunció **a quien**?
which woman believes that M. him-denounced to whom
'Which woman believes that M. denounced whom?'

(67) ¿Que mujer cree que María (*__lo__) denunció **a cuál hombre**?
which woman believes that M. him-denounced to which man
'Which woman believes that M. denounced which man?'

In Spanish multiple questions, just like in English, only one *wh*-phrase is fronted and the remaining ones must be pronounced in situ. The examples in (66)-(67), show that the accusative clitic *lo* cannot co occur the in situ wh-phrases. For those questions to be asked, the pronoun need to be dropped. This, however, contrasts sharply with the situation concerning the dative clitic le, which can be doubled by a wh in situ with no consequences for the grammaticality of the question.

(68) ¿Que mujer dijo que María **le** pego **a quien**?
which woman said that M. himD-hit to whom
'Which woman said that M. hit whom?'

(69) ¿Que mujer dijo que Maria **le** pego **a cual hombre**?
which woman said that M. himD-hit to which man
'Which woman said that M. hit whom?'

The ungrammaticality of examples like (66)-(67), in which *lo* co-occurs with a wh in situ cannot be restored by using a partitive wh-phrase, as in (70) and (72), or by both using partitivity and a plural clitic pronoun as in (71):

(70) ¿Quién (*__lo__) denunció **a cuál de los dos candidatos**?
who him–denounced to which of the two candidates
'Who denounced which of the two candidates?'

(71) ¿Quién (*__las__) denunció **a cuantas de ellas**?
who them denounced to how many of them
'Who denounced how many of them?

(72) ¿Quién (*lo) eligió **a cuál de los candidatos**?.
who him-elected to which of the candidates
'Who elected which of the candidates?'

Taken together, the examples in (66)-(72) reveal an interesting asymmetry that has hitherto been unnoticed: clitic doubling with *wh*-in situ is possible with the dative clitic, but not with the accusative one. The reader should notice now that the ungrammaticality of (70)-(72) is very surprising under Suñer's (1988) hypothesis that partitive phrases match the [+specific] feature of the accusative clitic by letting the feature of the definite NP, inside the partitive DP, percolate to the entire phrase. If that hypothesis were correct, the relevant examples should be grammatical contrary to what is attested. Notice also that the fact that the plurality of the clitic does not help here contrast with what we saw in the contrast between (48) and (49), which I now modify to yield (73).

(73) El médico lo*(s) examinó a cada uno de los pacientes.
the physician themA-examine-p-s. to each one of the patients
'The physician examined each of the patients'.

As we saw before, the plural morpheme -s makes a difference in the example in (73), = (49): a plural accusative clitic can co-occur with what looks like a partitive quantificational phrase in situ, but the singular version of the pronoun cannot. In section 1.2.4.1, I concluded that the partitive phrase in this case is not the clitic associate. Rather there is a resumptive pronoun doubling the accusative clitic ant the quantificational NP is in some position at the right edge of the VP or the clause. The ungrammaticality of (73), when the plural feature is not present, was attributed to the impossibility of binding in that case. The grammaticality of the example using the plural version of the clitic was attributed to the pronoun not getting a bound-variable interpretation. Consequently, the anaphoric relationship of the pronoun with the post-verbal NP, whatever it is (e.g., the E-type strategy), is not subject to configurational requirements.

The question then is why plurality does not help in the examples in (70)-(72). A possibility here, and now we are entering speculative territories, is that whereas univeral NPs in partitives may be analyzed sematically as plural definite descriptions with a distributive feature, partitive wh-phrases cannot be analyzed in such a way given their interrogative operator status. Thus, for instance, the partitive universal NP in (74a) can be paraphrased as in (74b), but there is no corresponding paraphrases for the partitive wh-phrase in (75).

(74) a. Each one of the students came
b. The students each came.

(75) Which one of the students came?

Given this difference one may speculate that when the universal in (74a) is understood in terms of the paraphrase in (74b), it sets up a discourse referent associated with the maximal collection of individuals in the extension of the plural predicate *students*. That discourse referent might them be picked up by a plural pronoun. One may then argue that since a similar paraphrase is not available for the wh-phrase, it will not be able to set up a discourse referent in similar fashion and so a pronoun will only be able to relate with the wh-phrase through binding.

Something along these lines might well be on the right track, but this is clearly an area demanding a more rigorous investigation than the one I can afford to give it here, and I'll to leave this issue for future research to settle. I take it that the main point of this section is unaffected by my dropping this last issue: the examples in (70)-(74) show that lo cannot be doubled by a wh in situ. Under the assumption that a wh pronounced in situ signals the position in which it was merged, these examples show that wh-phrases are never merged as the associates of the clitic *lo*. The only way then for a wh-phrase to end up in a chain with the relevant clitic, is by being merge in COMP and binding a resumptive pronoun doubling the clitic as I already suggested before.

In the next section, I will discuss evidence showing that the ungrammticality of mono-clausal questions with the accusative clitic is due to an anti-subjacency requirement, as is usually the case with resumptive pronouns.

1.2.4.3. Anti-subjacency with the Accusative Clitic.

Suñer (1988) discusses clitic doubling constructions in constructions other than constituent questions as evidence of her *Matching Principle*. Consider the following examples involving relativization and topicalization respectively.

(76) *María, a quien **la**-he visto ayer, estaba muy preocupada
M., to whom herA have-1p seen yesterday, was very worried
María, whom I have seen her yesterday, was very worried.

(77) *Es a Mara/ella a quien **la** operaron.
is to Mara/ she to whom herA-operate-p-pl.
It is Mara/she whom they operated on.

Suñer's explanation is that the examples in (76)-(77) are unacceptable because the *wh*-operator in these constructions is not specific, failing therefore to match the [+ specific] feature of the clitic. However, there's evidence suggesting that the problem here is the distance between the clitic and the A'-operator: examples where one separated the *wh*-operator and the clitic so that they are not clause-mates become acceptable:

(78) María, a quien Pedro no sabia que ya **la**-habia convencido
M., to whom P. not knew that already herA have-1ps convinced
estaba incrédula
was sceptic
'María, whom Pedro did not know that I had already convinced her, was sceptic.'

(79) Es a Mara, que Pedro lamenta que **la** hayan operado.

is to Mara, that P. regrets that herA-have3p-pl operated

'It is Mara, that Pedro regrets that they operated on.'

These examples show that the accusative clitic is subject to an anti-subjacency requirement of some sort. The difference between (76)-(77), on the one hand, and (78)-(79), on the other, is that in the latter examples the clitic is separated from the *wh*-operator by at least one CP node. Under the hypothesis that the clitic is doubled by a resumptive pronoun, these facts are not surprising since similar requirements have been reported for resumptive pronouns in other languages.

Under the resumptive analysis of the accusative clitic, the *wh*-operator must be at a certain distance from the resumptive pronoun doubling the clitic, rather than the clitic itself. I suggest that the relevant distance is two phases in the sense of Chomsky (2000), but nothing in this is crucial to the present discussion. What is important for the proposal at hand, is that the examples in (78)-(79) show that the clitic and its associate may not be too close to the *wh*-operator in a *wh*-construction involving the clitic *lo*, but that the construction is fine otherwise, suggesting that we are indeed dealing with resumption here. In the next section, I will discuss more evidence confirming the hypothesis, that in *wh*-constructions with the accusative clitic, the doubling NP is a null resumptive pronoun.

