Decomposing Questions

by

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ABSTRACT

The primary proposal of this thesis that in questions, a "Q" morpheme must undergo syntactic movement from a clause-internal position to a clause-peripheral position. Throughout this thesis, we develop a syntactic analysis and a semantic formalism for questions that accounts for the facts observed in *wh*-in-situ languages (focusing mainly on Japanese, Sinhala, Shuri Okinawan, and premodern Japanese).

We contrast two unrelated languages, Japanese and Sinhala, which form questions in a nearly identical way, but which differ in the placement of Q. We hypothesize that in both languages Q moves from a clause-internal position (corresponding to its overt position in Sinhala) to a clause-peripheral position (corresponding to its overt position in Japanese). We argue for this movement relation by examining the effects of movement islands and other "intervenors" when placed in the path of the hypothesized movement.

We also observe that in both languages, indefinites can be formed by appending Q directly to a *wh*-word in a declarative sentence. Using this, we develop a compositional semantic account under which *wh*-words like *who* are represented as sets of individuals and Q is represented as an existential quantifier over choice function variables. This, in conjunction with the proposed syntax, allows us to derive the semantics both of questions and of indefinites containing *wh*-words.

More complex issues arise when considering questions with multiple *wh*-words and with quantifiers. It is proposed that in multiple questions, Q originates by the lowest *wh*-word. If Q moves to the clause periphery from there, a "pair-list" reading will result, while if Q first moves above the *wh*-words, a "single-pair" reading results. Through the use of a semantic mechanism called "flexible functional application", this generalization is derived from the proposed semantics of pair-list questions, which are semantically represented as a set of questions. Questions with quantifiers with functional readings and with pair-list readings are also discussed in detail.

Arguments for several more theory-internal proposals are made as well, including an argument for a "single cycle" syntax, and an argument for a type of movement labeled "migration" which is crucially different from "feature attraction."

Thesis Supervisor: David Pesetsky
Title: Professor of Linguistics

Acknowledgments

The other day I got out a can opener and was opening a
can of worms when I thought "What am I doing?!"
—Jack Handey, *Deepest Thoughts*

Like all theses—in fact, probably like all work in linguistics—actually, like all work in science—well, perhaps just like *everything*—this has been a collaborative effort on a colossal scale. I have received much help along the way from various and sundry sources. And I'm ready to name names.

I must of course begin with my thesis committee, each member of which has had an enormous impact on how this thesis turned out. I owe them each and collectively a great debt of gratitude.

David Pesetsky, chair of my thesis committee and long-time syntactic confidant, has been immensely helpful (and very patient) since he was chair of my generals committee all those many years ago. He withstood well the barrage of densely written and internally inconsistent handouts, papers, abstracts, and drafts, always managing to be both tangibly helpful as well as encouraging. David is also very good at viewing a troublesome problem from a completely different angle, which has often proved extremely enlightening (though often entirely inconsistent with my assumptions about the world).

I am also very fortunate to have been able to work with Noam Chomsky on this thesis; his contributions to this work have had both subtle and catastrophic impact on the final shape of the account. He read several drafts with meticulous care, missing nary a one of my leaps of logic. His comments were always extremely insightful and encouraging. Without fail, just after each meeting I had with Noam, some fundamental aspect of my analysis would change—and always for the better. This generalization does not exclude my defense.

I am glad to have had the opportunity to work with Irene Heim in this process. Meetings with her about the semantic parts of this thesis always managed to soothe my fears about parts of my account which I was unsure about, while at the same time wreaking terrible havoc on the parts that I thought were innocuous. In semantics, the formalisms can sometimes make it hard to differentiate the really interesting problems from the purely notational ones. Usually I got it backwards, of course, but Irene was able to set me right.

The debt I (and this thesis) owe to Shigeru Miyagawa is tremendous. Meetings with him were invariably productive, even (or especially?) when they went in a direction I had not expected. Shigeru was always quick to notice predictions I had missed, and always knew who had worked on similar things in the past. His enthusiasm and encouragement made working with him a very enjoyable experience. In addition, his heroics in the face of my never-ending stream of judgment questions was truly the stuff of legends. Outside of our academic contact, I was also lucky to have worked with Shigeru during the year that I was a graduate resident tutor at the East Campus dormitory and Shigeru was our (very active and caring) housemaster.

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Michael Kenstowicz and Cheryl Zoll were both tremendously encouraging in my phonological endeavors. Michael was a "ghost member" of my phonology generals

committee, reading and commenting every bit as carefully and insightfully as my actual committee members. His vast knowledge of phonological phenomena was of immeasurable help. Cheryl arrived at MIT after my generals paper was finished, but her enthusiasm about my own work and about phonological issues in general *kept* me interested in phonology. Cheryl was perhaps a "post-hoc ghost member" of my generals committee; she guided me skillfully through the major rewrite and extension of my phonology generals paper that appeared in MITWPL 30. I had to go on hiatus from phonology in order to write this thesis, but I have no doubt I will return.

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Alec Marantz and I were more often found in discussions of the state of the Macintosh than about linguistics; Alec is almost as much of a Mac nerd as me. He even had an Apple /// way back when (and those few who know what an Apple /// *is* will understand why this is a point of respect). Alec also taught one of most insightful and deep courses I have ever taken, and made me realize that there really is something *to* morphology.

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seemed to live two life's worth at once, and I have no idea how. Among other things, Rob played a mean guitar and a respectable digeridoo. He was inspiring, if a bit mysterious.

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Where are we? Page 4?

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Part I: Toward a syntax of *wh*-in-situ

Part II: What is a question? Toward a semantics of *wh*-in-situ

Chapter 1 Introduction

What makes a question? Our goal in this thesis will be to provide the beginnings of an answer to this question by looking closely at the syntax, morphology, and semantics of questions.

To begin, we must start with certain assumptions. First, we will assume that there is a concept of "question" which is invariant across languages. It is uncontroversial that questions form a part of discourse in all human languages, but the assumption we are making here is quite a bit stronger. Specifically, the idea is that not only do all human languages make use of questions, but that questions in every language share a common core. A primary task of this dissertation is to characterize this common core.

The idea that questions have something in common across languages is a subpart of a larger assumption about language and its interpretation. Language is, at the most basic level, a pairing of sound (or some comparable perceivable medium) and meaning. It is readily apparent that there is a great deal of variation between languages in the specifics of this mapping between sound and meaning, but what we will assume here is that languages do not vary with respect to the *form* which the meaning of a linguistic utterance takes. Though somewhat of an oversimplification, the idea is that there is a representation of *I read a book* in the mind of an English speaker, which is the same as the corresponding representation of *J'ai lu un livre* in the mind of a French speaker which is the same as the corresponding representation of *Nanun chaykul ilkessta* in the mind of a Korean speaker, and so forth.

Of course, there are also dramatic differences between languages, none more obvious than the differences in vocabulary. To refer to what an English speaker calls *a book*, a speaker of French would use *un livre*, while a speaker of Korean would use *chayk*. Moreover, different distinctions play a role in different languages; in French, it matters that *livre* is part of the class of words with masculine gender, and in Korean, which case suffix *chayk* receives depends on whether it is being used as an object, a subject, an instrumental, and so forth.

The architecture of the language faculty which we will assume here has the following properties. There is a lexicon, which is a list (perhaps structured in certain ways which are for the most part irrelevant here) of the component pieces from which utterances are constructed. An utterance is constructed by combining a set of pieces from the lexicon in particular ways into a linguistic object. The linguistic object is interpreted by the sensorimotor systems (perhaps through one or more intermediate systems), resulting in a perceivable output (e.g., speech). The linguistic object is also interpreted by the part of the mind involved in understanding and reasoning, resulting in a perception of its meaning.

Crucially, we assume that the *principles* by which meaning is extracted from a linguistic object are invariant across languages. We will leave open the possibility that two distinguishable representations may be interpreted by these same principles and result in the same meaning. By assuming an invariant interpretive mechanism, and assuming the result of interpreting a question shares a common form in all languages, it follows that there are at least certain lexical primitives, atoms of meaning, which are shared by all languages.

To place this approach into context, we are essentially following the "minimalist program" as set out in Chomsky (1993, *et seq.*). Under this view, there is an invariant computational system ("C_{HL}", the "computational system for human language") which takes elements from the lexicon and forms interpretable linguistic objects. The extent to which the results of this computation differ across languages is due to differences in the composition of the elements used as input to the computation. Put another way, the locus of language variation is the lexicon. We know that languages must *at least* differ in their lexicons, and so we hypothesize that languages *only* differ in their lexicons. The computational system takes a "numeration" of lexical items (in essence a set, but structured to allow multiple occurrences of otherwise indistinguishable objects), and yields two representations, one ("PF", historically "phonetic form") which serves as the interface to the system responsible for the perceivable output, and another ("LF", historically "logical form") which serves as an interface to the conceptual/meaning system.

There are (at least) three distinguishable systems involved in language: an "articulatory-perceptual" (A-P) system, a computational system (C_{HL}), and a "conceptual-intentional" (C-I) system. We will assume that the three systems are distinct, and as such there is no *a priori* reason to think that they share any common representational vocabulary. Each pair of systems interact with one another at a single interface point. The idea at the heart of the minimalist approach is that only certain representations can be interpreted at these interfaces. It is the job of C_{HL} to take the elements of the numeration (from the lexicon) and arrange them in a form which can be interpreted by the A-P system (the "PF representation") and a form which can be interpreted by the C-I system (the "LF representation"). If, for any reason, the PF representation cannot be read by the A-P system, the representation is said to have "crashed at PF." Similarly, if the LF representation cannot be read by the C-I system, the representation has "crashed at LF." Only if the representations at both interfaces are interpretable does a linguistic object "converge," earning it "well-formed" status.

To narrow our focus back down to questions, our task in this thesis is to characterize what appear to be the lexical primitives involved in questions. We will look at the morphology of questions and of question words to learn more about how the semantic primitives are bundled in the lexicon and during the derivation, we will look at the meanings of questions to learn more about the semantic primitives involved, and we will look at the syntax of questions to learn more about the principles which define the representations at the LF interface. We will primarily be concerned with languages which form questions without overt movement of the question words (or "*wh*-words", named after the question words in English). The languages we will primarily focus on in this thesis (Japanese, Sinhala, and Shuri Okinawan) are all languages of this type.

1. Thesis overview

The remainder of this chapter will be devoted to introducing the morphology of questions in Japanese, Sinhala, premodern Japanese, and Shuri Okinawan; these are the languages which play the most central role in the discussions in the following chapters. These languages have in common the property of being "*wh*-in-situ"; when forming *wh*-questions, the *wh*-word (corresponding, for example, to English *what*) appears in the

position in which we find its noninterrogative counterpart. In each of these languages, questions also involve a morpheme we will refer to as 'Q'. In Japanese, Q appears as a question-final particle. In Sinhala, Q generally appears next to the *wh*-word itself.

Chapter 2 is devoted to proposing and defending the claim that Q *moves* syntactically from the clause-internal position (i.e., where we see in it Sinhala) to a clause-peripheral position (i.e., where we see it in Japanese). Starting with Sinhala, where Q is usually clause-internal, we find that Q can under certain specific circumstances appear overtly at the clause periphery. We also find a correlation between the appearance of a particular verbal suffix and the position of Q. Both of these facts suggest that Q can make the proposed movement overtly in certain cases, "checking" the formal feature responsible for the verbal morphology when it does. Supporting this conclusion are facts showing that Q cannot appear inside an "island"; islands, assumed to block movement, seem to block the association between Q and the clause periphery. In these cases, we find that Q can surface clause-internally only if it appears just *outside* the island.

We then turn to Japanese, where the proposed movement of Q in questions invariably happens overtly. Using the emphatic *ittai* '...in the world' (e.g. *ittai nani* 'what in the world'), we are able to localize the "launching site" of Q, which corresponds to the overt position of Q in Sinhala questions. With the help of *ittai*, we find that the same pattern in Japanese that we saw in Sinhala; the launching site of Q cannot be inside an island, but can be just outside. The second major class of evidence we review involves "intervention effects." In Japanese, certain lexical elements cannot be on the path of movement between the launching site of Q and its observed peripheral position. Moving these "intervenors" around the structure gives us further evidence that Q moves.

Chapter 3 addresses the syntactic issues raised by multiple questions and by questions with quantifiers. In questions with more than one *wh*-word, only one Q surfaces (per interrogative clause), and one goal of chapter 3 is to discover where it launches from. We conclude that when Q launches from a position close to the structurally lowest *wh*-word, a question can be answered with a list of pairs. This is the "Pair-list Antisuperiority" generalization. We also introduce the "Q-introduction Antisuperiority" generalization, which restricts the base-position of Q to the structurally lowest *wh*-word. We support these "antisuperiority generalizations" by looking at their interactions with scrambling in Japanese and in German, and also by looking briefly at the "additional-*wh*-effect" in Japanese.

Next we consider questions with quantifiers, and conclude that when such questions are requests for a list of pairs, the quantifier has moved to a position outside of the interrogative clause (giving a structure something like *For everyone x, what did x buy?* for the pair-list reading of *What did everyone buy?*). We review some evidence in favor of this from Japanese and Chinese.

Chapter 4 contains discussions which build on the results from chapters 2–3. In the first section, we confront the important question of whether the place where Q enters the derivation (its "base position") needs to be distinguished from the "launching site" of Q. Chapter 2 showed us that Q can "launch" from the edges of islands. This section provides empirical evidence that Q was originally inside the island in such cases. This forces us to a view ("Local Generation") in which Q is generally base-generated as a sister to a *wh*-word and, if inside an island, can "migrate" to the island periphery (from which point it "launches" to the clause periphery).

The second section of chapter 4 discusses one alternative ("LF pied piping") to the proposal developed in chapters 2–3. We review the arguments that might differentiate LF pied piping from the present proposal. The third section reviews the properties of the emphatic particle *-koso* in Japanese. We discover that the details of its distribution imply that the syntactic derivation must take place in a "single cycle" (in a derivation that proceeds strictly bottom-to-top, rather than all overt movement being followed by all covert movement). The fourth section contains some brief remarks on differences in behavior between "*wh*-islands" in Japanese and Sinhala, and the last section provides a brief analysis of questions in Malay.

With chapter 5, we begin an entirely new facet of the discussion, turning our attention to the *semantics* of questions, with an eye toward the prior discussions of the structural properties of questions. Chapter 5 begins by outlining the basic assumptions about questions (which we represent as a set of propositions) and about semantic compositionality. We then turn to propose a semantic representation for Q and for *wh*-words that accounts for the fact (as we will see later in this chapter) that these components can be used both in questions and in indefinites (e.g., like *dareka* 'someone' in Japanese, formed from *dare* 'who' and *-ka* 'Q'). One important conclusion we draw in chapter 5 is that intuitively plausible semantic values for Q and for *wh*-words, coupled with the distributional and syntactic properties studied in the first four chapters, yields the appropriate semantic representations for each of the environments in which these elements appear. The specific semantic proposal is that a *wh*-word like *dare* 'who' is translated as a set of individuals in the semantic representation, and that Q represents an existential quantifier over "choice function" variables.[1] We also look at how the semantic representation of a syntactic island containing a *wh*-word is derived (these being the cases where Q is launched from outside the island). A crucial part of the account of islands is the mechanism of "flexible functional application" which allows us to compute a semantic value for a predicate given a *set* of arguments.

In chapter 6, we turn to structurally more complicated questions, proposing a semantics for multiple questions and for questions with quantifiers that receive functional readings. Starting with multiple questions, we discuss the semantic basis for the "Pair-list Antisuperiority" generalization introduced in chapter 3, showing how the syntactic structure argued for in chapter 3 results in a "pair-list" reading for multiple questions. The pair-list reading is claimed to arise from a representation that evaluates as a *set* of questions. With Q launching from below one or more of the *wh*-words, flexible functional application (introduced in chapter 5) yields this set of questions in a mechanically straightforward way.

Having dealt with multiple questions, we then consider questions with quantifiers that receive functional readings. The syntactic constraints discussed in chapter 2 force us to a particular analysis of these readings, which involves the optional use of a "functional accessibility" operator to provide a pronominal argument for the quantifier to bind.

The last major section of chapter 6 discusses the phenomenon of "long distance lists", questions in which a *wh*-word in a lower interrogative clause seems to take matrix scope. These are cases like *Who knows where we bought what?* where one of the

[1] A choice function (as described in more detail in chapter 5), is a function which chooses a single member from a set.

possible answers is a list of pairs for *who* and *what* (e.g., *John knows where we bought x, Mary knows where we bought y*). We see that the mechanism of flexible functional application in fact predicts both the existence and properties of these readings.

Chapter 7 addresses the most complicated kind of question, questions with quantifiers that receive pair-list readings. We start by reviewing evidence that clauses with this kind of interpretation are themselves quantificational, and subject to "Quantifier Raising" ("QR"). This ties up the semantic end of the proposal from chapter 3 that quantifiers in these kinds of questions must move to a position outside the interrogative clause. The discussion proceeds by working out a semantics for "quantifying in" of this kind, which requires "type lifting" of questions (the explanation of this, however, is best saved for chapter 7 itself).

The last chapter addresses remaining issues about the "antisuperiority generalizations" from chapter 3, and then ties together the results of the whole thesis and situates it in the larger context.

2. On Japanese *-ka*, *-mo*, and *wh*-words

Of the languages we will be concerned with in this chapter, Japanese has received the most attention in the literature to date, so for the sake of familiarity we begin our discussion here.

Japanese is a strictly verb-final language. An example of a declarative Japanese sentence is given in (1). A *wh*-question formed by questioning the object is given in (2). Notice two things in particular: first, the question word *nani* 'what' remains in object position, and second, the fact that it is a question is indicated by a sentence-final particle *-ka*. We will gloss this *-ka* as 'Q'.

(1) John-ga hon-o katta.
John-NOM book-ACC bought
'John bought a book.'

(2) John-ga **nani**-o kaimasita **ka**?
John-NOM **what**-ACC bought.polite **Q**
'What did John buy?'

The fact that the *wh*-object remains in the same position as the object in a declarative sentence places Japanese in the "*wh*-in-situ" category of languages, different from languages like English which require movement of one question word to clause-initial position in *wh*-questions.

To avoid potential confusion, let me point out that there are several different sentence-final endings associated with matrix *wh*-questions in Japanese. One, *-ka*, was used above in (2). For the rest of this thesis, the assumption will be that *-ka* is the basic case, and it will be the one we refer to. There are other *wh*-question markers, however, including *-no*, as in (3a), *-ndai*, as in (3b), and even no marking at all (other than its rising

intonation), as in (3c).[2,3] The most common realization of the utterance-final question marker in the examples in this thesis is actually *-no*.[4]

(3) a. dare-ga kuru **no**?
who-NOM come **Q**
'Who will come?'

b. dare-ga kuru **ndai**?
who-NOM come **WHQ**
'Who will come?'

c. dare-ga kuru? (*rising intonation*)
who-NOM come
'Who will come?'

Forming a yes-no question in Japanese is accomplished by taking a declarative sentence and appending a question marker. Most of the same options are available in yes-no questions as in *wh*-questions with respect to sentence-final question marking. In (4a), a yes-no question is marked with *-ka*, and in (4a) with *-no*.

(4) a. gakkoo-ni ik-imas-u (**ka**)?
school-to go-POL-PRES (**Q**)
'(Are you) going to school?'

b. gakkoo-ni ik-u (**no**)?
school-to go-PRES (**Q**)
'(Are you) going to school?' (Yoshida & Yoshida 1997)

In each case, the question marker can be dropped, leaving the question to be identified as such only by its rising intonation. The question marker *-ndai* is different in that it only seems to be available with *wh*-questions (Miyagawa 1998). Also, when a question is embedded, as in (5a) below, *-ka* is the only option of those mentioned above for use as the question marker.

The contrast between (5a) and (5b) shows that the clause on which the question marking appears determines the "scope" of the question. In (5a), *-ka* appears on the embedded verb and yields an embedded question, while in (5b) *-ka* (here, *-no*) appears on the matrix verb and yields a matrix (information-seeking) question.

(5) a. John-ga [Mary-ga **nani**-o katta **ka**] sitteiru.
John-NOM Mary-NOM **what**-ACC bought **Q** knows
'John knows what Mary bought.'

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[2] There is reason to believe that *-no* is a reduced form of *-no desu ka*, consisting of a clausal nominalizer *-no*, 'be', and the question marker *-ka*.

[3] According to Miyagawa (1998), *-ndai* is only stylistically appropriate in informal male speech.

[4] The choice of matrix interrogative marking between *-no* and *-ka* depends on the politeness marking on the verb (see Miyagawa 1987, Yanagida 1995).

b. John-ga [Mary-ga **nani**-o katta to] omotteiru **no**?
John-NOM Mary-NOM **what**-ACC bought that thinks **Q**
'What does John think that Mary bought?'

The null hypothesis, given what we have seen so far, would be that *-ka* is a marker of interrogative clauses (perhaps an interrogative complementizer) and that *nani* 'what' is a straightforward equivalent of the English *wh*-word *what*. However, it turns out that both *-ka* and *nani* appear in other, noninterrogative contexts (even together), with *prima facie* different functions.

Kuroda (1965) refers to Japanese *wh*-words like *nani* 'what', *dare* 'who' as "indeterminate pronouns" because they have a broader distribution than English *wh*-words. For example, they can appear as part of indefinites like *dare-ka* 'someone' in (6a), *nani-ka* 'something' in (6b).[5]

(6) a. **dare-ka**-ga hon-o katta.
who-Q-NOM book-ACC bought
'Someone bought books.'

b. John-ga **nani-ka**-o katta.
John-NOM **what-Q**-ACC bought
'John bought something.' (Kuroda 1965:97)

Notice too that in *dare-ka* 'someone', it is not only the *dare* part which is familiar from questions. Kim (1991:268) observes that the *-ka* in *dare-ka* "bears a striking resemblance to the question particle *-ka*." And, indeed, it does. In fact, Kuroda (1965), who presented the first systematic analysis of Japanese syntax within generative grammar, worked from the assumption that *-ka* in *dare-ka* and the *-ka* of interrogation should be identified as the same morpheme. We also adopt this premise here. The fact that the *-ka* in *dare-ka* and the *-ka* at the end of questions share the same morphology is presumed not to be a coincidence but rather an important fact about the syntax, semantics, and morphology of questions. Moreover, the data we will see in the upcoming sections from other, even unrelated, languages will support this assumption.

The *-ka* morpheme found in questions and in indefinites also appears in another non-interrogative context. As Kuroda (1965) observed, *-ka* can be used as a marker of disjunction (like English *or*) between nominal arguments (7a), or even between whole sentences (7b).

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[5] The connection between *wh*-words and indefinites has long been known, and is not a property exclusively of Japanese. Chomsky (1964) bases an argument for recoverability of deletion on an analysis of *who* in which it is formed from the same components as *someone*. Katz & Postal (1964), and Kuroda (1968) adopt essentially the same proposal. The evidence includes the observation that *someone* and *who* are both restricted to humans, while *something* and *what* are both restricted to inanimate objects; this leaves animate non-humans (e.g. animals) with neither a proper indefinite nor a proper *wh*-word. Katz & Postal (1964:93) point out that *else* can appear after *wh*-words like *who* (e.g., *who else saw Harry?*) and after the single word *some*-indefinites like *someone* (e.g., *someone else saw Harry*), but not after other things (**a man else saw Harry*, **he else saw Harry*, **the man else saw Harry*, **some people else saw Harry*); to their observation let me add that *else* is also possible after the single word *any*-items as well (e.g., *I didn't read anything else*) which suggests categorizing *anyone* with *who* and *someone*.

(7) a. John-**ka** Bill-(**ka**-)ga hon-o katta.
John-**Q** Bill-(**Q**-)NOM book-ACC bought
'John or Bill bought books.'

b. John-ga hon-o katta-**ka** Bill-ga hon-o katta-(**ka** desu).
John-NOM book-ACC bought-**Q** Bill-NOM book-ACC bought-(**Q** is)
'John bought books or Bill bought books.' (Kuroda 1965:85)

To strengthen the argument that *-ka* in each of the three contexts above are instances of the same morpheme, we observe that Japanese has a different morpheme, *-mo*, which appears in the same three environments as *-ka*. First, like *-ka* in *dare-ka*, *-mo* can appear attached to a *wh*-word as shown in (8). In a negative sentence, *daremo* has a meaning roughly like English negative polarity *anyone*, as in (8a–b). When followed by a case marker, *daremo* is interpreted as a universal quantifier, as in (8c).

(8) a. **dare-mo** hon-o kaw-anakat-ta.
who-MO book-ACC bought-NEG
'Noone bought books.'

b. John-ga **nani-mo** kaw-anakat-ta.
John-NOM **what**-MO bought-NEG
'John didn't buy anything.' (Kuroda 1965:93)

c. **dare-mo**-ga kita.
what-MO-NOM came
'everyone came.' (Kawashima 1994:147)

Like *-ka* in its role as 'or', *-mo* can be used a coordinator, with a meaning close to 'and'.[6] It can conjoin arguments (9a) or verb phrases in (9b).

(9) a. John-ga hon-**mo** zassi-**mo** katta.
John-NOM book-MO magazine-MO bought
'John bought both books and magazines.'

b. John-ga hon-o kai-**mo**-si, zassi-o kai-**mo** sita.
John-NOM book-ACC buy-MO-do magazine-ACC buy-MO did
'John bought books and John bought magazines.' (Kuroda 1965:77–8)

Finally, similar to the clause-final *-ka* we have seen in questions, we also find a clause-final *-mo* in the "concessive" *-te-mo* construction illustrated in (10). The clause-final position of *-mo* here is at least possibly the same as the position of *-ka* in questions.

(10) a. **dare**-ga ki-te-**mo** hookoku-si-te kudasai.
who-NOM come-MO report-do please
'Report to me if *x* comes, for all people *x*.'

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[6] I say "close to 'and'" because the particle *-to* (which can be used alone to mean 'with') can be used between phrases to mean 'and' as in *John-to Mary(-to)* 'John and Mary'. *John-mo Mary-mo* means something closer to 'both John and Mary'.

b. **dare**-ga ki-te-**mo**, boku-wa awa-nai.
who-NOM come-MO I-TOP meet-NEG
'Whoever may come, I will not meet (him).'

c. **dare**-ga **doko**-de **nani**-o kaw-te-**mo**, boku-wa kamawa-nai.
who-NOM **where**-at **what**-ACC buy-MO I-TOP care-NEG
'I don't care if x buys y at z, for all people x, things y, places z.'
(Nishigauchi 1991:204-8)

Here is what we have seen so far: A *wh*-question in Japanese involves a *wh*-word like *nani* 'what' and a clause-final particle *-ka*. We have seen that both *wh*-words and *-ka* are involved in other (non-interrogative) constructions, and that there is another particle, *-mo*, which has essentially the same distribution as *-ka*.

Under the assumption that the various occurrences of *-ka* represent instances of the *same* morpheme in different structural positions (and likewise for the various occurrences of *-mo*), we hope to find a consistent semantic contribution made by *-ka* and by the *wh*-words. This task will be taken up and explored carefully in chapters 5–7. In the intervening chapters, we continue to concentrate primarily on the distributional restrictions on *wh*-words and *-ka*.

3. Introduction to Sinhala questions

We now turn to look at question formation in Sinhala. In many respects question formation in Sinhala is very similar to question formation in Japanese, but with some additional properties which will prove to be tremendously informative. Sinhala is spoken in Sri Lanka, and is classified as an Indo-Aryan language (see Fairbanks, Gair, and De Silva 1968a, 1968b, MacDougall 1979, Reynolds 1995 for a grammatical overview of the language).[7] It appears to have a base word order of SOV, although (like Japanese) it has scrambling processes which can reorder words fairly freely. The following discussion of question formation in Sinhala is primarily based on the discussions and analysis of Gair (1970, 1983), Gair & Sumangala (1991), Sumangala (1992), and Kishimoto (1991, 1992, 1997).[8]

An example of a declarative sentence in Sinhala is given in (11). A *wh*-question formed by questioning the object is given in (12).[9] Sinhala, like Japanese, is a *wh*-in-situ

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[7] Sinhala speakers refer to their language as Sinhala [sɪŋələ] (සිංහල) in the language itself; historically, the language is also referred to as Sinhalese. In this thesis, we will be concerned only with colloquial Sinhala, which differs in certain respects from the literary form.

[8] There are slight discrepancies in the transliterations between these different sources, but I have not made any corrections or changes to the cited data (except if specifically noted). I have also occasionally altered the glosses provided based on comments from native speaker consultants. The most common transliteration in the cited works mainly follows the orthography, except with respect to the vowel "a" which, in contexts where vowel reduction applies, is transliterated as "ə" (this includes the vowel in the question marker *də*, which is orthographically "*da*" (ද)). A common discrepancy between cited sources is in the transliteration of one particular consonant (ව) sometimes written as "*w*" and sometimes as "*v*"; the surface realization is actually somewhere between English *w* and *v* (a "very lax fricative" according to Reynolds 1995:6).

[9] There is also another way to ask a *wh*-question in Sinhala which looks more like a cleft; in such questions, the *wh*-word is postposed to clause-final position as in (i). Note that the 'E' suffix survives under

(...continues) ➡

language; note that the *wh*-object *mokak* 'what' appears in the same position as the declarative object.

(11) gunəpaalə sinduvak kivva.
Gunapala a.song sang
'Gunapala sang a song.' (Sumangala 1991:230)

(12) Siri **mokak də** keruwe?
Siri **what Q** did-**E**
'What did Siri do?' (Gair & Sumangala 1991:93)

There are several features of (12) which are important to our discussion. First, notice that the part of the utterance corresponding to English *what* is comprised of two words, *mokak də*. Second, notice that the verb carries a suffix, glossed as 'E' (which generally surfaces as a verb-final "e", contrasting with declaratives like (11) which generally surface with a verb-final "a").[10] For reasons that will become clearer, we gloss the *də* morpheme as 'Q' (as we also glossed Japanese *-ka*).

In *wh*-questions, the 'E' suffix marks the interrogative clause with which the question word is associated. The "scope marking" function of 'E' is shown clearly in the examples in (13) below; in (13a), the 'E' suffix on the embedded verb yields an embedded question reading, while in (13b), the 'E' suffix on the matrix verb yields a matrix question reading.[11,12]

(continued...)
focus-postposing (unlike in other questions that end with *də*. See the discussion around (14)). Constructions like (i) will be discussed again briefly in chapter 2.
(i) Siri keruwe mokak də?
Siri did-E what Q
'What did Siri do?' (Gair & Sumangala 1991:93)

[10] As I understand it, the 'E' form of the verb (which Reynolds 1995:29, 44 refers to as the "incomplete form") does not occur in any other contexts (outside of questions and focus constructions as discussed in this section). In particular, it does not appear to be involved in the formation of relative clauses. This is noteworthy only because the corresponding construction in premodern Japanese (to be discussed below in section 4), uses the same verb form both pre-nominally in relative clauses and in these "discontinuous" question/focus constructions. The situation in Shuri Okinawan (see below, section 5) is perhaps more complex; see footnote 27.