1.2.4.4. Wh-constructions, The Accusative Clitic, and Strong Islands.

In section 1.2.4.2, we saw that the accusative clitic cannot co-occur with a *wh*-phrase in situ, as opposed to the dative clitic. I took that fact to indicate that the *wh*-phrase is never merged as the associate of the accusative clitic, contrary to what happens in the case of the dative clitic le. Given such facts, I concluded in that section that the only way for the *wh*-phrase to be in a chain with the accusative clitic, would be through the binding of a resumptive pronoun doubling the clitic. In the previous section, we saw that constructions involving accusative lo, are subject to an anti-subjacency requirement; which is characteristic of resumption, but not of clitic doubling. In this section I will consider evidence of a different sort, showing that *wh*-constructions with *lo* violate strong islands. Consider the following examples.

(80) **A cual dictador** piensas que [de la corte enjuiciar-**lo**]
to which dictator think-2ps that of the court prosecute-himA
saldría en primera plana
come out-cond-3p. on first page.
'Which dictator do you think that if the court prosecutes him, it will make the front page'.

(81) ¿**Cual auto** dijo Pedro que [si el mecanico **lo**-repara], todos estaran felíces?
which car said P. that if the mechanic itA-fix, everyone be-F.-pl happy
'Which car did Pedro say that if the Mechanic fix it, everyone will be happy'

In each of these examples, the accusative clitic is located inside a constituent that qualifies as a strong island: the infinitival subject *enjuiciar* 'prosecuting' in (80), and the preposed if-clause in (81). Both types of environments are considered strong islands (see e.g. Cinque 1990, Postal 1998, and Szabolcsi 1999). The strong island status of these environments in Spanish is demonstrated by the fact that "pure extraction", i.e. a construction in which the *wh*-phrase is related to a gap and not to a clitic, is ungrammatical:

(82) ?***A cual dictador** piensas que [de la corte enjuiciar__]
to which dictator think-2ps that of the court prosecute__
saldría en primera plana
come out-cond-3p. on first page.
'Which dictator do you think that if the court prosecutes, it will make the front page'.

(83) *¿**Cual auto** dijo Pedro que [si el mecánico repara__], todos estaran felíces?
which car said P. that if the mechanic fix__, everyone be-F.-pl happy
'Which car did Pedro say that if the Mechanic fix it, everyone will be happy'

(82)-(83) show that extraction out of the bracketed constituents in those examples is ungrammatical, as is always the case with strong islands. This being the case, it is not plausible to assume that the dependencies in (80)-(81) arise via movement of the *wh*-phrase to the COMP position. Again, the only plausible alternative in this case, is that the *wh*-phrase has been base-generated in the COMP position and is binding a resumptive pronoun doubling the accusative clitic inside the islands.

Wh-constructions with *le* are also possible across a strong islands as shown in (84) below.

(84) ¿**A Cual auto** cree Pedro que [del mecánico reparar-le una puerta], todos
to *which car believes P that of-the mechani fix-itD a door everyone*
estaran felíces?
be-F.-pl happy-pl
'Which car does Pedro think that if the mechanic fix a door on it,
everyone will be happy?'

This is not a problem, however, if doubling with the resumptive pronoun strategy is available in the language, one expects the language to use it whenever possible. I will assume with Sells (1984) that the resumptive strategy has a last resort flavor to it. That is, if normal extraction is possible, the resumptive strategy is never chosen. On the other hand, if extraction is not possible, the resumptive strategy will be available.

With these assumptions in place, it is plausible that the grammaticality in (84) is due to the presence of a null resumptive pronoun as extraction from that position is impossible given the strong island in the construction. When no strong island is involved, however, extraction of a *wh*-phrase from the position in which it is merged, doubling the dative clitic, will take precedence over the resumptive strategy. This analysis predicts, that only in cases involving strong islands, should constructions with the dative clitic, pattern with those involving accusative *lo*. When we look at the interpretation of constructions with *le* spanning a strong island, we find that this prediction is borne out:

(85) A cual coche piensa pedro que de cada mecanico reparar-le algo,
to which car thinks P. that of each mechanic himD-fix something
iremos a NY.
go-F-1p-pl to NY.
'Which car does Pedro thinks that if each mechanic fix something on it,
we will go to NY'

*(SA, *PL, *CR)*

(86) A cual coche piensa cada mecanico que de Pedro reparar-le algo,
to which car thinks each mechanic that of P. fix-himD something
iremos a NY.
go-F-1p-pl to NY.
'Which car does each mechanic thinks that if Pedro fix something on it,
we will go to NY'

*(SA, *PL, *CR)*

These judgments are subtle, but it seems to me that the single individual reading is the only interpretation that the pair of sentences in (85)-(86) allow felicitously. (86), for instance can only be answered with the Spanish equivalent of the English answer in (87a), but not with the equivalents of the answers in (87b-c).

(87) a. This car *(single answer)*
b. Mechanic A thinks that if Pedro fixes the blue car, will go to NY; Mechanic B thinks that if Pedro fixes the red car, will go to NY; ... *(Pair-list)*
c. A second-hand car. *(Concept Reading)*

Recall now that this is what we find for constructions with *lo* in normal sentences not involving islands, and unlike what we find with the dative clitic in such cases. These data taken together then strongly confirm the truth of the hypothesis that we originally set out with on the basis of the distribution of PL-readings in *wh*-constructions with clitics in Spanish: that the constructions involving *lo* involve resumption, but that the one

involving the dative clitic *le* does not, at least for wh-dependencies not spanning strong islands. Here we have identified an area in which using PL-readings as a diagnostic for cyclicity has helped us characterize a phenomenon that has puzzled researchers working on the syntax of Spanish for a long time. Findings like this provide empirical content to the reconstruction view of scope ambiguity in *wh*-quantifier interaction as defended in this dissertation.

1.3. Interim Summary.

In sections 1.1-1.1.1 we saw that the distribution of PL-readings in questions with quantifiers, suggest that there are intermediate landing sites used by wh-movement on its way to the COMP position. In particular, we saw that the availability of PL-interpretations in certain sentences require positing a position for reconstruction below the subject of the sentence and above the VP phrase. We concluded in those sections that the relevant position is the vP phase in the sense of Chomsky (2000). We then considered what could be counted as independent syntactic evidence for the vP phase, of a sort hitherto unavailable, from the phenomenon of men-deletion in Indonesian.

In sections 1.2-1.2.2, resumptive chains were discussed. The conclusion from those sections was that the vP phase is not used in resumptive chains as an intermediate site for wh-movement which suggest that such chains are not the result of successive cyclic movement, but rather involve *external merge* (base generation) of the wh-phrase in COMP. In sections 1.2.3-1.2.4.4, we saw that wh-constructions with quantifiers involving clitic doubling of the clitic *le* 'him-dative' are scopally ambiguous, whereas wh-constructions with the clitic *lo* are scopally unambiguous. Given the reconstruction view of PL-readings, such a result is only possible if the wh-phrase has not passed through the intermediate sites, e.g., the vP phase, inside the clause.

The conclusion from those facts was that the wh-phrase in a construction with lo is in fact heading a resumptive chain, with the tail of the chain (i.e. the null pronoun) being the NP actually doubling the clitic. We saw that all the evidence discussed throughout those sections support that conclusion. In the next section I will use the

findings discovered so far to propose a particular explanation for Longobardi's observation (LO) introduced before.

1.4. Longobardi's Observation and the Selectivity of Weak Islands.

As it pertains to PL-interpretations, LO is the discovery that questions with quantifiers, where extraction has proceeded from inside a weak island, do not allow a PL-interpretation if the quantifier c-commanding the *wh*-trace is contained within the island. The following examples exemplify the observation.

(88) a. Which (particular) problem do you wonder [whether every student solved]?
(*SA*, **PL*)

b. Who do you [regret that every student helped] (*SA*, **PL*)

c. Which problem did you denied that every student solved (*SA*, **PL*)

The question here is how we can explain the fact that the PL-interpretation is not possible in these examples. A possibility that suggests itself here is that the absence of the PL-interpretation in WI contexts, is related to the selective nature of such environments. It is, by now, becoming a well known fact that WIs only allow extraction of operators that quantify over individuals[7]. Consider the following examples.