[11] A note about the verb conjugation: To form the "incomplete form" ('E' form) of a verb in the past tense, the final *-a* is replaced by *-e*, as in *gatta/gatte* 'bought/bought-E'. When a verb ends in *-navaa* (=*-nəwa*) in the present tense, the infinitive ends in *-nna*. Replacing the final *-a* in the infinitive form with *-e* yields the incomplete form (which ends in *-nne*). The generalization is therefore that to form the incomplete form, we replace the final *-a* with *-e*, provided we take the incomplete present form to be based on the infinitive. The complementary distribution between "incompletive" *-e* ('E') and present tense morphology might indicate that they occupy the same morphological slot (different from the slot occupied by the past tense morphology), but this will not be our concern here.

[12] Rapti Dietrich (p.c.) tells me that she finds questions ending in "*danne?*" 'know' (like (13b)) unusual, and prefers a version where it ends in "*dannəwa də?*". It is not entirely clear to me why this is an option (cf. (17)), although it may be a dialectal difference. Also, as we will see below, there are certain *wh*-words which do allow for optionality between placement of *də* clause-internally vs. immediately following the verb. Cf. also footnote 15.

(13) a. Ranjit [**kau də** aawe kiyəla] dannəwa.
Ranjit **who Q** came-**E** that know
'Ranjit knows who came.'

b. Ranjit [**kau də** aawa kiyəla] danne?
Ranjit **who Q** came that know-**E**
'Who does Ranjit know came?' (Kishimoto 1997:6)

In yes-no questions, the 'Q' morpheme *də* can appear either as a clause-final particle, as shown in (14a), or attached to a focused constituent, as in (14b).[13]

(14) a. Chitra ee potə kieuwa **də**?
Chitra that book read **Q**
'Did Chitra read that book?'

b. Chitra **də** ee potə kieuwe?
Chitra **Q** that book read-**E**
'Did *Chitra* read that book?' (Kishimoto 1997:16)

Notice that when *də* is a clause-final particle, the 'E' suffix does not appear on the verb; in general, the scope of a Sinhala question is marked *either* by 'E' *or* by having *də* at the periphery of the interrogative clause, but not both. We will return to this observation in chapter 2.

The next examples give us our first glimpse at what will be a primary focus of this dissertation. In all the examples we have seen so far, *wh*-words in questions were immediately followed by *də*. However, under certain conditions, *də* can appear displaced from the *wh*-word. As Kishimoto (1997) observes, one such context is in the complement of a class of verbs which includes *dannəwa* 'know', *sækə-kərənəwa* 'doubt', and *parikʃaa-kərənəwa* 'look into' (but do *not* include *æhuwa* 'asked' and *kiiwa* 'said'). In (15), below, notice that *də* can appear either clause-internally, next to the *wh*-word (15a), *or* at the clause periphery (15b).[14,15]

(15) a. Ranjit [**kau də** aawe kiyəla] dannəwa.
Ranjit **who Q** came-**E** that know
'Ranjit knows who came.'

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[13] Kishimoto (1997) does not gloss (14b) with focus on the *də*-marked NP; however, Sumangala (1992) gives a similar example (i) which is glossed as below.
(i) Gunəpaalə də heṭə Gaalu yanne?
Gunapala Q tomorrow Galle go.pres-E
'Is it Gunapala who is going to Galle tomorrow?' (Sumangala 1992:131)

[14] Interestingly, the "peripheral" position is *inside* the complementizer *kiyəla*. We will discuss this further in chapter 4.

[15] When *kauru* 'who' is immediately followed by *də*, it shortens to *kau* (as in (15a)) (Fairbanks, Gair & De Silva 1968b:37). I assume this is nothing more significant than a morphophonological rule, given that there does not appear to be any comparable "*-ru*" form of any of the other *wh*-words in Sinhala; specifically, I assume that *kauru* is *not* bimorphemic. For at least one consultant I asked, *kauru* has a higher level of formality; as I understand it, in less formal speech *kaudə* can be substituted for *kauru* even with the question marker *də* appearing later in the question. I do not have anything interesting to say about this.

b. Ranjit [**kauru** aawa **də** kiyəla] dannəwa.
Ranjit **who** came **Q** that know
'Ranjit knows who came.' (Kishimoto 1997:6–7)

Notice also that the verb is marked with 'E' (15a) unless *də* is at the clause periphery (15b).

Under these verbs which allow *də* at the clause periphery, *də* can be separated from the *wh*-word by a considerable distance. As we can see in (16b), even a clause boundary can come between *də* and its associated *wh*-word.[16]

(16) a. mamə[Ranjit [Chitra **monəwa də** dækka kiyəla] kiiwe kiyəla] dannəwa.
I Ranjit Chitra **what Q** saw that said-**E**that know
'I know what Ranjit said that Chitra saw.'

b. mamə[Ranjit [Chitra **monəwa** dækka kiyəla] kiiwa **də** kiyəla] dannəwa.
I Ranjit Chitra **what** saw that said **Q** that know
'I know what Ranjit said that Chitra saw.' (Kishimoto 1997:19)

In general, placing *də* at the periphery of the interrogative clause is not an option with matrix *wh*-questions; these questions must have a clause-internal *də* and an 'E'-marked verb, as demonstrated by the contrast in (17).

(17) a. * **kauru** ee potə kieuwa **də**?
who that book read **Q**
('Who read that book?') (Kishimoto 1997:14)

b. **kau də** ee potə kieuwe?
who Q that book read-**E**
'Who read that book?' (Kumara Henadeerage, Dileep Chandralal, p.c.)

There are a few *wh*-words for which this does not hold, however, including *kiidenek* 'how many (animate)', *kiiyek* 'how many (inanimate)' and *koccərə* 'how much' (Gair & Sumangala 1991:97). These *wh*-questions *do* allow the alternation between 'E'-marking and clause-peripheral *də*, as in (18) and (19) below.[17]

(18) a. **kiidenek** enəwa **də**?
how.many come **Q**
'How many (animate) are coming?'

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[16] An interesting fact about (16b) is that, although the intermediate verb *kiiwa* 'said' does not allow *də* to appear at the periphery of its own complement, the relation between the *wh*-word and *də* can "escape" the complement of *kiiwa* to attach higher, to the complement of *dannəwa* 'know' (which *does* allow *də* at the periphery of its complement).

[17] Sumangala (1992:248) suggests that questions involving *wh*-words like *koccərə* 'how much' have a more focused meaning. As I understand it, the cases of optionality we saw before (involving verbs in the same class as *dannəwa* 'know', e.g. (15)) show no (or perhaps only a very subtle) difference in meaning between clause-internal *də* and clause-peripheral *də*. This might suggest that *koccərə*-type questions are more parallel to yes-no questions than to the *wh*-questions we primarily consider in this thesis. No real attempt has been made to analyze *koccərə*-type questions here.

b. **kiidenek də** enne?
how.many Q come-**E**
'How many (animate) are coming?' (Kishimoto 1997:8)

(19) a. salli **koccərə** dunna **də**?
money **how.much** gave **Q**
'How much money did (you) give?'

b. salli **koccərə də** dunne?
money **how.much Q** gave-**E**
'How much money was it that (you) gave?' (Sumangala 1992:248)

As has been commented on above, the 'E' morphology on the verb only appears when *də* is clause-internal (as we see in (14–16) and (18–19)). There seems to be a relation between the *də* morpheme and the periphery of the interrogative clause in Sinhala questions. In every case, either *də* itself is at the edge of the interrogative clause or the 'E' morphology marks the scope of interrogation. The fact that the 'E' morphology disappears when *də* is at the clause periphery suggests that 'E', when it appears, is somehow "standing in" for *də* at the point of interrogative scope.[18]

Interestingly, when the connection to the clause periphery is severed by omitting the 'E' morphology, the sentence loses its interrogative meaning. Instead (much like what we saw previously when discussing Japanese *-ka*), we find that when *də* is clause-internal and the verb is not marked with 'E', a *wh*-word is interpreted as an indefinite (20a). This declarative forms a minimal pair with (20b), which is a question, and differs only in that the verb bears the 'E' suffix.

(20) a. **mokak də** wætuna.
what Q fell
'Something (unidentified) fell.' (Gair & Sumangala 1991:104)

b. **mokak də** wætune?
what Q fell-**E**
'What fell?' (Kumara Henadeerage, Dileep Chandralal, p.c.)

This strongly suggests that the *də* particle in Sinhala corresponds to the *-ka* particle in Japanese.[19]

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[18] Or, to put it in a way which is closer to the analysis we will propose in chapter 2, 'E' is *deleted* (by *də*) when *də* is at the clause periphery.

[19] Also, Sinhala *-t* (-ත්) seems to closely correspond to Japanese *-mo*, which increases the plausibility of identifying Sinhala *də* with Japanese *-ka*. Like Japanese *-mo*, Sinhala *-t* means 'also' when suffixed to a noun (Fairbanks, Gair & De Silva 1968a:197), forms universals when suffixed to *wh*-words (Fairbanks, Gair & De Silva 1968a:229), and forms clausal conjunctions (Fairbanks, Gair & De Silva 1968a:212)—although noun conjunctions are formed by a different particle, *-yi* (ඉ) (Fairbanks, Gair & De Silva 1968a:105, MacDougall 1979[vol.3]:86–7). Kishimoto (1992) gives the following examples which contain a *wh*-word suffixed with *-t* which takes on universal force.

(i) Chitra kauru-t ekkə kataa kəlaa.
Chitra who-T with talk did
'Chitra talked with everyone.'

(...continues) ➡

It appears that what makes an utterance in Sinhala a question is the *connection* between the question particle *də* and the periphery of the interrogative clause (where this "connection" is allowed to be vacuous, e.g., in (14a), where *də* is actually *at* the periphery). The nature of this connection will be the subject of the next chapter.

Before leaving this section, it is worth noting that the 'E' morphology is not limited to questions. It also appears in declarative sentences like those in (21) which contain a focused element. Notice that, as in questions, the focus particle can either appear clause-internally (21a) or clause peripherally (21b). When the focus particle is clause-internal, the 'E' morphology surfaces on the verb; when the focus particle is clause-peripheral, no 'E' morpheme appears. Kishimoto (1997) points out (citing Gair 1983) that even when the focus particle is clause peripheral (21b), an interpretation like (21a) is still possible, where *ee potə* 'that book' is focused.[20]

(21) a. Chitra ee potə **tamay** kieuwe.
Chitra that book **FOC** read-**E**
'It was *that book* that Chitra read.'

b. Chitra ee potə kieuwa **tamay**.
Chitra that book read **FOC**
'It was *that book* that Chitra read.'
'It was *read that book* that Chitra did.'
'It was *read* that Chitra did with that book.'
(Kishimoto 1997:13–14, Kumara Henadeerage, p.c.)

The parallel between questions and focus constructions can be seen in their scope-marking properties as well; (22) shows that 'E' marks the clause at which the focus is interpreted (like the scope marking in questions we saw in (13)).

(continued...)

(ii) Ranjit kaurun-ṭe-t gæhuwa.
Ranjit who-DAT-T hit
'Ranjit hit everyone.' (Kishimoto 1992:55)

The suffix *-vat* (-වත්) (which, as Reynolds 1995:259 indicates, takes the place of *-t* in negative sentences) forms negative polarity items when suffixed to *wh*-words (de Abrew 1981:17, 59; Fairbanks, Gair & De Silva 1968a:216, MacDougall (1979[vol.3]:89), which must appear in the same tensed clause as negation excepting bridge verbs (de Abrew 1981:59) (cf. Japanese "clausemate condition" on NPI's). An example is given in (iii).

(iii) a. miniha mokak-də gatta.
man(def.) what-Q took
'The man took something.'

b. miniha mokak-vat gatte nææ.
man(def.) what-T took-E NEG
'The man did not take anything.' (De Abrew 1981:17)

MacDougall's (1979[vol.3]:89) examples are කොහේවත් *kohee-vat* 'where-*vat*' meaning 'anywhere/somewhere' and කොහොමවත් *kohomə-vat* 'how-*vat*' meaning 'anyhow/somehow' and can also be used (as *-vat...-vat*) to mean 'neither...nor' (in a negative sentence—probably parallel to *-mo...-mo* in a negative Japanese sentence). My guess is that *kauru-vat* corresponds to *daremo* and *kauru-t* corresponds to *daremo-ga*. Also note, Sinhala *-vat* when suffixed alone to something in a negative sentence means 'even', while *-t* means 'either' (which I take to mean 'also not...') (Reynolds 1995).

[20] Kishimoto (1997) glosses (21a) as 'It was that book that Chitra read' and (21b) as 'Certainly, Chitra read that book.' He does indicate that both have a meaning where *that book* is focused, so I glossed them in a way which brings this out.

(22) a. Ranjit [Chitra ee potə **tamay** kieuwa kiyəla] kiiw**e**.
Ranjit Chitra that book FOC read that said-**E**
'It was that book that Ranjit said that Chitra read.'

b. Ranjit [Chitra ee potə **tamay** kieuwe kiyəla] kiiwa.
Ranjit Chitra that book FOC read-**E** that said
'Ranjit said that it was that book that Chitra read.' (Kishimoto 1997:13)

To summarize where we are, we have seen that a question meaning results when the particle *də* is connected to the periphery of a clause in Sinhala, either by being at the clause periphery itself or via the 'E' marking on the verb. We have also seen that the 'E' morphology which can connect *də* to the clause periphery plays essentially the same role in questions and in focus constructions. Further, we have seen that *də*, like *-ka* in Japanese, can be used with *wh*-words to form indefinites when *də* is not connected to the clause periphery.

4. Historical interlude: Premodern Japanese *kakari-musubi*

Japanese, historically, had a construction which is very much like the focus/question construction discussed above in Sinhala. The construction is traditionally referred to as *kakari-musubi*, and generally involves a clause-internal particle (the *kakari* 'relating' particle) and a correlated marking on the associated predicate (*musubi* 'tying up').

Premodern Japanese had several particles which participated in the *kakari-musubi* construction. Of particular interest is the interrogative particle *-ka*, but there were other particles (generally emphatic) as well, including *-koso*, *-zo*, and *-namu*. Discussions of this phenomenon can be found in Ogawa (1976, 1977), Sansom (1928), Whitman (1997), Miyagawa (1989), and Yanagida (1995), to name just a few.

A straightforward example is given below in (23a–b).[21] Notice that the *kakari*-particle *-ka* is suffixed directly to the *wh*-word *tare* 'who', and the verb is in a special form. The gloss reflects the special form (the "adnominal form") with "M" (for *musubi*).[22]

(23) a. sisi husu-to **tare-ka** kono koto oomae-ni maos**u**.
beast lie-QUOT **who-Q** this thing Emperor-DAT say-**M**
'Who reported to the Emperor that beasts were lying?'
(*Nihon Shoki* [720]:75, Ogawa 1977:221)

b. **tare-ka** mata hanatatibana-ni omoi-idem**u**.
who-Q again flower.orange-DAT remember-**M**
'Who will again remember (me) at the time of the mandarin orange flower?'
(*Shin Kokin Wakashū* [1205]:3, Ogawa 1977:222)

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[21] Ogawa (1977:221–222) gives Moriyama (1971:32) as the source for example (23a), Ōtsuki (1897:294) as the source for example (23b).

[22] Normally, a sentence would end with a verb in "completive" form, the adnominal form of the verb being used in relative clauses to connect it to an external head noun. Outside of *kakari-musubi*, the adnominal form of the verb does not end sentences in premodern Japanese (at least historically prior to the collapse of the distinction between adnominal and completive forms).

Premodern Japanese also used the *kakari-musubi* construction for emphasis as well (cf. the Sinhala examples above in (21–22)). Whitman (1997) provides a fine example from the *Ise monogatari* [900] which contains both a focus construction with *-koso* and a *wh*-question.[23] When *-koso* is used, the verb must take a particular form (*izenkei*, conditional) which differs both from the normal completive (*shūshikei*) form and from the adnominal (*rentaikei*) form required for *-ka*.

(24) tire-ba-**koso** itodo sakura-wa medeta-**kere**
fall-cond-**EMPH** the.more cherry-TOP wonderful-**M**
uki.yo-ni **nani-ka** wisasi-karu bek-**i**.
sad.world-DAT **what-Q** long-V should-**M**
'It is because they fall that cherry blossoms are so fine;
in this woeful world what should be longlasting?'
(*Ise monogatari* [900]:82, Whitman 1997:162)

Both *-koso* and *-ka* have survived to modern Japanese; as we have seen earlier in this chapter, *-ka* in questions is now found clause-finally, and *-koso* still appears clause-internally. However, there is no longer any morphological distinction between verbs associated with *-koso* and verbs that are not. We will revisit *-koso* in modern Japanese later, in chapter 4.

We will discuss premodern Japanese *kakari-musubi* in more detail in chapter 2. The main purpose of this section was to point out that we need not look as far away as Sinhala to find morphological patters that correspond to what we proposed for modern Japanese; we find them in Japanese's past as well.

5. A brief introduction to Shuri Okinawan *kakari-musubi*

We will now turn our attention to a fourth language, very close in structure to both Japanese and Sinhala and particularly to premodern Japanese. The language we will be concerned with here is Shuri Okinawan (or Ryūkyūan, hereafter referred to just as "Okinawan"), spoken around Shuri in the prefecture of Okinawa. Question formation in Okinawan has been addressed by Miyara (1998), Sugahara (1996), Whitman (1997), and Yanagida (1995), and the following discussion draws significantly upon the discussions there. Modern Okinawan shares with premodern Japanese the *kakari-musubi* construction discussed in the previous section. Due to its heritage and to the fact that it has primarily been studied by Japanese linguists, Okinawan is described using the same terminology used for premodern Japanese; thus, the clause-internal question/focus particle is referred to as the *kakari*-particle, and the corresponding verbal inflection is referred to as *musubi*. The purpose of this section is to introduce the broad characteristics of (this particular type of) question formation in Okinawan. Because the interrogative *kakari* particle *-GA* has the same phonological shape as the nominative case marker, it is set in small caps in order to help distinguish it from the nominative marker.

[23] I simplified certain aspects of Whitman's glossing, and rendered his "ϕ" as "w" for parallelism with other premodern Japanese examples.

In Okinawan (as in premodern Japanese), the interrogative *kakari*-particle *-GA* can be attached to *wh*-phrases and focus phrases, and co-occurs with a particular verbal marking. Examples of questions involving *kakari-musubi* in Okinawan are given in (25), where the *kakari* morpheme is glossed as 'Q' (following the convention from previous sections and anticipating the identification of the *kakari* 'Q' with Sinhala *də* and Japanese *-ka*), and the *musubi* morpheme is glossed as 'M'.[24,25,26]

(25) a. wan-ya [Taruu-ga **nuu**-GA kam-yi-**ra**] chichibusaN.
I-TOP Taru-NOM **what-Q** eat-PRES-**M** want-to-hear
'I want to hear what Taru eats.'

b. wan-ya [**taa**-ga-GA ringo kam-yi-**ra**] chichibusaN.
I-TOP **who**-NOM-**Q** apple eat-PRES-**M** want-to-hear
'I want to hear who eats apples.' (~Sugahara 1996:236-7)

In embedded questions, question words like *nuu* 'what' or *taa* 'who' are marked with the *kakari* morpheme *-GA*, and the verb is marked with *ra*, the *musubi* morpheme for *-GA*. In light of the preceding discussion of Sinhala, we can (at least tentatively) identify the *kakari* morpheme with Sinhala *də* and the *musubi* morpheme with Sinhala's scope marking focus suffix 'E'.

As in Sinhala and in premodern Japanese, there is a focus construction in Okinawan which also makes use of the *kakari-musubi* form, shown in (26), where the focus morpheme is glossed as 'EMPH'. The phonological shape of the morphemes are different in the focus form and in the *wh*-question form, but the relationship between them appears to be essentially the same.[27]

(26) a. Taruu-ya shishi-**ru** kam-yi-**ru**.
Taru-TOP meat-**EMPH** eat-PRES-**M**
'It is meat that Taru eats.'

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[24] Shinsho Miyara (p.c.) indicates that the *kakari* (*-GA*) morpheme is emphatic and can be used (in conjunction with a *musubi -ra*) even in yes-no questions like (i). Recall that a similar construction is possible in Sinhala yes-no questions, cf. (14b).

(i) John-ga-GA ringo kamu-ra
John-NOM-Q apple ate-M
'(I wonder if) it was John that ate an apple.' (Shinsho Miyara, p.c.)

[25] I have made certain minor changes to Sugahara's Okinawan examples, based on comments from Shinsho Miyara (p.c.).

[26] The "~" in the source citations is meant to indicate that I have made slight changes to the example from its actual form in the cited source.

[27] The adnominal form (ending in *-ru*) does participate in certain *kakari-musubi* constructions (e.g., in (26)), historically related to the emphatic construction with *-zo* in premodern Japanese. However, the verb form (ending in *-ra*) that appears with the *kakari*-particle *-GA* does not ever function adnominally. Leon Serafim (p.c.) tells me that the verb ending *-ra* in Okinawan is probably related to premodern Japanese *-ramu* (which Ogawa 1976:195 calls an "auxiliary verb of inference" with an adnominal ending). That is, the *musubi* ending *-ra* is probably historically adnominal, but it does not have this function synchronically. What bearing this has on the proper synchronic analysis of Okinawan is not completely clear. Many thanks to Leon Serafim (p.c.) for discussing this with me.

b. Taruu-ga-**ru** shishi kam-ta-**ru**.
Taru-NOM-**EMPH** meat eat-PAST-**M**
'It is Taru that ate meat.' (Sugahara 1996:236)

So far, Okinawan and Sinhala appear to be essentially isomorphic. If we directly identify the Okinawan *kakari* morpheme with the Sinhala question marker *də* and the Okinawan *musubi* morpheme with the Sinhala scope marking focus suffix 'E', we can correctly predict the patterns of Okinawan *kakari-musubi* from what we know about Sinhala. There are some interesting differences, however. One respect in which the languages differ is that in Okinawan only embedded questions display the *kakari-musubi* marking.[28] Matrix questions take a different form like that shown in (27), with no marker on the *wh*-word and a verb suffix indicating that it is a question.

(27) a. Taruu-ya **nuu** kam-yi-GA?
Taru-TOP **what** eat-PRES-**Q**
'What does Taru eat?' (Sugahara 1996:236)

b. **taa**-ga ich-u-GA?
who-NOM go-PRES-**Q**
'Who will go?' (Miyara 1998:32)

Sugahara (1996:236) points out that the sentence-final particle is phonologically identical to the *kakari* morpheme in embedded *wh*-questions. We will suppose that it is in fact the same morphological element.

Although there are other differences between Okinawan, Japanese, and Sinhala, we will discuss them in later sections when they become relevant.[29]

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[28] There is potentially an issue about what counts as an "embedded question." It appears to be possible to leave all evidence of the matrix clause silent, implying '(I wonder)'. Sugahara (1996) glossed her examples as if this were the case, and I will assume this here as well. Shinsho Miyara (p.c.) characterizes these matrix-like *kakari-musubi* questions as self-directed questions, which I believe amounts to the same thing. Nishigauchi (1990:19) notes that such sentences in Japanese are possible (with a marked intonation) (e.g. *John-ga kuru ka-dooka* [John-NOM come whether] '(I wonder) whether John will come'), but Shinsho Miyara (p.c.) tells me that this construction is quite marked in Japanese. Kishimoto (1997:59) reports a matrix question with *də-nædda* in Sinhala (*Chitra yanəwa də-nædda?* [Chitra go whether] 'Is Chitra going or not?'), although note that he did not gloss it as having a covert 'I wonder' meaning.

[29] One difference between Okinawan and the other languages is that yes-no questions are marked with a question marker that differs from the one that occurs with *wh*-questions. While we have seen that *wh*-questions employ the morpheme *-GA*, yes-no questions, by contrast, either employ *-mi* (in affirmative questions) or *-ni* (in yes/no questions containing a negative morpheme) (Miyara 1998). There are other morphological issues that need to be addressed for Okinawan as well; it appears that there is a correlate of Japanese *daremo* 'anyone/everyone' in Okinawan, formed by suffixing *-n* to a *wh*-word (e.g., *taa* 'who', *taa-n* 'anyone/everyone'), but indefinites seemed to be formed not by suffixing *-GA* to a *wh*-word (which is what we would expect by the parallel to Japanese and Sinhala), but rather by suffixing *-gana* to a *wh*-word (e.g., *taa-gana* 'someone'). Shinsho Miyara (p.c.) tells me that *-gana* sometimes appears clause-finally, but with a meaning that is less than fully clear; he also indicated that *-na* can appear alone clause-finally with a meaning and distribution much like Japanese *-ne* or Canadian English *eh*? Presumably the indefinite-forming *-gana* can be analyzed as *-GA* (Q) and *-na* (?), but the details still need to be worked out. I also have no information about how disjunction is formed in Okinawan (recall that Japanese *-ka* forms disjunctions, and Sinhala *də* functions disjunctively in alternative questions).

Chapter 2 Q-movement

In this chapter, we look closely at the syntactic properties of the 'Q' morpheme (*-ka* in Japanese, *də* in Sinhala, *-GA* in Okinawan), and conclude that in all three languages Q is base-generated clause-internally and moves to the clause periphery (either overtly or covertly). This is supported by island effects and by "intervention" effects that arise when trying to move Q over certain other morphemes.

1. Movement of *də* to the clause periphery in Sinhala

Kishimoto (1992) presents a strong case for the view that the connection between *də* and the clause periphery in *wh*-questions marked with 'E' is established by movement. We will review his argument here. The argument is based primarily on the fact that in grammatical *wh*-questions *də* cannot be contained within a syntactic island. This leads us to two important conclusions. First, assuming that islands diagnose movement relations, it implies that *də* undergoes movement (from its overt position to the clause periphery).[1] Second, since this movement is not visible in the surface form, "covert" movement must also obey movement islands.[2]

We begin by observing that a *wh*-word and *də* cannot appear inside a Complex Noun Phrase island, as shown in (1a). In this example, *də* is separated from the 'E' marker by the boundary of a Complex Noun Phrase ("CNP") and the result is ill-formed. Instead, the question can be asked as in (1b), where the *wh*-word *kauru* 'who' remains inside the CNP, but the Q morpheme *də* sits just outside the island. I provide the English glosses with the *wh*-word in situ, although in Sinhala the questions are normal, non-echo questions.

(1) a. * oyaa [**kau** **də** liyəpu potə] kieuwe?
you **who** **Q** wrote book read-**E**
('You read the book that who wrote?')

b. oyaa [**kauru** liyəpu potə] **də** kieuwe?
you **who** wrote book **Q** read-**E**
'You read the book that who wrote?' (Kishimoto 1992:56)

The same point is made by (2) and (3), which have the *wh*-word in direct and indirect object position, respectively.

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[1] On the topic of islands as diagnostics of movement, see Ross (1967).

[2] The conclusion that the island-sensitive movement is covert only follows if it is *not* the 'E' marker that moves. Much of the discussion in this section cannot distinguish between overtly moving 'E' from the position of *də* and covertly moving *də* to the position of 'E'. There are certain facts which point strongly toward *də*-movement, however. Aside from the evidence from analogy to Japanese, the fact that 'E' only appears if *də* is clause-internal (see section 2) would be difficult to explain if it is 'E' that is the active, moving element. Thanks to Howard Lasnik (p.c.) for bringing this to my attention.

(2) a. * Chitra [Ranjit **monəwa** ə gatta kiənə kaṭəkataawə] æhuwe?
Chitra Ranjit **what** **Q** bought that rumor heard-**E**
('Chitra heard the rumor that Ranjit bought what?')
(Kishimoto 1997:33)

b. Chitra [Ranjit **monəwa** gatta kiənə kaṭəkataawə] **də** æhuwe?
Chitra Ranjit **what** bought that rumor **Q** heard-**E**
'Chitra heard the rumor that Ranjit bought what?' (Kishimoto 1997:39)

(3) a. * oyaa [Chitra **kaa**-ṭe **də** dunnə potə] kieuwe?
you Chitra **who**-DAT **Q** gave book read-**E**
('You read the book that Chitra gave to whom?') (Kishimoto 1997:33)

b. oyaa [Chitra **kaa**-ṭe dunnə potə] **də** kieuwe?
you Chitra **who**-DAT gave book **Q** read-**E**
'You read the book that Chitra gave to whom?' (Kishimoto 1997:39)

The generalization that these facts suggest is (4), a generalization which describes the expected behavior if *də* moves to the clause-peripheral position (marked by 'E') before interpretation.

(4) **Generalization**: (In a single question where *də* is not *at* the clause periphery) *də* must be as close (hierarchically) to the *wh*-word as it can be without being separated from the associated interrogative clause periphery by an island boundary.

The generalization in (4) holds not only for CNP islands but also for other known movement islands as well, examples of which are given in a moment. The generalization is illustrated schematically in (5) for cases where a *wh*-word is inside an island. Q (i.e. *də*) cannot appear inside the island (5a) but can appear outside the island (5b) although not farther away (5c).

(5) a. * ... [$_{\text{island}}$ ... *wh*-word Q ...] ... V-E ?
b. ... [$_{\text{island}}$ ... *wh*-word ...] Q ... V-E ?
c. * ... [$_{\text{island}}$ ... *wh*-word ...]... Q ... V-E ?

In (6) and (7) we see that *də* cannot be separated from the clause periphery by an adjunct island, and in (8), by a *wh*-island. In (9) and (10), we see that *də* cannot be extracted from the possessor position of a DP. In (11), we see that it cannot move from inside a postpositional phrase. In each case, however, while the question is bad with *də* inside the island, a good version of the question can be formed by placing the *də* just outside the offending island.