(89) a. *How did John ask [which problem to phrase__]?

b. *Why did John ask [whether Mary left__]?

c. *How many pounds do you wonder [whether Tyson will weight__]
for his next fight?

d. *How ignorant do you [regret that the mob is __]

e. * What kind of vice president do you wonder [whether the president needs__]?

f. *What did John ask [whether these pearls cost __?]

[7] There's a considerable amount of research converging on this conclusion. See for instance, Frampton (1990), Szabolcsi and Zwarts (1993, 1997), Cresti (1995), Honcoop (1999), among others.

These examples show that operators quantifying over manners (89a), reasons (89b), amounts (89c), degree (89d), etc., cannot be extracted out of a WI, for some not very well understood reason. Whatever constraints are involved here seems to have a semantic flavor to it, given that the range of unacceptable cases span the argument/adjunct asymmetry originally believed by Huang (1982), Lasnik and Saito (1984), and Chomsky (1986) to characterize, respectively, the classes of good and bad extracteés. This has become clearer after the work of Rizzi (1990) and Cinque (1990) who show that wh-phrases that are syntactic arguments fail to extract out of a WI when they are *non-referential*. Such is the case for instance of the fronted phrase in (89c), which must be introduced as an argument of the verb *weight*, as demonstrated by the fact that this verb obligatorily requires a complement DP:

(90) *Tyson will definitely weight for his next fight.

The fact that (88c) is unacceptable shows that it is not the argument/adjunct status of the *wh*-phrase that matters, but rather whether the wh-dependency is referential or not. That is, whether the *wh*-phrase quantifies over individuals or not. Let us state this generalization informally as in (91) (c.f. Frampton 1990, Cresti 1995).

(91) Only *wh*-dependencies involving quantification over individuals can span a WI.

Now when one moves to consider wh-phrases like those in (88) one finds that the result of extracting the *wh*-phrase out of a WI is acceptable, but only under the single individual reading. The PL-interpretation which is normally possible in the absence of WI is missing. Under the approach defended in this dissertation in which PL-interpretations involve quantification over functions, the absence of the relevant reading falls under whatever is behind the generalization given in (91): PL readings are not possible in WI because PL-readings do not involve quantification over individuals which is the only type of quantification allowed to span a WI. That is, under the PL-interpretation of a question, the wh-phrase is semantically like those in (89) although

superficially it may not look so. I will assume that something alone these lines is in fact the right characterization of the absence of PL-interpretation in WI context.

The question that emerges now is how do we interpret the copies inside the WI so that the sentence can at least be interpreted. Here a mechanism that suggests itself is to interpret the copies inside the WI using Fox's (2001) mechanism of trace conversion, which we already introduced in chapter 2, section 2.9. Thus for instance, in (88a), the lowest copy of *which particular problem* will get turned into *the particular problem x* by trace conversion. Notice however, that since we are positing cyclic movement, and there is a cyclic node outside the WI, namely the matrix vP phrase, our analysis predicts that placing a quantifier in the subject position of the matrix clause will make PL-readings possible. This expectation is borne out. The sentences in (92) are ambiguous unlike those in (88).

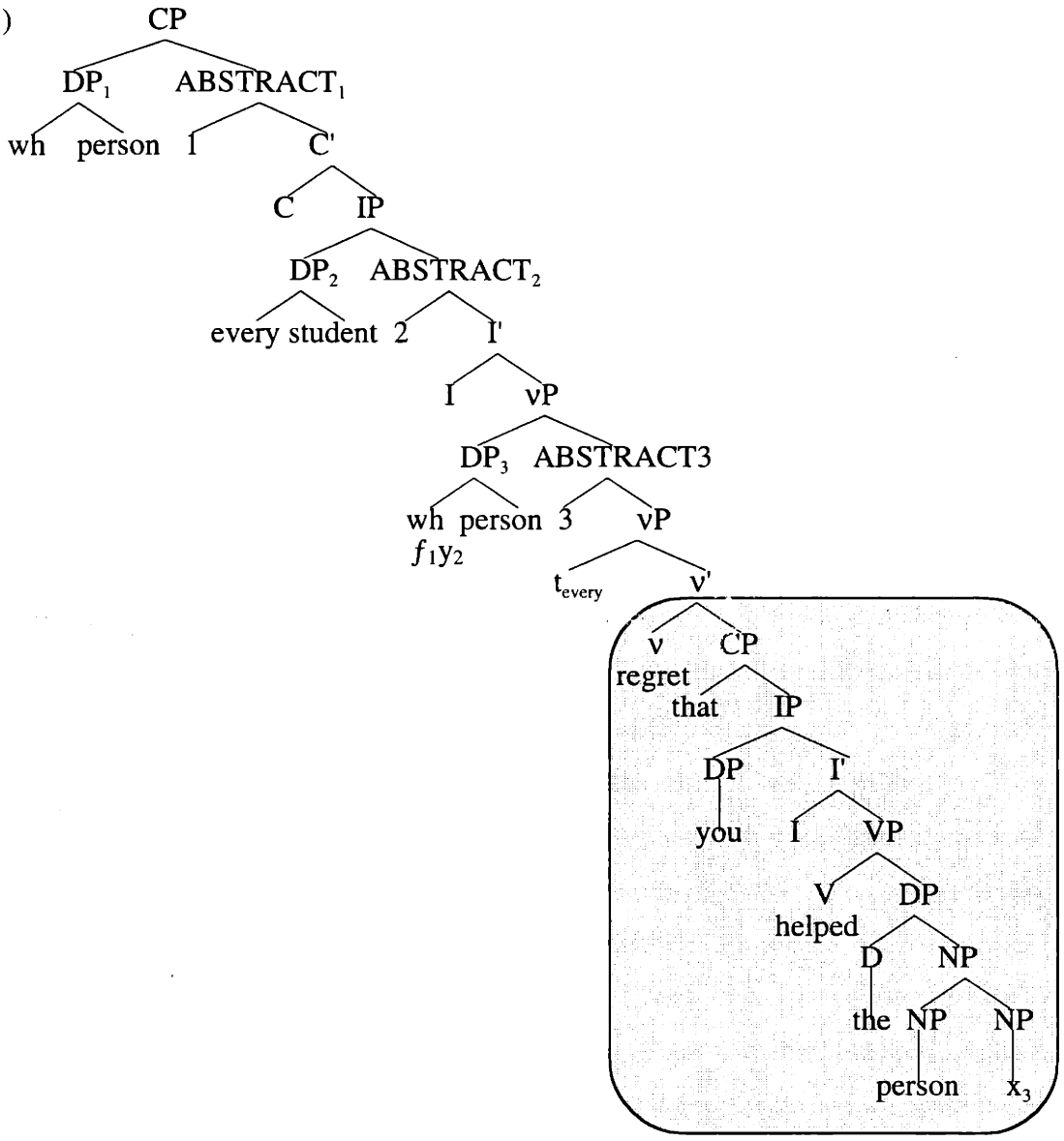
(92) a. Which (particular) problem does every student wonder [whether to solve__]?
(*SA, PL*)

b. Who does every student [regret that you helped __] (*SA, PL*)

c. Which problem did every student [denied that you solved __] (*SA, PL*)

All the sentences in (92) allow a PL-interpretation. Notice that in this case, the PL-reading is an intermediate reading in that it involves interpreting the copy of the *wh*-phrase that lies outside the WI, but below the quantifier in subject position of the matrix clause. This result is possible because *wh*-movement, does not proceed from COMP to COMP, as it was believed at some point in the early eighties, but rather it proceeds from cycle to cycle, where the relevant cycles are vPs and CPs as in Chomsky (2000, 2001). A question that arises now is how is the PL-interpretation of examples like (92), obtained if quantification over function is not allowed inside the bracketed constituents in (92). The answer is that quantification over function takes place in the matrix clause, but that quantification over individual takes place inside the island. Consider the LF associated with (92b):

(93)



The domain in which quantification over function is not allowed in (93), appears enclosed in a vertical rounded rectangle. Notice that the result of trace conversion transforms the lowest copy of the *wh*-phrase into the sequence the person x. The variable x is an individual variable and is bound by the lambda abstract created by the copy of the

wh-phrase in the outer spec of the matrix vP. This mean that quantification into the WI is quantification over individuals as required in keeping with the generalization in (91). The wh determiner in the wh-copy in the matrix vP is analyzed as contributing two variables: an individual variable bound by the subject in the matrix clause, and a choice function variable bound from the COMP position by the wh-operator there. The node DP_3 in (93) will get reconstructed all the way to the position of the individual variable in the trace-converted copy, but only through lambda conversion in the semantics. What we have in (93) is a combination of quantification over individual inside the WI, with quantification over function outside the WI. The result of this combination is that PL-interpretations are absent inside WI, but are present in intermediate positions.

The availability of intermediate PL-interpretations, allow us to rule out certain hypothesis concerning the selective nature of WIs. Thus, for instance, the basic idea concerning the distinction between good vs bad extracteés entertained in Obenauer (1984), Cinque (1990) and Manzini (1998) is that wh-phrases in the former class can extract out of a WI because the empty category associated with those wh-phrases is a null resumptive pronoun, and so the wh-phrase can simply be merged in COMP in those circumstances. Under this idea, only wh-phrases that quantify over individuals are expected to violate islands, because resumptive pronouns are individual variables semantically. That is, in natural languages pronouns are of type e; the type of individuals, and as such there are no resumptive pronouns corresponding to degrees, manners, reasons, and the like. As a consequence of this idea, if follows that adjuncts like how, why and degree phrases will not be able to participate in wh-dependencies accross a WI, as the empty category inside theWI can only be the trace of movement.

However attractive this hypothesis may be, intermediate PL-readings tell us that the idea cannot be correct. In sections 1.1-1.4, we saw that resumptive chains do not interact scopally with a quantifier in the question: the wh-phrase always take maximal scope. If the wh-phrases in (92) were merged in COMP, as the resumptive analysis would require, there will be no copy of the wh-phrase below the quantifier, and we saw that in such circumstances the PL-interpretation is missing. The availability of PL-readings for the sentences in (92), thus, leads us to the conclusion that wh-phrases in such cases gets to the COMP position via successive cyclic movement, using, in particular, the matrix vP

position. There's no distinction between good and bad extracteés with respect to the type of strategy involved in deriving wh-dependencies. Rather, the distinction seems to be semantic as characterized in the generalization in (91).

Let me return now to the question of how it is possible for BT reconstruction effects to take place without forcing scope reconstruction. A question that I raised in chapter 2, section 1.5, but was not in a position to answer. The structure in (93) allows us to give a plausible answer to the question. Scope reconstruction is impossible down WIs because it involves quantification over entities of a type other than the basic type of individuals. However, BT reconstruction is possible. Trace conversion only replaces the determiner of the copy inside the island and insert an individual variable. Other material that is part of the original copy remains after trace conversion. Thus, had there been a reflexive inside the restriction of the fronted phrase in (93), it would have also been inside the restriction of the trace-converted copy in object position of the verb. This is the reason why binding theory can take place without forcing scope reconstruction, whereas scope reconstruction does trigger BT reconstruction effects.

1.5. Summary to Part 1.

In the first part of this chapter, we saw that PL-readings can help us find intermediate positions that are taken to constitute intermediate landing sites for overt wh-movement. In particular, we saw that overt extraction always seems to target a position above the VP and below the subject of the clause. I have concluded that the relevant position is the vP in the sense of Chomsky (2001a, 2001b). We saw when wh-movement is extracted from an island, there are PL-readings if there is a universal quantifier in the subject position of the clause containing the island.

Under the reconstruction view of PL-reading defended here, and given Longobardi's observation, this means that the wh-phrase must be reconstructed to a position below the subject of the matrix clause and above the island. I concluded that the relevant position is the matrix vP, suggested that there appears to be syntactic evidence from Indonesian giving plausibility to the hypothesis that the relevant position is in fact the matrix vP. We also saw that questions involving resumptive chains are unambiguous

allowing only single answers. Using PL-readings as a diagnostic for cyclicity, I concluded that in those cases the wh-phrase is merged in COMP, and cannot, therefore, be reconstructed below the quantifier in the sentence. In such constructions the reconstruction view of wh-quantifier interaction makes the right prediction, unlike approaches that treat the relevant phenomenon in terms of quantifying in. Applying then the insight about the scopal properties of resumptive chains, I concluded that in the Spanish clitic doubling phenomenon, wh-dependencies with *lo* involve a null resumptive pronoun doubling the clitic whereas those with the dative clitic le, are real cases of doubling in which the wh-phrase itself is the associate of the clitic. It was shown, that as expected from the distribution of PL-readings in these constructions, sentences with le exhibit the properties of successive cyclic movement, whereas those with *lo* do not. In part two of this chapter, I will discuss certain differences between overt wh-movement, and wh in situ. It will be shown that only the first strategy seems to have the properties of successive cyclicity when we look at the availability of PL-readings in similar contexts in both strategies of interrogation.

2.0. Asymmetries Between Overt Wh-movement and Wh in situ.

Bakers (1970) observed that questions like (94) are ambiguous between a reading in which the embedded wh-phrase takes scope with *where* in the embedded clause, and a reading in which it takes matrix scope.

(94) **Who** remembers **where** we bought **what**?

When *what* in (94) takes embedded scope with *where*, the sentence is interpreted as a matrix single question allowing an answer as in (95a). On the other hand, when *what* takes scope with *who* in the matrix clause the sentence is interpreted as a matrix multiple question and the answer corresponding to the question is the one in (95b). Parenthesis indicate possibly elided material.

(95) a. Bill (remembers where we bought what).

b. Bill remembers where we bought the radio, and Jane remembers where we bought the TV.

Baker assumed that the *wh*-phrase in situ in sentences like (95) was assigned wide scope without movement. In particular he assumed that the *wh*-phrase in situ, in examples like (94) can be bound by what he called the *Q-morpheme*, equivalent to a [+wh] C^0 head in contemporary transformational syntax. In the optimism of the *QR-at-LF* view of scope assignment, for quantifiers pronounced in situ, developing in the early eighties, it was soon proposed that *wh*-phrases in situ get their scope in the same way in which overtly displaced wh-phrases do: via movement[8]. It was soon noticed, however, that the method by which wh in situ take scope does not seem, at least on the surface, to be subject to the same syntactic constraints as overt movement is. The relevant evidence involve island constraints exemplified in the following pairs of sentences from Huang et al. (1988).

(96) a. *Who do you like books that criticize__?
b. Who likes books that criticize who?

(97) a. *Who do you think that pictures of__ are on sale?
b. Who thinks that pictures of whom are on sale?

(98) a. *Who did you get jealous because I spoke to__?
b. Who got jealous because I spoke to whom?

(99) a. *Who did you see John and __?
b. ?Who saw John and who?

These examples show that extraction out of a complex noun phrase (96a), the subject of a tensed clause (97a), and adjunct clause (98a), and a coordinate structure (99a) leads to unacceptability. The b-sentences show, on the other hand, that in similar circumstances a

[8] Representative references of the literature of the time on this point are Higginbotham and May (1981), Huang (1981, 1982), Lasnik and Saito (1984), among others.

wh in situ is acceptable. Given that the *whs* in situ in these examples take scope in the same place where the overtly displaced *wh*-phrases lands in the a-sentences, the question is how we can explain this contrast.