(6) a. * [**kau** **də** enə koṭə] Ranjit paaḍam kəramin hiṭie?
who **Q** came time Ranjit study doing was-**E**
('Ranjit was studying when who came?')

b. [**kauru** enə koṭə] **də** Ranjit paaḍam kəramin hiṭie?
who came time **Q** Ranjit study doing was-**E**
'Ranjit was studying when who came?' (Kishimoto 1992:58)

(7) a. * [Chitra **monəwa də** kanə koṭə] Ranjit pudumə unee?
Chitra **what Q** ate when Ranjit surprise became-**E**
('Ranjit was surprised when Chitra ate what?') (Kishimoto 1997:33)

b. [Chitra **monəwa** kanə koṭə] **də** Ranjit pudumə unee?
Chitra **what** ate when **Q** Ranjit surprise became-**E**
'Ranjit was surprised when Chitra ate what?' (Kishimoto 1997:39)

(8) a. ?* Ranjit [Chitra **monəwa də** kieuwa **də-næddə** kiyəla] danne?
Ranjit Chitra **what Q** read **whether** that know-**E**
('Ranjit knows whether Chitra read what?')

b. ? Ranjit [Chitra **monəwa** kieuwa **də-næddə** kiyəla] **də** danne?
Ranjit Chitra **what** read **whether** that **Q** know-**E**
'Ranjit knows whether Chitra read what?'
(Kishimoto 1997:33,40, Dileep Chandralal, p.c.)

(9) a. * Ranjit [**kaa**-ge-**də** potə] kieuwe?
Ranjit **who**-GEN-**Q** book read-**E**
('Ranjit read whose book?')

b. Ranjit [**kaa**-ge potə] **də** kieuwe?
Ranjit **who**-GEN book **Q** read-**E**
'Ranjit read whose book?' (Kishimoto 1992:60–1)

(10) a. * [**kaa**-ge-**də** potə] wæḍipurə kiewenne?
who-GEN-**Q** book often is.read-**E**
('Whose book is often read?')

b. [**kaa**-ge potə] **də** wæḍipurə kiewenne?
who-GEN book **Q** often is.read-**E**
'Whose book is often read?' (Kishimoto 1992:60–1)

(11) a. * Chitra [**kohee də indan**] enne?
Chitra **where Q from** come-**E**
('From where did Chitra come?')

b. Chitra [**kohee indan**] **də** enne?
Chitra **where from Q** come-**E**
'From where did Chitra come?' (Kishimoto 1992:54–5)

Regardless of what allows *də* to appear outside the islands instead of on the *wh*-word, these facts strongly suggest that a movement relation exists between *də* and the clause periphery.

As for the part of generalization (4) requiring *də* to be as close to the *wh*-word as possible, the examples below (which continue the paradigm from (6)) show that *də* cannot appear anywhere but at the edge of the island.

(12) a. * [**kauru** enə koṭə] Ranjit **də** paaḍam kəramin hiṭie?
who came time Ranjit **Q** study doing was-**E**
('Ranjit was studying when who came?')

b. * [**kauru** enə koṭə] Ranjit paaḍam **də** kəramin hiṭie?
who came time Ranjit study **Q** doing was-**E**
('Ranjit was studying when who came?')

c. * [**kauru** enə koṭə] Ranjit paaḍam kəramin **də** hiṭie?
who came time Ranjit study doing **Q** was-**E**
('Ranjit was studying when who came?') (Dileep Chandralal, p.c.)

The data above support the view that *də* marks a position from which island-sensitive covert movement must take place, since a question with a *wh*-word inside an island is well-formed only when *də* is generated in a position *outside* the island.

In chapter 1, we saw that there is evidence for a relation between *də* and the clause periphery in Sinhala questions. In this section, we have seen that this relation is not allowed to cross movement islands. That is, the relation between *də* and the clause periphery seems to be a *movement* relation. In the upcoming sections, we will turn to address the question of exactly *what* is moving; first, we will clarify a couple of points about the 'E' morpheme in Sinhala questions.

2. Feature checking and the distribution of Sinhala 'E'

We saw in chapter 1 that the 'E' suffix in Sinhala seems to serve a "scope marking" function. In questions, it appears on the verb heading the clause with which *də* is associated. Sometimes, however, the 'E' in questions disappears. Specifically, no 'E' surfaces in cases where the *də* is overtly *at* the clause periphery, as in (13) below. Where *də* is clause internal, the embedded verb is marked with 'E', but where *də* is clause peripheral (that is, postverbal), there is no 'E' suffix.[3]

(13) a. Ranjit [**kau də** aawe kiyəla] dannəwa.
Ranjit **who Q** came-**E** that know
'Ranjit knows who came.'

b. Ranjit [**kauru** aawa **də** kiyəla] dannəwa.
Ranjit **who** came **Q** that know
'Ranjit knows who came.' (Kishimoto 1997:6–7)

Recall too (from chapter 1) that this 'E' suffix is not specific to interrogatives. In particular, it also appears in focus constructions, such as (14).

[3] I have been using (and will continue to use) the term "clause periphery." This is done to abstract away from the actual *identity* of the (functional) projection to which Q moves. This projection might be simply an interrogative complements (as is in fact assumed for terminological simplicity in chapters 5–7). There is some reason to think it might be a projection *below* the declarative complementizer; e.g., notice that *də* appears to move to a position just under *kiyəla* in (13b). Exactly what syntactic projection this is need not divert us here, hence the use of the noncommittal term "clause peripheral."

(14) a. Chitra ee potə **tamay** kieuwe.
Chitra that book **FOC** read-**E**
'It is that book that Chitra read.'

b. Chitra ee potə kieuwa **tamay**.
Chitra that book read **FOC**
'It is that book that Chitra read.' (Kishimoto 1997:13–14)

Both in the interrogatives and in the focus constructions, as illustrated above, the 'E' suffix appears only when the particle (*də* or *tamay*) is not already suffixed to the verb. This suggests that the 'E' suffix is a morphological reflection of an "unsatisfied property" of the surface representation. 'E' reflects a feature which is "checked" or "satisfied" by the movement of the focus or interrogative particle to the clause periphery. If this movement has not taken place overtly, 'E' appears, indicating that the movement is "yet to occur," i.e. occurs covertly.[4] This is stated explicitly in (15).

(15) Sinhala 'E' indicates an unchecked feature.
Focus/interrogative particles can check this feature (via movement).

The unsatisfied property marked by 'E' is only resolved by a suffixation of the focus/question particle to the verb.[5]

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[4] Movement of focus particles appears, then, to be *optionally* overt (e.g., in (14)). At this point, I do not know if there is any observable semantic/pragmatic difference between the cases where the focus particle is clause-internal and where it is clause-peripheral. As discussed in chapter 1, although movement of the question particle *də* is obligatorily *covert* for most *wh*-words, there are certain cases where movement of *də* seems to show the same sort of optionality as focus movement. Specifically, in yes-no questions and in *wh*-questions involving amount-type *wh*-words like *kiidenek* 'how many', *də* may appear either clause-internally or clause-peripherally. As mentioned in a footnote in chapter 1, when *də* is clause-internal in these cases, the constituent with which it is associated appears to receive emphasis compared to when *də* is clause-peripheral. I must leave investigation into what governs the choice of overt movement over covert movement for another time.

[5] Even if the particle is *clause*-final, 'E' only disappears if the particle is adjacent to the *verb*. In this connection, consider the "pseudo-cleft" construction in (i) and (ii) discussed by Gair & Sumangala (1991) and Kishimoto (1997). The (a) examples have the question or focus constituent in situ, while the (b) examples have this entire constituent (not just the question/focus particle) postposed to the end of the sentence. The 'E' suffix appears in both cases.

(i) a. Siri [mokak **də**] keruwe?
Siri what **Q** did-**E**
'What did Siri do?'

b. Siri keruwe [mokak **də**]?
Siri did-**E** what **Q**
'What did Siri do?' (Gair & Sumangala 1991:93)

(ii) a. Siri [wa̤duwæ̤də **tamayi**] keruwe.
Siri woodworking **EMPH** did-**E**
'It was indeed woodworking that Siri did.'

b. Siri keruwe [wa̤duwæ̤də **tamayi**].
Siri did-**E** woodworking **EMPH**
'It was indeed woodworking that Siri did.' (Gair & Sumangala 1991:94)

Gair & Sumangala (1991) analyze (ib) and (iib) as biclausal clefts, which is made more plausible by the fact that Sinhala generally allows copular sentences without any overt predicating element. This would mean (iib) has a structure something like (iii).

(iii) [Siri e_i keruwe] COP [mokak də]$_i$

(...continues) ➠

Notice too that the generalizations about questions discussed in the previous section also hold of the focus constructions involving the 'E' morpheme. In particular, just as the question marker *də* cannot appear separated from the 'E' marked verb by an island boundary, neither can focus particles like *tamay*.

(16) a. * oyaa [Chitra Ranjit-ṭə **tamay** dunnə potə] kieuwe.
you Chitra Ranjit-DAT **EMPH** gave book read-**E**
('It was to Ranjit$_i$ that you read the book that Chitra gave t_i.')

b. * Chitra [Ranjit ee potə **tamay** gatta kiənə kaṭəkataawə] æhuwe.
Chitra Ranjit that book **EMPH** bought that rumor heard-**E**
('It was that book$_i$ that Chitra heard the rumor that Ranjit bought t_i.')

c. * [Chitra maalu **tamay** kanə koṭə] Ranjit pudumə unee.
Chitra fish **EMPH** ate when Ranjit surprise became-**E**
('It was fish$_i$ that Ranjit was surprised when Chitra ate t_i.')
(Kishimoto 1997:38)

Again like the cases with interrogative *də*, if the focus particle *tamay* appears just *outside* the island, the sentence is grammatical.

(17) a. oyaa [Chitra Ranjit-ṭə dunnə potə] **tamay** kieuwe.
you Chitra Ranjit-DAT gave book **EMPH** read-**E**
'It was the book which Chitra gave to Ranjit that you read.'

b. Chitra [Ranjit ee potə gatta kiənə kaṭəkataawə] **tamay** æhuwe.
Chitra Ranjit that book bought that rumor **EMPH** heard-**E**
'It was the rumor that Ranjit bought that book that Chitra heard.'

c. [Chitra maalu kanə koṭə] **tamay** Ranjit pudumə unee.
Chitra fish ate when **EMPH** Ranjit surprise became-**E**
'It was when Chitra ate the fish that Ranjit was surprised.'
(Kishimoto 1997:41)

From the same generalizations, the same conclusions apply; there must be some kind of movement from the position of the focus particle to the position marked by 'E'.[6]

(continued...)

It remains an open question how precisely the 'E' feature is eventually checked in these types of sentences, but nothing we will be concerned with here seems to hang on the answer to this question, so we will leave it unaddressed. We will return to this construction briefly in chapter 4, where it will be compared to a possibly parallel construction in Malay.

[6] There is one place where the focus construction and *wh*-constructions appear to differ. Gair & Sumangala (1991) observe a difference in their behaviors in Weak Crossover environments. They give the examples in (i), where a *wh*-question forbids coreference but a focused element does not. I have no good explanation for this at the moment, although it is worth noting that the examples in (i) are of the "pseudo-cleft" variety discussed in footnote 5, which might be contributing complications. However, notice that the same seems to hold for English, assuming in that English clefts are appropriate glosses in (i).

(i) a. eyaage$_i$ amma dække kau$_{*i/j}$ də?
(s)he-GEN mother saw-E who Q
'Who$_i$ was it that his/her$_{*i/j}$ mother saw?'

(...continues) ➡

We will continue to concentrate on the behavior of *də* in questions, but it is worth keeping in the back of our minds the fact that the phenomenon extends even beyond questions to these focus constructions as well.

3. Comparing Sinhala, Japanese, and Okinawan: The movement of Q

Now that we have set the stage by looking in some detail at the formation of questions in Sinhala, we will explicitly compare Sinhala questions to Japanese questions. By this route, we will answer the question of what exactly is moving between the position of *də* and the clause periphery in Sinhala questions. Note that the discussion in section 1 established a *path* of movement but did not differentiate between movement of *də* and movement of something else, e.g., the constituent to which *də* is attached (cf. footnote 7, below).

The proposal we will defend here is that *də* itself moves to the clause periphery (covertly). The argument is based on the close analogy between questions in Sinhala and questions in Japanese. We will see that (a) Japanese *-ka* corresponds to Sinhala *də*, and that (b) Japanese *-ka* appears overtly at the clause periphery while Sinhala *də* appears at the bottom of a movement path to the clause periphery. If we suppose that the base structures are the same for the two languages, then we can deduce that *-ka* must have gotten to the clause periphery in Japanese via overt movement, mirroring the covert movement of *də* for which we saw evidence in the preceding section. In fact, we even saw that in certain environments in Sinhala (as in (13), repeated below), *də* can optionally make this move overtly.

(13) a. Ranjit [**kau də** aawe kiyəla] dannəwa.
Ranjit **who Q** came-E that know
'Ranjit knows who came.'

b. Ranjit [**kauru** aawa **də** kiyəla] dannəwa.
Ranjit **who** came **Q** that know
'Ranjit knows who came.' (Kishimoto 1997:6–7)

Notice too that where Q (*də* or *-ka*) moves overtly, it moves alone, leaving the constituent they marked behind.[7]

Let us walk through this step by step. First, we want to establish that *-ka* in Japanese corresponds to *də* in Sinhala. Yes-no questions and indefinites in the two languages make it quite evident that this is the case. Some relevant examples are given below.

(continued...)

b. eyaage$_i$ amma dække Gunəpaalə$_{i/j}$ tamayi.
(s)he-GEN mother saw-E Gunapala EMPH
'It was Gunapala$_i$ that his$_{i/j}$ mother saw.' (Gair & Sumangala 1991:99)

[7] This serves to weaken the case for the "LF pied piping" view (discussed in chapter 4), which proposes an alternative explanation of the properties of *wh*-words inside islands. Specifically, under the LF pied piping analysis (see Nishigauchi 1990), the entire island moves to SpecCP. Here we have evidence that Q alone, without the island moves. If the island moves *too*, then it is something additional.

(18) a. Taroo-ga sono hon-o yomimasita **ka**? *(Japanese)*
Taroo-NOM that book-ACC read.POL **Q**
'Did Taro read that book?'

b. Chitra ee potə kieuwa **də**? *(Sinhala)*
Chitra that book read **Q**
'Did Chitra read that book?'

(19) a. **dare-ka**-ga hon-o katta. *(Japanese)*
who-Q-NOM book-ACC bought
'Someone bought books.'

b. **mokak də** wætuna. *(Sinhala)*
what Q fell
'Something (unidentified) fell.'

In both Japanese and Sinhala, the question marker appears in yes-no questions, and appears as half of an indefinite formed on a *wh*-word. Furthermore, much like Japanese *-ka*, Sinhala *də* is used in a disjunctive capacity.[8]

(20) John-**ka** Bill-(**ka**-)ga hon-o katta. *(Japanese)*
John-**Q** Bill-(**Q**-)NOM book-ACC bought
'John or Bill bought books.'

(21) mahatteaṭə tee **də** koopi **də** oonə? *(Sinhala)*
gentleman-DAT tea **Q** coffee **Q** necessary
'Do you want tea or coffee?' (Gair 1970:53)

As we have seen, there is an important divergence between Japanese and Sinhala in the structure of *wh*-questions, however. In Japanese, the *-ka* marker appears clause-peripherally both in yes-no questions and in *wh*-questions, but in Sinhala *wh*-questions the *də* marker can appear next to the *wh*-word, remaining clause-internal. Examples for comparison are repeated below.

(22) John-ga **nani**-o kaimasita-**ka**? *(Japanese)*
John-NOM **what**-ACC bought.POL-**Q**
'What did John buy?'

(23) **mokak də** wætune? *(Sinhala)*
what Q fell-**E**
'What fell?'