Two main families of approaches have been developed over the past two decades in an attempt to explain the previous contrast. On the one hand, some approaches have maintained the hypothesis that wh in situ gets their scope via movement, and have therefore, tried to show that contrasts like the one in (96)-(99) do not indicate a difference in the movement properties of the relevant wh-phrases, but rather some other aspect of natural language grammar is responsible for the apparent differences. On the other hand, another family of analyses have interpreted the previous contrast as suggesting that wh in situ get their scope assigned without movement. I will refer to the first kind of approaches as *movement-based approaches*, and to the second type as *in situ theories*. I will discuss these two family of analyses only at the level of generality necessary to provide some background for the main point I will be making in subsequent sections regarding the nature of scope assignment to wh-phrases that are pronounced in situ.

2.1. Movement-based Approaches.

The first explicit and well defended movement-based approach to the scope assignment of *wh* in situ is that of Huang (1982) who showed that in Chinese, just like in English, *wh*-phrases display an adjunct-argument asymmetry: arguments can occur inside islands, but adjunct cannot. Huang's proposal is based on Chomsky's (1981) Empty Category Principle (ECP), according to which an empty category (EC) must be properly governed. Given the definition of proper government, argument extraction always satisfy the ECP, but the same is not true for adjuncts.

This being the case, extraction out of islands is possible for arguments but not for adjuncts, although the former type of extraction may under some circumstances be deviant depending on subjacency. Huang's proposal was that whs in situ move at LF to their scopal position, just like their overtly moved counterpart do. To get the contrast exemplified in the pairs of sentences in (96)-(99), Huang stipulated that the ECP holds at

LF, given that adjuncts inside islands are bad in Chinese just like adjunct-extraction from island is bad in English, but that LF movement is immune to Subjacency, given that arguments wh-phrases inside island can take wide scope freely and without any deviance, as in the b-sentences in (96)-(99).

However, Huang's proposal has not been related to any independent property of the grammar. That is, why the level of LF should differ from other syntactic levels in the way Huang suggests was never explained. In fact, the evidence examined in the works of Itô (1986), Cole (1987), Barss et. al (1991), and Longobardi (1991), showed that Subjacency constraints overt movement in other type of constructions in different languages. Thus, on the basis of both conceptual and empirical arguments researchers tried to remove Huang's stipulation that Subjacency does not apply at LF while defending a movement approach to the scope assignment of *wh-* phrases in situ. The contrast in (96)-(99), therefore, needed to be accounted for in an alternative way.

A proposal that enjoyed a certain degree of success along the previous lines is what came to be known as the LF pied-piping hypothesis defended in such works as Choe (1987), Pesetsky (1987), and Nishigauchi (1990). The idea behind this hypothesis is that LF movement somehow is allowed to pied-pipe bigger phrases than what overt movement can. When contained in an island, a *wh*-phrase is taken to pied-pipe the whole island at LF. Subjacency is not violated because the wh-phrase never leaves the island. Under this hypothesis, thus, Subjacency constrains both overt and covert movement. Except that massive pied-piping gives the impression that Subjacency is been violated. Interesting as the pied-piping hypothesis may be, Fiengo et al (1988) show that it doesn't really solve the problem. For one thing, not all islands are pied-pipable as shown by the fact that the criterion used as a test for pied-piping is not met. Second, there is evidence suggesting that even a complex NP, which is the paradigm of a pied-pipable island, are not affected by such massive movement. Consider the following.

(100) meige ren dou mai-le [yiben [shei xie del shu]?
every man all bought one who write REL book
'Everybody bought a book that who wrote?'

As Fiengo et. al (1988) point out, there are three quantificational noun phrases in (100) whose scope order under a natural reading is *who > everybody > a book that t* (who is the person x such that everybody bought one book or another that x wrote?). In this reading, it is clear that the *wh*-phrase does not form a constituent with the containing existential NP since these two quantificational phrases are separated in scope by the universal quantifier. But the pied-piping hypothesis predict that the wh-phrase and the containing NP should be a constituent at LF, and thus, both are expected to scope together either above or below the universal quantifier.

The last movement-based approach that I will quicky mention here is the proposal of Richards (1997). Richards argue that grammatical principles are themselves regulated by a second order principle: his *Principle of Minimal Compliance (PMC)*. Very roughly, the idea is that if an instance of movement satisfies a given principle, that principle can be turned off for subsequent instances of movement in the derivation. So for instance the contrast between the pairs of sentences in (96)-(99) is due, in Richards' theory to the fact that the b-examples contain a matrix *wh*-phrase that satisfies Subjacency. This being the case, the derivation is not evaluated with respect to whether movement of the *wh* in situ in the b-sentences violate Subjacency, since the "Subjacency tax" has already been paid by the matrix *wh*-phrase. Richards (1997, 1998) shows that the effects of the PMC are also found in other areas of the grammar of natural language. His approach succeeds in removing Huang's stipulation from a theory of covert movement for wh- in situ, without committing himself to the empirical prediction of the LF pied-piping hypothesis.

2.2. In situ Theories.

Baker (1970) solution to contrasts like the one in (96)-(99) was that *wh*-phrases in situ, unlike their moved counterparts, are bound in situ by the question morpheme from the COMP position and as such they are not expected to obey any movement constraint given that no movement is involved. Several variants of this approach have been defended over the years in order to adapt the approach to the finding of current research.

A representative modern variant is that of Pesetsky (1987) unselective binding approach, which I will not discuss here.

Whatever merits the unselective binding approach to wh in situ has, Reinhart (1992, 1994, 1997) shows that the approach faces some serious problems concerning the semantic interpretation of wh-phrases in situ. She proposes instead, as we already saw in chapter 2, that wh phrases in situ can be interpreted without movement, but not by the mechanism of unselective binding, as in Pesetsky (1987), but with the help of choice functions. The idea being that a *wh*-phrase can be interpreted by assuming that the *wh*-determiner provides a function variable applying to the denotation of the noun restrictor. The existential variable can be bound from arbitrarily far away. This predicts that *wh* in situ should take scope outside islands without any problem as long as existential closure provides and existential quantifier over functions outside the island. The result is equivalent to the result of moving the *wh*-phrase all the way to its scopal position but without having to posit unconstrained movement. In the next section I will consider an asymmetry that will lead to side with the in situ approaches concerning the debate of whether movement is involved in the scope taking of *whs* pronounced in situ.

2.3. Displaced Wh-phrases vs. Wh-phrases in Situ: A scope Asymmetry.

In this section, I will show that when one compares overtly displaced wh-phrases with wh in situ, with respect to the way in which the wh-operator interact with universal quantifiers in the sentence, the results reveal a scope asymmetry between the two types of *wh* strategies, that suggest that successive cyclic movement is involved in the former strategy, but not in the latter. I will begin comparing the two strategies by looking at Indonesian, a language where both strategies are possible. Then I will look at Chinese, a language where wh in situ is the only strategy for making constituent questions.

2.3.1. Wh-Quantifier Interaction in Indonesian: An Asymmetry.

Saddy (1991) argues that, in Indonesian, questions with quantifiers are ambiguous when the *wh*-phrase is overtly moved, and unambiguous when the *wh*-phrase is

pronounced in situ. He gives the examples below. I indicate the NPs that are expected to interact scopally with bald-face.

(101) **Setiap orang** men-cintai **siapa**. *(SA, *PL)*
every person trans-love who
'Who does everyone love?'

(101') **Siapa**$_i$ yang setiap orang ø-cintai t_i. *(SA, PL)*
who every person loves
'Who does every person love?'