---

[8] According to MacDougall (1979[vol.3]:86), Fairbanks, Gair & De Silva (1968a:229), *də* is used disjunctively only in interrogatives. To express 'either...or' in declarative sentences, a different particle, *-hari* (-හරි) is used. MacDougall (1979[vol.3]:89) indicates that *-hari* also occurs after question words to give a nonspecific indefinite meaning (cf. Latin *aliquis* vs. *quīdam*, perhaps?); she gives කොහේ හරි *kohee hari* 'where *hari*' meaning 'somewhere or other' and කොහොම හරි *kohomə hari* 'how *hari*' meaning 'somehow or other'. Reynolds (1995:259) gives examples of argument *wh*-words as well: *mokak hari tiyeyi* 'what *hari* [be.left?]' meaning 'there will be something left', *ætule kavuru hari innavaa* 'within who *hari* be' meaning 'there's someone inside', and *kavuru hari dannavaada* 'who *hari* know Q' meaning 'does somebody (anybody) know?'.

In fact, as we saw in the previous chapter, the question marker *də* can appear clause-internally even for yes-no questions in Sinhala (unlike in Japanese). A relevant example is repeated below.

(24) Chitra **də** ee potə kieuwe? (*Sinhala*)
Chitra **Q** that book read-**E**
'Did *Chitra* read that book?' (Kishimoto 1997:16)

Remember that in the previous sections we saw evidence that in Sinhala the *də* marker undergoes movement to the clause peripheral position in questions. If we are correct in identifying Sinhala *də* with Japanese *-ka*, and if the structure of questions in the two languages are as similar as they appear to be, this suggests that the covert movement we detected in Sinhala is happening *overtly* in Japanese. Japanese *-ka* corresponds to Sinhala *də*, and it surfaces clause-peripherally, the destination of the proposed movement of Sinhala *də*. Also, *-ka* alone moves to the edge of the clause in Japanese; if the difference between Japanese and Sinhala lies in a difference in whether the relevant movement is overt or covert, then this constitutes evidence that in Sinhala it is *də* alone that moves covertly to the end of the clause. The rest of this thesis will be an exploration of the proposal that the clause-peripheral *-ka* in Japanese *wh*-questions moves to its surface position from a clause-internal position (a proposal which bears some similarity to those made by Tonoike 1992, Yanagida 1995, and Kim 1989, 1991).

Evidence from premodern Japanese gives this proposal additional plausibility; we can see that *-ka* behaves almost exactly like Sinhala *də*.[9] Recall from chapter 1 that in the premodern Japanese *kakari-musubi* construction, the question particle *-ka* appeared directly next to the *wh*-word (parallel to Sinhala *kau-də* 'who-Q'), and the verb takes the adnominal form (parallel to Sinhala 'E'). A simple example is repeated from chapter 1 below.[10]

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[9] Outside of interrogatives, *-ka* also had another role in premodern Japanese, which had the effect of expressing doubt. In this capacity, *-ka* was fairly free to attach (as a *musubi*-particle) to any (nominal) element. Ogawa (1976:231) indicates that this freedom existed at least in the Nara period (roughly the 8th century). By the Heian period (12th century), *-ka* was restricted to attaching to a constituent that dominated—or was itself—a *wh*-word (Ogawa 1976:237–8). This dubative use of *-ka* still seems to exist in modern Japanese as well, but of course in modern Japanese *-ka* only surfaces at the end of the clause. The connection between the dubative *-ka* and the interrogative/indefinite *-ka* is probably not a coincidence, since the phenomenon occurs in Sinhala as well. Gair & Sumangala (1991:96–7) indicate that, apart from its interrogative use, *də* in Sinhala can serve to confer 'general doubt' if it appears farther from the associated *wh*-word than it needs to be (cf. generalization (4)). Both in premodern Japanese and in Sinhala, such constructions appear to play a role in forming exclamatives as well. I do not provide any analysis in this thesis for this use of Q, however. Cf. also Navajo *-shíí*, discussed in footnote 44, which seems to form indefinite-like words from *wh*-words, as well as serve as a dubative particle.

[10] As Japanese evolved from premodern Japanese, the adnominal *musubi* form began to be possible even in the absence of a *kakari*-particle, which eventually resulted in the loss of the distinction between completive and adnominal verb forms. In modern Japanese, this distinction has completely disappeared, with the forms that were historically adnominal serving both completive and adnominal functions (see Ogawa 1976). The loss of this distinction seems to coincide with the loss of *kakari-musubi* as well. Only the *kakari*-particle *-koso*, which triggered a different verbal form in premodern Japanese than the other *kakari*-particles, survives to modern Japanese as a clause-internal particle. In present-day Japanese, there is no special *musubi* verbal form associated with *-koso*, which might in fact suggest that clause-internal *-koso* is "on its way

(...continues) ➡

(25) **tare-ka** mata hanatatibana-ni omoi-idemu. (*Premodern Japanese*)
who-Q again flower.orange-DAT remember-**M**
'Who will again remember (me) at the time of the mandarin orange flower?'
(*Shin Kokin Wakashū* [1205]:3, Ogawa 1977:222)

When the *wh*-word was found within an island in premodern Japanese, *-ka* was attached to the island; again, parallel to the Sinhala examples discussed above. In (26), *ika* 'how' is inside a relative clause, and *-ka* is attached outside.[11]

(*Premodern Japanese*)
(26) [**ika** yoo naru kokorozasi aramu hito-ni]-**ka** awamu to obosu.
how kind is love have person-DAT-**Q** wed that think-**M**
'[What kind of love]$_i$ do you think you would want to marry a person that has t_i?'
(*Taketori Monogatari* [c. 900], Ogawa 1977:216, Whitman 1997:166)

Not surprisingly, we also find the expected behavior in Okinawan (recall that Okinawan shares this *kakari-musubi* construction with premodern Japanese), identifying the Okinawan *kakari* particle *-GA* with Sinhala *də* and Japanese *-ka*. Just like the Sinhala question marker *də*, we find that the *kakari*-particle is disallowed inside islands, but can appear just outside of an island, as shown in (27) for complex NP island and in (28) for adjunct islands.

(*Okinawan*)
(27) a. Taruu-ya [**taa**-ga kak-ta-ru syumutyi]-GA yum-too-**ra**.
Taru-TOP **who**-NOM write-PAST-C book-**Q** read-PROG-**M**
'(I wonder) who Taru is reading the book written by.'

b. * Taruu-ya [**taa**-ga-GA kak-ta-ru syumutyi] yum-too-**ra**.
Taru-TOP **who**-NOM-**Q** write-PAST-C book read-PROG-**M**
('(I wonder) who Taru is reading the book written by.')
(Sugahara 1996:240-2)

(28) a. Taruu-ya [**nuu** kiki-gachinaa]-GA benkyoo soo-**ra**. (*Okinawan*)
Taru-TOP **what** listening-while-**Q** study doing-**M**
'(I wonder) what Taru is studying while listening to.'

b. * Taruu-ya [**nuu**-GA kiki-gachinaa] benkyoo soo-**ra**.
Taru-TOP **what**-**Q** listening-while study doing-**M**
('(I wonder) what Taru is studying while listening to.')
(Sugahara 1996:240-2)

(continued...)
out." This is consistent with the fact that the loss of the distinctive *musubi* marking for *-koso* was historically quite recent (Leon Serafim, p.c.).

[11] Ogawa (1977:216) gives Watanabe (1959:59), Yamada (1958:331), and Mushiake (1958:91) as the sources for example (26). I have used the translation of this example given in Whitman (1997:166), but removed certain details from the glosses.

Recalling that in matrix questions, Okinawan *-GA* surfaces clause-finally, we could say that Okinawan shows us within a *single* language the contrast that we were drawing between Japanese on one hand and Sinhala on the other.[12] Embedded questions in Okinawan tell us where the *-GA* morpheme is before moving to the clause periphery, generally adjacent to the *wh*-word (like in Sinhala), while matrix questions require the *-GA* morpheme to move to the clause periphery (like in Japanese). As we would expect (based on the parallel questions in Japanese, discussed further in section 4), *wh*-words in matrix questions may appear inside islands, such as the complex noun phrase in (29).

(29) ʔyaa-ya [[**taa**-ga ka-cha-ru] syumutyi] yu-da-GA.
you-TOP **who**-NOM write-PAST-C book read-PAST-**Q**
'Books that who wrote did you read?' (Miyara 1998:34)

Presumably, this is allowed because *-GA* can move from a position outside the island (i.e. the position where we see it overtly in embedded questions like (27a)). This idea will be extended to Japanese and discussed in more detail in the next section.

We have now set up the initial motivation for the hypotheses listed below.

(30) *Hypotheses*
a. Japanese *-ka* ↔ Sinhala *də* ↔ Okinawan *-GA*; we refer to this as 'Q'.
b. Q moves to the clause periphery from a clause-internal position.
c. The path of Q-movement is the same in all three languages.
d. Japanese *-ka* moves *overtly.*
e. Sinhala *də* moves *covertly* (in most cases—sometimes overtly).
f. Okinawan *-GA* moves *overtly* in matrix questions,
and *covertly* in embedded questions.

Let us also define a piece of terminology which we will make frequent use of in the upcoming sections. The hypothesis is that Q moves from a clause-internal position to the clause periphery. We will refer to the position from which Q moved to the clause periphery as the "launching site."

(31) The LAUNCHING SITE OF Q refers to the position Q occupies *just before* being moved to the clause periphery.

The launching site of Q is the position in which *də* appears in Sinhala, and it is the position from which the clause-peripheral *-ka* in Japanese has moved. As seen above, the launching site of Q cannot be inside an island, but may be just outside. We need to introduce the new term "launching site" because we will later need to distinguish the *launching site* from the *base position* of Q. In chapter 4, we will discuss evidence that shows that Q is (in certain cases) not *base generated* in its launching site, but rather *moves* to its launching site. Further discussion of this is postponed until then.

Let me close this section with a of comment about Subjacency and its interaction with covert movement. The analysis being proposed in this chapter relies on the inability of

[12] However, arguably we have seen this Sinhala-internally already, since *də*-movement can be overt in certain cases (cf. the discussion in section 2).

movement to take place out of islands. In particular, *covert* movement (e.g., of Sinhala *də*) must also be constrained from moving out of islands. Thus, we enter a fairly long-standing debate on this issue, provoked by Huang's (1982a, 1982b) argument to the contrary, on the side of Subjacency constraints *throughout* the entire derivation. Huang's empirical arguments for his contrary position rely on assumptions about the eventual form that the LF representation must take, but we do not adopt the same assumptions here.

4. Evidence for *-ka*-movement: Forcing *-ka* inside islands with *ittai*

It has been widely observed in the literature (e.g., by Choe 1987, Lasnik & Saito 1992, Nishigauchi 1990, Pesetsky 1987, Watanabe 1992a, 1992b, among others) that *wh*-words in Japanese are allowed to appear inside certain movement islands. Examples which show this are given below. In (32), we see that *wh*-words are allowed inside Complex Noun Phrase islands, and in (33), we see that *wh*-words are allowed inside adjuncts.

(32) a. kimi-wa [**dare**-ga kai-ta hon-o] yomi-masi-ta **ka**?
you-TOP **who**-NOM wrote book-ACC read.POL-PAST **Q**
'You read books that who wrote?' (Nishigauchi 1990:40)

b. John-wa [**nani**-o katta hito]-o sagasite iru **no**?
John-TOP **what**-ACC bought person-ACC looking-for **Q**
'John is looking for the person who bought what?' (Watanabe 1992b:3)

c. Mary-wa [John-ni **nani**-o ageta hito-ni] atta **no**?
Mary-TOP John-DAT **what**-ACC gave man-DAT met **Q**
'Mary met the man who gave what to John?' (Pesetsky 1987:110)

(33) Mary-wa [John-ga **nani**-o yomu mae-ni] dekaketa **no**?
Mary-TOP John-NOM **what**-ACC read before left **Q**
'Mary left before John read what?' (Pesetsky 1987:110)

Compare these to the similar examples we saw earlier from Sinhala, repeated below. The examples in (1) illustrate the behavior of *wh*-words inside a CNP island, and those in (6) illustrate their behavior inside adjunct islands. These cases show that *wh*-words can appear inside these islands, but only under one condition: the question marker *də* must be outside of the island. Recall that we took this as evidence for (covert) movement of *də* to the clause periphery.

(1) a. * oyaa [**kau də** liyəpu potə] kieuwe?
you **who Q** wrote book read-**E**
('You read the book that who wrote?')

b. oyaa [**kauru** liyəpu potə] **də** kieuwe?
you **who** wrote book **Q** read-**E**
'You read the book that who wrote?' (Kishimoto 1992:56)

(6) a. * [**kau də** enə koṭə] Ranjit paaḍam kəramin hiṭie?
who Q came time Ranjit study doing was-**E**
('Ranjit was studying when who came?')

b. [**kauru** enə koṭə] **də** Ranjit paaḍam kəramin hiṭie?
who came time **Q** Ranjit study doing was-**E**
'Ranjit was studying when who came?' (Kishimoto 1992:58)

In the preceding section, it was proposed that Japanese reflects overtly a movement which happens only covertly in Sinhala. Specifically, we hypothesized that the clause-final *-ka* in a Japanese question moves overtly to its surface position from a clause-internal position which corresponds to the overt location of *də* in a Sinhala question. Taking this seriously gives us an answer to the question of why *wh*-words are allowed inside adjunct and CNP islands in Japanese: When *-ka* moves from the *edge* of the island (as *də* does in Sinhala), the overt movement of *-ka* will not cross any island boundaries.[13,14] That is to say, a *wh*-question in Japanese is structurally ambiguous in principle with respect to the launching site of *-ka* for this movement; because the movement to the clause-periphery is overt, in a case like (33), *-ka* might have started either inside the adjunct clause or attached to the adjunct clause, just like *də* in (6). Since the second of these options yields a grammatical question, (33) is well-formed.

This view naturally leads us to wonder if there is any way we could *force -ka* to launch from inside the island in Japanese. If so, this would allow us to test the parallelism between Sinhala and Japanese, since we predict that if *-ka* were forced to start from inside an island, the result would be just as bad as (1a) and (6a). The sort of thing we would need is something which overtly indicates the launching site of *-ka*.

Fortunately, Japanese appears to have a word which can do just this. As we will see, the emphasis marker *ittai* '...in the world' provides information about the launching site of *-ka*.[15] The properties of *ittai* have been discussed by Pesetsky (1987), Lasnik & Saito (1992), Yanagida (1995), among others. A simple example of *ittai* in an uncomplicated question is given in (34).

(34) Mary-wa John-ni **ittai nani**-o ageta no?
Mary-TOP John-DAT **ittai what**-ACC gave Q
'What in the world did Mary give to John?' (Pesetsky 1987:111)

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[13] This proposal shares much of the intuitions behind Watanabe's (1992a, 1992b), Aoun & Li's (1993a, 1993b), and Tsai's (1994) proposals, although differing in specifics.

[14] This is the same explanation given in the previous section for the Okinawan example in (29).

[15] Sumangala (1992) suggested that Sinhala *magulak* is parallel to Japanese *ittai*, giving the example in (i).