My Indonesian informants, however, find that the examples in (101) allow for a PL-interpretation. Specially if the noun-phrase accompanying the determiner is one other than *orang* 'person' or if one uses a universal of the form *masing masing*-NP 'each-NP', provided, of course, that the appropriate context is given. Thus, they find that (102)-(103) are ambiguous.

(102) **Masing masing pelajar** men-cintai **orang mana** *(SA, PL)*
each student trans-kiss person which
Which person does every student love?

(103) **Setiap pelajar** men-beli **apa** *(SA, PL)*
every student trans-buy what
What did every student buy?

But an asymmetry similar to the one Saddy alludes to shows up in the context of WIs for my informants, and regardless of whether the quantifier is of the form *setiap*-NP 'every NP' , or of the form *masing masing*-NP 'each-NP'. Consider the following examples.

(104) **Orang mana**$_k$ yang Mary ingin tahu **[setiap pelajar** harus ø-cium t_k]
person which M. wants-to-know if every person should kiss

Which person does Mary wonder whether every student should kiss?

(*SA, *PL*)

(105) **Orang mana**$_k$ yang Mary ingin tahu **setiap anak perempuan** ø-cium t_k.
person which M. not know every child female kiss
Which person doesn't Mary know if every girl kissed?

(*SA, *PL*)

(106) **Orang mana**$_k$ yang **setiap pelajar** ingin tahu [Mary harus ø-cium t_k]
person which every student wants-to-know if M. should kiss
Which person does every student wonder whether Mary should kiss?

(*SA, PL*)

(107) **Orang mana**$_k$ yang **setiap anak perempuan** ingin tahu Mary harus ø-cium t_k.
person which every child female wants to know M. should kiss
'which person every girl not know whether Mary should kiss'

(*SA, PL*)

(108) **Setiap pelajar** ingin tahu [Mary harus men-cium **orang mana**]
every student wants-to-know if M. should kiss person which
Which person does every student wonder whether Mary should kiss?

(*SA, *PL*)

(109) **Setiap anak perempuan** tidak [tahu Mary harus men-cium **orang mana**].
every child female not know M. should kiss person which
'which person every girl not know whether Mary should kiss'

(*SA, *PL*)

(104)-(105) where the *wh*-phrase has been extracted overtly and the quantifier occurs inside a WI are unambiguous which is expected given Longobardi's observation, and our suggestion in section 1.4, that higher order quantification in general is not possible across a WI. Notice that the prefix *men-* has deleted from the verb inside the island. If *men*-deletion is the trade mark of movement through the vP phase as I suggested in section 1.1.1, then examples like (104)-(109) shows that cyclicity also takes

place inside the WI. The examples in (106)-(107), where the *wh*-phrase has been fronted overtly and the quantifier is outside the WI and c-commanding the *wh*-trace, are ambiguous between a single individual reading and a PL-answer interpretation of the question.

The ambiguity in this case is also expected given that the matrix vP, which contains a copy of the moved *wh*-phrase, is c-commanded by the quantifier in subject position. What is unexpected, however, is the fact that the examples in (108) and (109) are unambiguous. If wh-phrases in situ needs to move covertly in order to get to their scope position, and if this movement is cyclic, then covert movement of the in situ phrases in (108)-(109) should leave copies in Spec of the matrix vPs. If that were the case however, PL-reading should be available in those examples contrary to facts. In those examples the wh-phrase only takes maximal scope. There are two ways to explain the lack of PL-readings in (108) to (109), either wh-phrases in situ does not get their scope via movement, or their movement is not successive cyclic. Below I will discuss facts from Chinese and English showing that the situation is also the same in these languages.

2.3.2 Wh-quantifier Interactions in Chinese.

The interaction of wh-phrases with quantifiers in Chinese is similar to that of Indonesian when the in situ strategy is used in the latter language. Consider the following example from Huang (1982). '%' indicates that the judgment is possible only for some speakers.

(110) Mei-ge-ren dou mai-le shenme (*SA, PL*)
every-CL-person all buy-ASP what
'What did everyone buy?'

(111) %Mei-ge-ren dou shuo shei zui congming (*SA, PL*)
every-CL-person all say who most clever
'Who does everyone say is the most clever'

There is discrepancy in the literature as to whether the sentences in (110)-(111) are ambiguous. Huang (1982) for instance claims that (110) is unambiguos, allowing only a single answer. Aoun and Li (1993), on the other hand, claims that (110) allows both a single answer and a PL-interpretation. Cheng (1991) acknowledges the availability of the PL-interpretation and claims that it is due to the fact that the particle *dou* 'all' is necessarily distributive. She seems to side with both Huang and Aoun and Li assuming that the PL-interpretation is possible when *dou* is present, and absent when that particle is not present. My informants side with Aoun and Li (1993) finding that both (110) and (111) are in fact ambiguous. Consider now, however, the following example.

(112) Mei -ge- ren dou xiang-zhidao [wo weishenme mai shenme]?
every-CL-person all wonder I why buy what
'What is the thing x such that every person wonder why I bought x ?
(*SA, *PL*)

The speakers of Chinese I consulted on this example find that this question can be answered with the Chinese equivalent of (113a), but not with the equivalent of (113b). In other words, the question in (112), allows a single individual interpretation, but it doesn't allow a PL-answer.

(113) a. Every person wonders why you bought the table.
b. Franny wonders why you bought the table, Zhiqiang wonders why you bought the computer, ...

Chinese thus patterns with Indonesian when questions with quantifiers, in the latter language, employ the wh-in-situ strategy. The conclusion therefore must be the same for Chinese: the scope of wh-in-situ in this language is not assigned through successive cyclic movement. If that were the case, a copy of the wh-phrase would be lodged in the matrix vP and the PL-interpretation would be possible contrary to facts. In the next section, I will consider the interaction of in-situ wh-phrases in English in context of so-called *quiz-master questions*.

2.3.3 Questions with Quantifiers in Quiz-master Questions.

A quiz master question (QMQ) is a mode of interrogation in which the person who utters the question knows the answer, but is testing the knowledge that the speaker has of the question. A quiz-master question is thus an information seeking question, although the purpose of obtaining the information is not to relief the speaker from a certain state of ignorance as is the normal case with questions (see e.g., Higginbotham 1991, 1995). Cole (1981), observes that in quiz-master questions *wh*-phrases can be optionally left in situ in English. Thus, both of the questions below are possible in a quiz-master situation.

(114) a. (Participant 1), Which NBA star was awarded the MVP award in 1997.
b. (Participant 1), The MVP award was awarded to which NBA star in 1997.

Both of the strategies or mode of interrogation in (114) are possible and are interpreted as constituents questions: the addressee must supply some information that count as an answer to the question. So when it comes to quiz-master questions, English is pretty much Indonesian: the question word can either be fronted or left in situ. We can thus reproduce the Indonesian situation in English in the quiz-master scenario. Consider the following examples.

(115) Which woman did every secretary of state (SoS) regret that the president had an affair with? (*SA, PL*)

(116) Which woman did each SoS deny that the president had an affair with? (*SA, PL*)

(117) Which woman does every SoS wonders whether the president had an affair with (*SA, PL*)

(118) Every SoS regretted that the president had an affair with which woman?

(*SA, *PL*)

(119) Each SoS denied that the president had an affair with which woman?

(*SA, *PL*)

(120) Every SoS wonders whether the president had an affair with which woman?

(*SA, *PL*)

Native speakers of English find that if they are participating in a quiz-master game, say *The Weakest Link*, they can answer (115)-(117) by given either single answers or PL-answers depending on what is in fact the case. However, they feel that the questions in (118)-(120) only demand single answers; so, they don't use a PL- answer in this case. To some extent this is like what we have already seen for Indonesian and Chinese above, there is a slight difference, however. For reasons not very clear to me, in the in situ strategy, English QMQs do not seem to support PL-readings even in the absence of WIs as illustrated below:

(121) Each SoS reported that the president had an affair with which woman?

(*SA, *PL*)

(122) Every SoS said that the president had an affair with which woman?

(*SA, *PL*)

I have no explanation for the lack of PL-readings in the absence of WIs in examples like (121)-(122)[9]. QMQs in other languages do allow PL-interpretations in the

[9] It is not the case that the in situ strategy never allows the PL-interpretation in English QMQs. Some speakers find that PL-readings is available in simple sentences like the English gloss in (123), which is judged to be ambiguous once the appropriate context is given. So perhaps in sentences like (121)-(122), the distance between the *wh*-phrase and the universal in the matrix clause somehow makes the PL-interpretation not readily available. However, these remarks are speculatory and more research is needed to determine the nature of the status of the PL-reading in (121)-(122).

in situ strategy. Consider, for instance, the following Spanish QMQs where the wh-phrase is left in situ.

(123) ¿Durante la ceremonia de apertura, cada participante bailó con quien?
during the ceremony of opening each candidate danced with whom
'During the opening ceremony , each candidate danced with whom?'

(*SA, PL*)

The Spanish QMQ in (123) is ambiguous allowing either a PL-reading or a single answer. However, just like the English cases in (118)-(120), if the *wh*-phrase occurs inside an island, and the universal quantifier is the subject of the matrix clause containing the island, the PL-interpretation is not available:

(124) Cada secretario de estado (SdE) nego que el presidente habia salido
each secretary of state denied that the president had gone out
con cual mujer
with which woman
'Each SoS denied that the president went out with which woman'

(*SA, *PL*)

This contrast with the situation in which the wh-phrase is extracted overtly in the same QMQ context, which is ambiguous between the single answer and the PL:

(125) **Con cual mujer** nego cada SdE que el presidente habia salido **t**
with which woman denied each SoS that the president had gone out
Which woman did each SoS deny that the president had gone out with t?

(*SA, PL*)

Given the previous discussion, it seems that, putting language specific idiosyncrasies aside, it seems that the asymmetry between overt *wh*-movement and wh-in situ in terms of the scopal properties of the *wh*-phrase, in the context of WIs, is cross-linguistically

robust: overt extraction out of a WI yields intermediate PL-readings if a universal quantifier sits in the subject of the clause containing the WI; but the same interpretations are not available for the wh in situ strategy. Given the analysis of PL-interpretation developed in this dissertation, the first result is only possible if the wh-phrase has targeted the matrix vP as an intermediate site for movement on its way to the COMP position.

By the same token, the absence of PL-readings in questions with quantifiers involving the same context (i.e., a WI below a subject quantifier in the matrix clause), but where the wh-phrase has been left in situ, can only be explained under a disjunctive conclusion: either the wh-phrase does not get its scope via movement, or if it moves, it does it in a single swoop. The question is how we can develop a semantic analysis of the facts that is consistent with such a conclusion. I will provide an analysis of the facts in the following section.

2.4. A Proposal: In situ Interpretation Without Choice Functions.

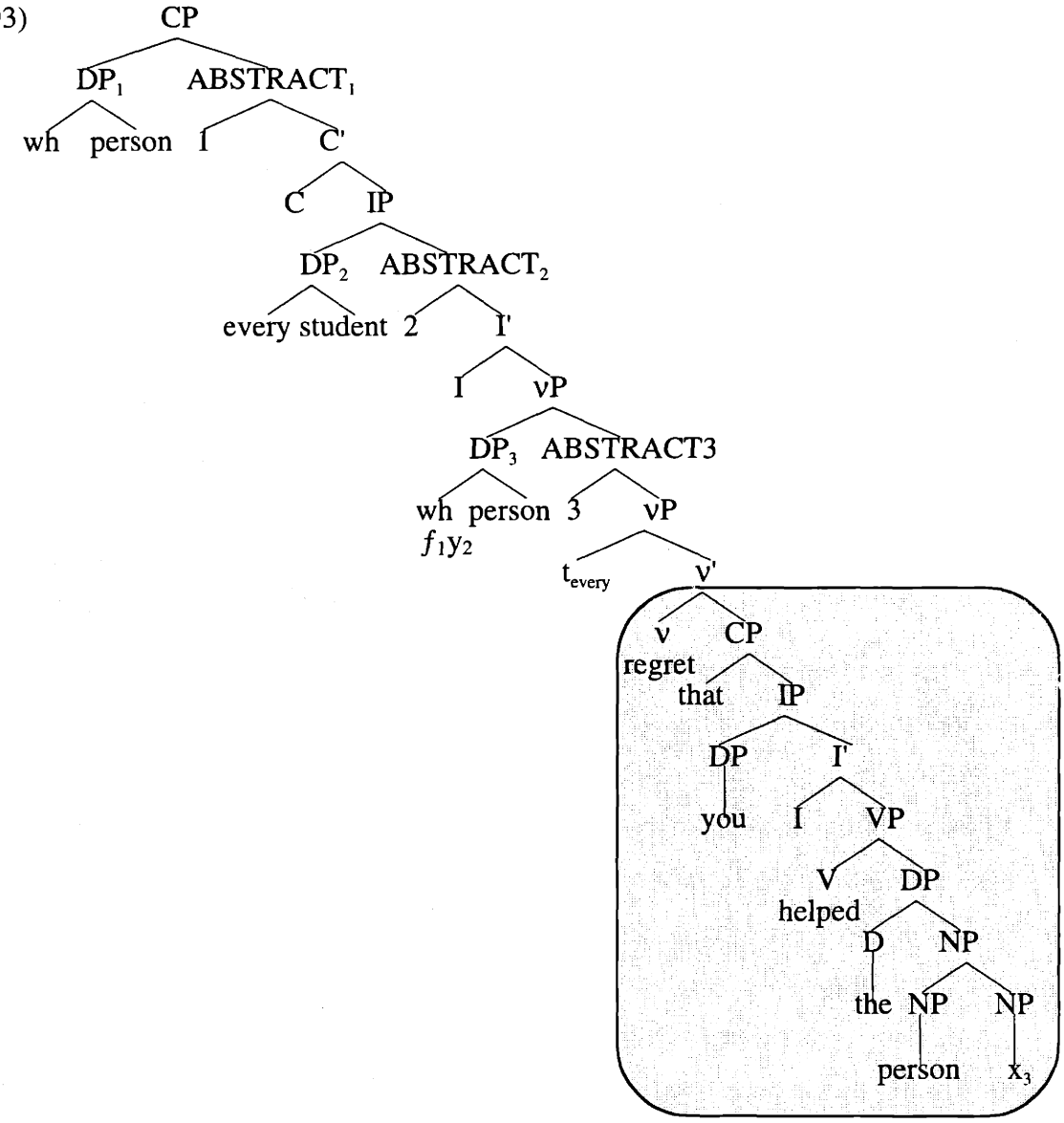
In the last three sections we saw that PL-readings are possible in questions with quantifiers where the wh-phrase is left in situ in Languages like Indonesian, and Chinese, on the one hand, and, to some extent, in the Spanish and English QMQs. We also saw that in multi-clausal examples in which the universal quantifier is in the subject position of a clause containing a WI, which in turn contains the base position of the wh-phrase, overt extraction behave different from wh in situ: the former triggers intermediate PL-readings, the latter doesn't. In section 1.4, I argued following several researchers that the absence of PL-readings inside a WI falls under the generalization (90), repeated below.