(i) oyaa [mona **magulak** horəkankərəpu minihekvə] **də** hoyanne?
you what **magulak** stolen man-acc **Q** look.for-**E**
'What the hell are you looking for a man who stole?' (Sumangala 1992:217)

Notice, however, that *magulak* is fine inside an island (so long as *də* is not also inside the island), a property which it does not share with Japanese *ittai* (as we are about to see in the text). According to Reynolds (1995:78), *mona* 'which' needs a complement noun, suggesting that *mona magulak* is really a fairly ordinary *wh*-phrase (cf. *mona potak* 'what (kind of) book') except with a head noun that has an emphatic/impolite meaning. Under this interpretation (i) is structurally just like (ii).

(ii) oyaa [mona **potak** horəkankərəpu minihekvə] **də** hoyanne?
you what **book** stolen man-acc **Q** look.for-**E**
'What (kind of) book are you looking for a man who stole?'

Kumara Henadeerage (p.c.) told me that *magulak* in other contexts means 'a wedding'. Given all of this, I will assume that *ittai* and *magulak* are *not* syntactically comparable.

When *ittai* is by a *wh*-word, inside an island—like a CNP island (35a) or an adjunct island (35b)—the result is ungrammatical. Notice that these examples minimally contrast with (32c) and (33), respectively.

(35) a. * Mary-wa [John-ni **ittai** **nani**-o ageta hito-ni] atta **no**?
Mary-TOP John-DAT **ittai** **what**-ACC gave man-DAT met **Q**
('Mary met the man who gave what (in the world) to John?')

b. * Mary-wa [John-ga **ittai** **nani**-o yomu mae-ni] dekaketa **no**?
Mary-TOP John-NOM **ittai** **what**-ACC read before left **Q**
('Mary left before John read what (in the world)?')
(Pesetsky 1987:112)

Pesetsky (1987:126), citing Nishigauchi (1985) and Hoji (1985:393), points out that *ittai* also appears before an entire island containing a *wh*-phrase. As an example, (36) differs from (35a) only in that *ittai* is outside the island. Notice that, if *ittai* is not itself within the island, the questions are grammatical.

(36) Mary-wa **ittai** [John-ni **nani**-o ageta hito-ni] atta **no**?
Mary-TOP **ittai** John-DAT **what**-ACC gave man-DAT met **Q**
'Mary met the man who gave what (in the world) to John?' (Pesetsky 1987:126)

The data reviewed above can be described by the generalization below.

(37) *Generalization*
Ittai may not appear inside movement islands.

The pattern we see above would follow straightforwardly if *ittai* indicates the launching site of *-ka*, under the proposal advanced earlier in this chapter. In (36), since *ittai* is outside the island, *-ka* was launched from outside the island. In (35), where *ittai* is inside the island, *-ka* must have launched from inside the island, meaning that movement of *-ka* to the clause periphery had to cross the island boundary.

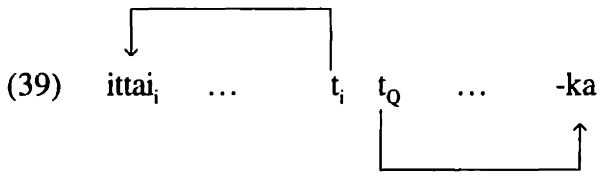
It is worth pointing out that *ittai* does not always unambiguously *mark* the launching site of *-ka*, but it does always *c-command* the launching site of *-ka*. It appears that *ittai* itself can scramble away from the launching site of *-ka*. The examples in (38a–c) show *ittai* separated from the launching site of *-ka* (which is by the *wh*-word in (38a) and (38c) and outside the island in (38b)).

(38) a. John-wa **ittai** kinoo honya-de **nani**-o kaimasita ka?
John-TOP **ittai** yesterday bookstore-LOC **what**-ACC bought.POL Q
'What in the world did John buy in the bookstore yesterday?'

b. **ittai** John-wa [**dare**-ga kaita hon-o] sagasiteimasu ka?
ittai John-TOP **who**-NOM wrote book-ACC looking.for.POL Q
'John is looking for a book that who (in the world) wrote?'
(Yanagida 1995:60)

c. John-wa **ittai** Mary-ni **nani**-o watasita no?
John-TOP **ittai** Mary-DAT **what**-ACC handed Q
'What in the world did John hand to Mary?' (Lasnik & Saito 1992:176)

The analysis of *ittai* which is taking shape is illustrated below in (39), where t_Q represents the launching site of *-ka*.

(39) 

That is, *ittai* and *-ka* begin together at the launching site of *-ka*. From this position, *ittai* can scramble away (as indicated by (38)). We will investigate this in more detail in the next section.

Hoji (1985) notes a further island-like effect with declarative complements of non-bridge verbs (in contrast to complements of bridge verbs). According to Hoji, *ittai* is much better inside the complement of a bridge verb like *omotta* 'thought' or *itta* 'said' than it is inside the complement of a non-bridge verb like *sasayaita* 'whispered' or *sakenda* 'shouted'. His examples are given in (40).

(40) a. ?? kimi-wa [Mary-ga **ittai** nani-o tabeta to] **sasayaita** no?
you-TOP Mary-NOM **ittai** what-ACC ate that **whispered** Q
('What in the world did you whisper that Mary ate?')

b. kimi-wa [Mary-ga **ittai** nani-o tabeta to] **omotta** no?
you-TOP Mary-NOM **ittai** what-ACC ate that **thought** Q
'What in the world did you think Mary ate?' (Hoji 1985:394)

(40) suggests that *-ka* has difficulty moving from within the complement of a non-bridge verb to its clause-peripheral position. There is a complication with the Japanese data which we return to momentarily, but first let me observe that the Japanese facts in (40) correlate nicely with a similar paradigm in Sinhala; Kishimoto (1992, 1997) gives analogous facts which show that *də* can appear inside the complement of a bridge verbs like *dannəwa* 'know' and *kiiwa* 'say', as shown in (41),[16] but not in the complement of non-bridge verbs like *kendiruwa* 'whisper', as in (42).[17]

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[16] Rapti Dietrich (p.c.) expressed some doubt as to the *wh*-form *mokaa-ṭə* 'what-DAT' in (41). She seemed to prefer *mokak* instead, which might simply be a (dialectal?) difference in the argument structure of the verb *gæhuwa* 'hit'.

[17] Kishimoto (1992:59) gave an example which is nearly identical to (42b) and rated it "*". However, I suspect that overstates the ill-formedness of the question. Shigeru Miyagawa (p.c.) tells me that the distinction in Japanese (40) is a very delicate one, which leads me to assume that Kishimoto's later (1997) judgment (reported above) is closer to correct. In the interest of parallelism, example (42a) has been changed slightly from Kishimoto's actual example, which involved *monə potə* 'what book' instead of *monəwa* 'what'.

(41) a. Ranjit [Chitra **mokaa**-ṭə gæhuwa kiyəla] **də** kiiwe?
Ranjit Chitra **what**-DAT hit that **Q** said-**E**
'Ranjit said that Chitra hit what?'

b. Ranjit [Chitra **mokaa**-ṭə-**də** gæhuwa kiyəla] kiiwe?
Ranjit Chitra **what**-DAT-**Q** hit that said-**E**
'Ranjit said that Chitra hit what?' (Kishimoto 1992:59)

(42) a. Chitra [Ranjit **monəwa** gatta kiyəla] **də** kendiruwe?
Chitra Ranjit **what** bought that **Q** whispered-**E**
'Chitra whispered that Ranjit bought what book?' (~Kishimoto 1997:40)

b. ?? Chitra [Ranjit **monəwa** **də** gatta kiyəla] kendiruwe?
Chitra Ranjit **what** **Q** bought that whispered-**E**
'Chitra whispered that Ranjit bought what book?' (Kishimoto 1997:33)

Also in Okinawan, we find that in the complement of verbs like *ʔum-* 'think', the *kakari*-particle can be either attached to the *wh*-word or to the complement clause.[18]

(43) a. Taruu-ya [**taa**-ga-GA ringo kam-ta-N-Ndi] ʔumu-too-**ra**.
Taru-TOP **who**-NOM-**Q** apple eat-PAST-DEC-COMP think-PROG-**M**
'(I wonder) who Taru is thinking that ate the apple.'

b. Taruu-ya [**taa**-ga ringo kam-ta-N-Ndi]-GA ʔumu-too-**ra**.
Taru-TOP **who**-NOM apple eat-PAST-DEC-COMP-**Q** think-PROG-**M**
'(I wonder) who Taru is thinking that ate the apple.' (Sugahara 1996:240)

The complication with the Japanese data alluded to above is that *wh*-words inside the complement of non-bridge verbs are quite ill-formed even without *ittai*. Shigeru Miyagawa (p.c.) suggests that *sakenda* 'shout' is a better specimen of non-bridge verb, and observes that there is a distinction between (44a) and (44b) even in the absence of *ittai* (compare with (40) above).

(44) a. ??? Taroo-wa [Mary-ga **nani**-o nusunda to] **sakenda** no?
Taroo-TOP Mary-NOM **what**-ACC stole that **shouted** Q
('What did Taro shout that Mary stole?')

b. Taroo-wa [Mary-ga **nani**-o nusunda to] **omotta** no?
Taroo-TOP Mary-NOM **what**-ACC stole that **thought** Q
'What did Taro think that Mary stole?' (Shigeru Miyagawa, p.c.)

When we add *ittai* inside the complement clause, the situation worsens ever-so-slightly for the non-bridge verb.

(45) a. * Taroo-wa [Mary-ga **ittai** **nani**-o nusunda to] **sakenda** no?
Taroo-TOP Mary-NOM **ittai** **what**-ACC stole that **shouted** Q
('What (in the world) did Taro shout that Mary stole?')

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[18] It would be nice to show that a clause-internal *-GA* is impossible in the complement of non-bridge verbs like *whisper* in Okinawan as well, but I currently lack the data.

b. Taroo-wa [Mary-ga **ittai** **nani**-o nusunda to] **omotta** no?
Taroo-TOP Mary-NOM **ittai** **what**-ACC stole that **thought** Q
'What (in the world) did Taro think that Mary stole?'
(Shigeru Miyagawa, p.c.)

But when *ittai* is outside the complement clause, the question is not *quite* as horrible as in (45).

(46) a. ??? Taroo-wa **ittai** [Mary-ga **nani**-o nusunda to] **sakenda** no?
Taroo-TOP **ittai** Mary-NOM **what**-ACC stole that **shouted** Q
('What (in the world) did Taro shout that Mary stole?')

b. Taroo-wa **ittai** [Mary-ga **nani**-o nusunda to] **omotta** no?
Taroo-TOP **ittai** Mary-NOM **what**-ACC stole that **thought** Q
'What (in the world) did Taro think that Mary stole?'
(Shigeru Miyagawa, p.c.)

Clearly, this is not the kind of contrast we would want to found an analysis on, but what little contrast there is goes in the same direction as the other contrasts reviewed in this section; they all point to an analysis in which *ittai* marks an upper bound on the launching site of *-ka*. Where *ittai* is inside the complement of a non-bridge verb, this means that *-ka* must have launched from inside as well, forcing *-ka* to move out of this complement in order to reach the clause periphery.[19]

Considered together, the evidence reviewed above suggests quite strongly that the location of *ittai* reliably indicates an upper bound on the launching site of *-ka*. In the next section, we will look more closely at the structural properties of *ittai*.

Overall, the point of this section was to show that the correlation between Sinhala *də* and Japanese *-ka* is quite good, by using *ittai* as a means of localizing the launching site of *-ka*. In the process, we were able to come up with a fairly precise idea of the underlying structure of questions with *ittai* as well. The ability of *ittai* to localize the launching site of *-ka* helps justify the extension of our conclusions about Sinhala to Japanese. We already saw evidence for movement of *də* in Sinhala questions, based on island effects, and we have seen here that with the help of *ittai* we can induce the same island effects in Japanese questions.

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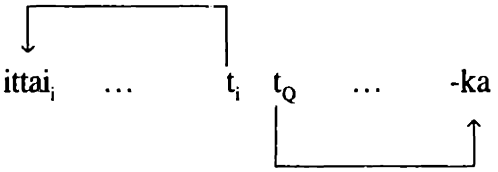
[19] We have just seen that *wh*-words in the complements of non-bridge verbs are not well-formed in Japanese. This differs from the examples from Sinhala that we saw previously; the Sinhala (42a) was good, unlike the Japanese (44a). So far it remains unexplained why *wh*-words are allowed in the complement of non-bridge verbs in Sinhala but not in Japanese. Let me point out one clue from Sinhala, however; notice that in the good case, *də* follows *kiyəla*, whereas in cases of optional *də*-movement to the periphery (with *wh*-words like *kiidenek* 'how many (animate)' for example), *də* precedes *kiyəla* when it is at the periphery. This suggests that there is a position outside CP where *də* can attach in Sinhala, and which may be unavailable in Japanese. We will come back to this issue when we discuss *wh*-island effects in chapter 4.

5. Some structural properties of *ittai*

> I remember the first time I ever saw a shooting star I said, "What the hell is that?" But nowadays when I see one I just say, "What is that?" I leave off the "hell" part. Maybe when I'm old I'll just say "Whazzit?"
> --Jack Handey, *Fuzzy Memories*.

In the previous section, we made use of *ittai* as a tool for localizing the launching site of *-ka*. In this section, we will explore the properties of *ittai* in somewhat more detail. This investigation will help shed some light on the relation between *ittai* and *-ka*, and generally bolster the argument that *ittai* is a reliable diagnostic for the launching site of *-ka*.

Recall that the picture of *ittai* we left off with is (39), repeated below, where t_Q is the launching site of *-ka*.

(39) 

Let me lead off the discussion with an observation that shows the intimate connection between *ittai* and *-ka*. As mentioned in chapter 1, Japanese allows a question to be signaled solely by intonation, without a *-ka* present. However, in such questions, we find that *ittai* becomes quite awkward (47).[20]

(47) ?? John-ga **ittai** nani-o tabeta?
John-NOM **ittai** what-ACC ate
('What in the world did John eat?')
(Shigeru Miyagawa, Kazuko Yatsushiro, Takako Aikawa, p.c.)

This means that the presence of *ittai* implies the presence of *-ka*; that is, *ittai* appears to be in some way dependent on *-ka*. In terms of the analysis pictured in (39), the adjacency between *ittai* and the launching site of *-ka* is crucial for the licensing of *ittai*.

We have seen that *ittai* can scramble away from the launching site of *-ka*—this was shown by the examples from the previous section in (38)—but there are certain restrictions on the path of *ittai* scrambling. In fact, the properties of *ittai* parallel closely the properties of numeral quantifiers.[21,22] Miyagawa (1989) discusses the properties of numeral

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[20] The question also does not seem to be completely out, but I speculate (based on a suggestion by Shigeru Miyagawa (p.c.)) that this might be because it can get an interpretation as an echo question, and that *ittai* can be echoed, in response to the question *John-ga ittai [mumbled] tabeta-no?*. In this connection, it is worth pointing out that *ittai* is allowed in yes-no questions, for example (i). Shigeru Miyagawa (p.c.) warns me, however, that *ittai* may have a somewhat different meaning in questions like (i). I have not investigated these issues systematically.

(i) Taroo-wa ittai ringo-o katta no?
Taroo-TOP ittai apple-ACC bought Q
'Did Taroo buy *apples*?' (Yanagida 1998:12)

[21] Thanks to Shigeru Miyagawa (p.c.) for noticing this and bringing it to my attention.

quantifiers and proposes an analysis in which the numeral quantifier and its associated NP originate adjacent to one another, although either the antecedent or the object can then be scrambled. We will briefly review those facts and compare them to the behavior of *ittai*.