(91) Only *wh*-dependencies involving quantification over individuals can span a WI.

a copy of a wh-phrase inside a WI cannot be interpreted in terms of skolemized choice functions because of the effects of whatever principles is responsible for the generalization in (90). In the case of overt extraction out of WIs the wh-phrase stops at the intermediate matrix vP and the copy left there can be analyzed as a skolemized choice

function been bound from the COMP position as indicated in (92), repeated below, the result being an intermediate PL-reading. As shown in the structure in (92), intermediate PL-readings involve two types of quantification, quantification over function, outside the island, and quantification over individual across the WI.

(93)



The question now is how wh-phrases in situ are interpreted under the disjunctive conclusion of the previous section; i.e., under the conclusion that wh-phrases in situ either do not move, or, otherwise, they move in a single swoop (i.e. in non-cyclic fashion). I consider each of these possibilities below.

2.4.1. Possibility 1: the Wh-phrase Stays Inside the WI.

Under this possibility, we still need to assign wide scope to the in situ wh-phrase through one mechanism or another. The alternative that suggests itself is to interpret the wh-phrase in situ and use a mechanism of existential closure along the lines of those proposed in Heim (1982) and Reinhart (1997).

However, if one takes the generalization in (90) seriously, as I am doing here, wh in situ inside WIs should not be assigned wide scope with the help of choice functions as argued in Reinhart's work. Such an analysis would run against the constraint behind the relevant generalization. This is not a problem, however, since there are other alternative ways of interpreting wh-phrases in situ. Once can use, for instance, Fox's (2001) trace conversion mechanism to apply to the *wh*-phrase in situ and have existential closure insert and existential quantifier over individual variables (as in Heim 1982) at the top-most level. This move is consistent with the generalization in (90), and does not add any complexity to our proposal. As fox (2001) shows, trace conversion is independently needed, and as such it is available to us without any extra cost.

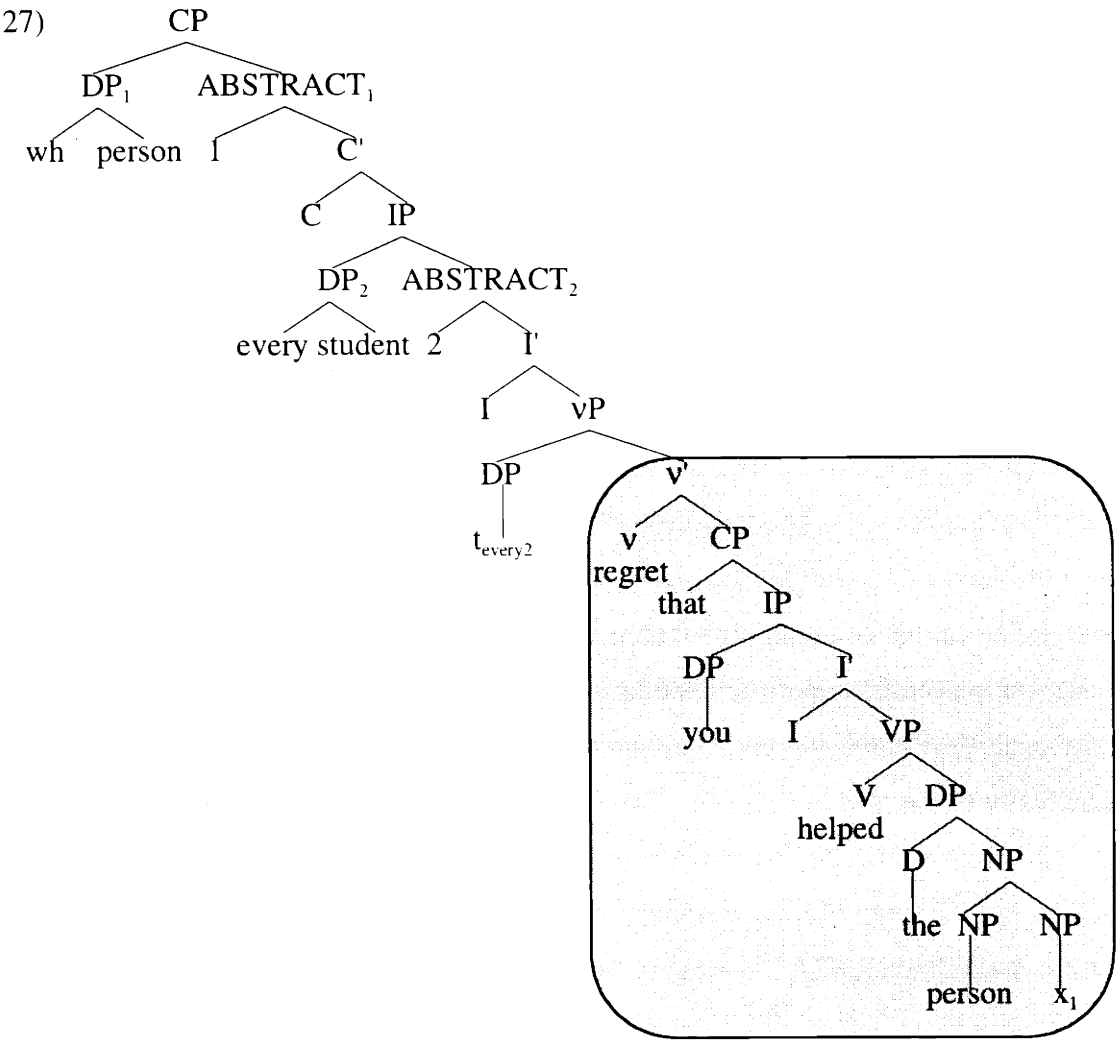
2.4.2. Possibility 2: The Wh-phrase Moves in a Single Swoop.

To better consider this possibility, consider the sentence in (126):

(126) Every student [regretted that you helped which person]

Under the hypothesis that the wh-phrase moves covertly in non-cyclic fashion, (126) is associated with the structure in (127) after covert movement has applied.

(127)



In (127), the wh-phrase has moved covertly to the COMP position in a single swoop. Under this possibility, there are no copies of the wh-phrase in the intermediate positions. Given the generalization in (90), the wh-phrase contained within the island, indicated by the shadowed rounded-rectangle in (127), cannot be interpreted in terms of choice functions of any kind (e.g., skolemized choice functions), but it can be interpreted as a definite description as suggested by Fox (2001). The free individual variable must therefore be bound by the copy of the wh-phrase in the COMP position. This means that in this case the wh-phrase must be interpreted as an interrogative generalized quantifier over individual variables as in Heim (2001).

What this means is that in a way, although choice functions seem necessary as a mechanism in order to capture PL-readings without scoping the quantifier over the wh-

phrase in the COMP position, the initial motivation behind Reinhart's original proposal in the context of wh in situ, i.e., the assignment of out-of-island scope to wh-in situ, does not seem to be empirically substantiated. The generalization in (91), which is cross-linguistically supported, militates against any functional approach to the wide scope interpretation of wh in situ occurring inside an island.

2.5. Conclusion.

In this chapter I have used the availability of PL-interpretations as a diagnostic for successive cyclicity. We saw that the interaction of PL-readings with grammatical principles like the binding conditions can help us identify the intermediate landing sites that are use by phrases that are displaced overtly. In the last part of this chapter, we have seen that in the context of WIs, overt extraction can yield intermediate PL-readings if there is a universal quantifier in the subject position of the clause containing the island. I took that to be evidence that the wh-phrase leaves a copy outside the island, but below the subject position in the matrix clause. Such an analysis is imposed on us by the evidence discussed in chapters 1 and 2, and by the effect of Longobardi's observation. Surprisingly, we saw that questions with wh in situ and a quantifier in the subject position of the matrix clause are not ambiguous if the wh-phrase occurs inside an island. I take this asymmetry to show that wh-phrases in situ either do no get their scope via movement, or their movement takes place in a single swoop. This is clearly a promising avenue of research and will definitely occupy the center of my future research agenda.

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