Cases involving an object and a numeral quantifier are given in (48).[23] The numeral quantifier and the antecedent are base-generated adjacent to one another in the object position, after which either the antecedent (48b) or the numeral quantifier (48c) can scramble.

(48) a. Hanako-ga **hon**-o **2-satu** katta.
Hanako-NOM **book**-ACC **2-CL** bought
'Hanako bought 2 books.' (Miyagawa 1989:19)

b. **hon**-o$_i$ Hanako-ga t$_i$ **2-satu** katta.
book-ACC Hanako-NOM **2-CL** bought
'Hanako bought 2 books.' (~Miyagawa 1989:21)

c. **2-satu**$_i$ Hanako-ga **hon**-o t$_i$ katta.
2-CL Hanako-NOM **book**-ACC bought
'Hanako bought 2 books.' (~Miyagawa 1989:50)

In (49) are parallel cases where the subject has an associated numeral quantifier. Again, the numeral quantifier and the antecedent can either remain adjacent in argument position (49a), the antecedent can scramble (49b), or the numeral quantifier can scramble (49c).

(49) a. **gakusei**-ga **4-nin** hon-o katta.
student-NOM **4-CL** book-ACC bought
'Four students bought books.' (Miyagawa 1989:21)

b. **gakusei**-ga$_i$ kinoo t$_i$ **4-nin** hon-o katta.
student-NOM yesterday **4-CL** book-ACC bought
'Four students bought books yesterday.' (~Miyagawa 1989:28)

c. **4-nin**$_i$ kinoo **gakusei**-ga t$_i$ hon-o katta.
4-CL yesterday **student**-NOM book-ACC bought
'Four students bought books yesterday.' (~Miyagawa 1989:51)

One thing which is not allowed is a configuration where the antecedent and the numeral quantifier could never have been adjacent. An example like this is given in (50).

(50) ?* **gakusei**-ga hon-o **4-nin** katta.
student-NOM book-ACC **4-CL** bought
('Four students bought books.') (Miyagawa 1989:21)

(continued...)

[22] Shigeru Miyagawa (p.c.) tells me that etymologically *ittai* is formed from 'one' (*it-*) and 'body' (*-tai*) (as indicated by the Chinese characters it is written with). Although its present meaning does not seem to be built compositionally from these parts, there might be historical clues here as to why *ittai* acts in certain respects like a numeral quantifier.

[23] The observation that an object can be scrambled away from its associated numeral quantifier was originally made by Kuroda (1980).

Here, the numeral quantifier is separated from the (intended) antecedent by the object. The only ways the subject and numeral quantifier could have been adjacent are (a) if the numeral quantifier scrambled *downward*, or (b) if the object scrambled over the subject and then the subject scrambled over the just-scrambled object, both of which we assume are not possible.[24] Since there is no legitimate way to arrive at (50) starting from a configuration where the subject and the numeral quantifier are adjacent, the sentence is ill-formed.

The full paradigm just reviewed is given in schematic form below.

(51)	a.			subj	obj	NQ	verb			=(48a)
	b.		obj_i	subj	t_i	NQ	verb			=(48b)
	c.		NQ_i	subj	obj	t_i	verb			=(48c)
	d.			(adv)	subj	NQ	obj		verb	=(49a)
	e.		$subj_i$	adv	t_i	NQ	obj		verb	=(49b)
	f.		NQ_i	adv	subj	t_i	obj		verb	=(49c)
	g.	*		(adv)	subj	t_i	obj	NQ_i	verb	=(50)

We reviewed the behavior of numeral quantifiers because it appears that the relation between *ittai* and the launching site of *-ka* parallels the relation between numeral quantifiers and their antecedent. In the examples below, the launching site of *-ka* is adjacent to the *wh*-word; we use the visible position of the *wh*-word as an indication of where the launching site of *-ka* is. In (52), we see that the relation between *ittai* and the *wh*-object (which marks the launching site of *-ka* in these examples) has the same distributional options as the relation between a numeral-quantifier and an antecedent object; (52) is parallel to (48).

(52) a. Taroo-ga **ittai** **nani**-o yonda no?
Taroo-NOM **ittai** **what**-ACC read Q
'What in the world did Taro read?'

b. **ittai**$_i$ Taroo-ga t_i **nani**-o yonda no?
ittai Taroo-NOM **what**-ACC read Q
'What in the world did Taro read?'

c. (*) **nani**-o_i Taroo-ga **ittai** t_i yonda no?
what-ACC Taroo-NOM **ittai** read Q
'What in the world did Taro read?'

(Shigeru Miyagawa, Takako Aikawa, Junko Shimoyama, Hidekazu Tanaka, p.c.)

A note about the judgment of (52c): Some people I have asked seem to dislike stranding *ittai*, and rate examples like (52c) (along with (53c), (54), and (56b), below) as ungrammatical. However, this does not necessarily indicate that numeral quantifiers act

[24] Downward movement is disallowed by the fact that no mechanism exists to implement it within the minimalist approach to syntax we adopt here (Chomsky 1995). The impossibility of the "double scrambling" analysis could either be because the Japanese subject just *cannot* scramble, as argued by Saito (1985), or for some other (perhaps parsing-related) reason.

different from *ittai*; for these people, when a *wh*-word is scrambled, Q may have to scramble along with it. On the assumption *ittai* originates by the launching site of Q (though may scramble away from it, as in (52b)), the paradigms fall out as predicted. In fact, in chapter 3 we need to assume that in multiple questions Q cannot be stranded in Japanese, so these judgments might in fact be *more* consistent with the story we are developing than the judgments of those who accept stranded *ittai*. Because the judgments varied across the speakers I consulted, future work will have to determine which pattern is the most representative.

We also find that the relation between *ittai* and the launching site of *-ka* next to a *wh*-subject parallels the corresponding case with a numeral quantifier; compare (53) with (49).

(53) a. **ittai** **dare**-ga hon-o katta no?
ittai **who**-NOM book-ACC bought Q
'Who in the world bought books?'

b. **ittai**$_i$ kinoo t_i **dare**-ga hon-o katta no?
ittai yesterday **who**-NOM book-ACC bought Q
'Who in the world bought books yesterday?'

c. (*) **dare**-ga$_i$ kinoo **ittai** t_i hon-o katta no?
who-NOM yesterday **ittai** book-ACC bought Q
'Who in the world bought books yesterday?'
(Shigeru Miyagawa, Takako Aikawa, Junko Shimoyama, Hidekazu Tanaka, p.c.)

Lastly, in the same configuration where a numeral quantifier cannot be associated with a subject antecedent, neither can *ittai* and be associated with a launching site of *-ka* by a *wh*-subject. Compare (50) with (54).

(54) * **dare**-ga hon-o **ittai** yonda no?
who-NOM book-ACC **ittai** read Q
('Who in the world read a book?')
(Shigeru Miyagawa, Takako Aikawa, Junko Shimoyama, Hidekazu Tanaka, p.c.)

The pattern of data just reviewed is summarized schematically below.

(55)	a.		subj	ittai	*wh*-obj	verb			=(52a)
	c.	ittai$_i$	subj	t_i	*wh*-obj	verb			=(52b)
	b.	(*) *wh*-obj$_i$	subj	ittai	t_i	verb			=(52c)
	d.		(adv)	ittai	*wh*-subj	obj		verb	=(53a)
	f.	ittai$_i$	adv	t_i	*wh*-subj	obj		verb	=(53b)
	e.	(*) *wh*-subj$_i$	adv	ittai	t_i	obj		verb	=(53c)
	g.	*	(adv)	t_i	*wh*-subj	obj	ittai$_i$	verb	=(54)

Matching the analysis given to numeral quantifiers, we can analyze the relation between *ittai* and the launching site of *-ka* as being one of initial adjacency.

The parallelism between numeral quantifiers and *ittai* is already striking, but let us review one more example of this type. Miyagawa (1989) observes that in cases where a subject is promoted from inside the VP, such as in a passive, a numeral quantifier *can* be left behind, leading to sentences in which a subject is separated from its numeral quantifier by another argument (56a).

(56) a. yuube, **kuruma**-ga$_i$ doroboo-ni t_i **2-dai** nusum-**are**-ta.
last.night **car**-NOM thief-by **2-CL** steal-**PASS**-PAST
'Last night, two cars were stolen by a thief.' (Miyagawa 1989:38)

On the surface, these look parallel to cases like (50), where an object between a numeral quantifier and a subject antecedent is ill-formed. Underlyingly, however, we *do* have reason to think that the subject of a passive starts out in object position, meaning that the promoted subject did indeed originate adjacent to the numeral quantifier. Supporting the numeral/*ittai* parallel, we find that exactly the same option is also available to *ittai* (56b).

(56) b. (*) yuube, **nani**-ga$_i$ doroboo-ni **ittai** t_i nusum-**are**-ta no?
last.night **what**-NOM thief-by **ittai** steal-**PASS**-PAST Q
'What in the world was stolen by a thief last night?'
(Shigeru Miyagawa, Takako Aikawa, Junko Shimoyama, Hidekazu Tanaka, p.c.)

The parallels that we have seen between *ittai* and numeral quantifiers have been quite strong, and point quite clearly to the analysis proposed in (39) in which *ittai* and the launching site of *-ka* are originally adjacent.

The closeness of the parallels exhibited above make even more surprising the apparent *lack* of parallelism we find in the questions in (57). We see below that, although the association between the original launching site of *-ka* and *ittai* in (57a) crosses finite clause boundaries without difficulty, the corresponding example in which a numeral quantifier is scrambled out of a finite clause in (57b) is quite marginal.[25]

(57) a. **ittai**$_i$ Taroo-ga [Hanako-ga t_i **nani**-o katta **to**] itta **no**?
ittai Taroo-NOM Hanako-NOM **what**-ACC bought **that** said **Q**
'What in the world did Taro say that Hanako bought?'
(Shigeru Miyagawa, p.c.)

b. ?? **ni-satu**$_i$ Taroo-ga [Hanako-ga t_i **hon**-o katta **to**] itta **no**?
2-CL Taroo-NOM Hanako-NOM **book**-ACC bought **that** said **Q**
('Did Taro say that Hanako bought two books?')
(Shigeru Miyagawa, p.c., also ~Miyagawa 1989:65)

There is a way we can maintain the parallel between *ittai* and numeral quantifiers even given the apparent disparity in their behavior shown above. (57b) tells us quite unambiguously that scrambling numeral quantifiers over a finite clause boundary is marginal. This, in turn, tells us that (57a) must not actually involve scrambling of *ittai*

[25] (57) is another example for which judgments seemed to be quite volatile. I will account for the judgments reported in the text, leaving exploration of the variation for later.

over a finite clause boundary, despite the appearance to the contrary. We have seen evidence that *ittai* and the launching site of *-ka* are initially adjacent, and according to (57b), although *ittai* can be scrambled away from this adjacent position, it should not be able to cross a finite clause boundary. The only way to derive (57a) without allowing *ittai* to scramble over a finite clause boundary is to suppose that it is scrambling from an *intermediate position*. Supposing that *-ka* moves (in a successive-cyclic fashion) from clause to clause, *ittai* in (57a) can scramble away from the intermediate landing site for *-ka* into the matrix clause without crossing a clause boundary. The example below gives further evidence that *ittai* can scramble away from an intermediate stopping point for *-ka*; in (58), *ittai* has scrambled to a position in the embedded declarative clause yet still separated from the original launching site of *-ka* (by the *wh*-word *nani* 'what') by a clause boundary.

(58) John-ga [(kinoo) **ittai** Hanako-ga [Taroo-ga **nani**-o katta to] itta to]
John-NOM yesterday **ittai** Hanako-NOM Taroo-NOM **what**-ACC bought that said that
omotteiru **no**?
thinks **Q**
'What in the world does John think that Hanako said yesterday that Taro bought?'
(Shigeru Miyagawa, Hidekazu Tanaka, Junko Shimoyama, p.c.)

We will return to give further evidence for this successive-cyclic movement of *-ka* in chapter 4, where it will be proposed that *ittai* can be base-generated as a sister to any intermediate position *-ka* occupies above its launching site.[26]

6. More evidence for *-ka*-movement: Intervention effects of *-ka* and *-mo*

Continuing now our discussion from section 4, we can find another argument for the overt movement of *-ka* in Japanese from "intervention effects." We have seen that *-ka* can appear in several different guises, for example, as part of an indefinite like *dare-ka* 'someone', as an argument disjoiner ('or'). Miyagawa (1997, class handout) has pointed out an interesting generalization with respect to questions marked with *-ka*: an element containing *-ka* cannot intervene (hierarchically) between a *wh*-word and its scope position. Hoji (1985) observed the paradigm involving disjunctive *-ka* in (59).[27]

(59) a. ?* [John-**ka** Bill]-ga **nani**-o nomimasita **ka**?
John-or Bill-NOM **what**-ACC drank **Q**
('What did John or Bill drink?')

b. **nani**-o_i [John-**ka** Bill]-ga t_i nomimasita **ka**?
what-ACC John-or Bill-NOM drank **Q**
'What did John or Bill drink?' (Hoji 1985:268)

[26] I must leave unexplored here several possible crosslinguistic connections here. One obvious potential parallel is "*wh*-agreement" found at least in Irish (cf. McCloskey (1979)) and Chamorro (cf. Chung (1994)).
[27] For one of the native speakers I consulted, scrambling the *wh*-word (e.g. in (59b)) systematically fails to improve the question. This could be explained if, for her and speakers who agree with her judgments, either (a) scrambling must be reconstructed, or (b) scrambling cannot take *-ka* along. Surprisingly, scrambling a *wh*-word over *-mo*, however (see (78) and (79) later in the chapter) does seem to improve a sentence for this speaker. I have no explanation for this difference.

c. **dare**-ga [sake-**ka** biiru(ka)]-o nomimasita **ka**?
who-NOM sake-or beer(or)-ACC drank **Q**
'Who drank either sake or beer?' (Hoji 1985:264)

We see that disjunctive *-ka* is ill-formed if it precedes the *wh*-word (59a), although scrambling saves the sentences (59b), as does a base-order in which the *wh*-word comes first (59c). In (60) we see the same paradigm holds for the indefinite *dareka* 'someone'. Tanaka (1997a) observes that the Negative Polarity Item *-sika* 'only$_{NPI}$' (which arguably contains the morpheme *-ka*) also behaves the same way, as seen in (61).[28]

(60) a. ?? dare**ka**-ga **nani**-o nomimasita **ka**?
someone-NOM **what**-ACC drank **Q**
('What did someone drink?')

b. **nani**-o$_i$ dare**ka**-ga t$_i$ nomimasita **ka**?
what-ACC someone-NOM drank **Q**
'What did someone drink?'

c. **dare**-ga nani**ka**-o nomimasita **ka**?
who-NOM something-ACC drank **Q**
'Who drank something?' (Hoji 1985:268–9)

(61) a. ?* Taroo-si**ka** **nani**-o yoma-nai **no**?
Taroo-only$_{NPI}$ **what**-ACC read-NEG **Q**
('What did only Taro read?') (Tanaka 1997a:159)

b. **nani**-o$_i$ Taroo-si**ka** t$_i$ yoma-nai **no**?
what-ACC Taroo-only$_{NPI}$ read-NEG **Q**
'What did only Taro read?' (Tanaka 1997a:162)

c. **dare**-ga LGB-si**ka** yoma-nai **no**?
who-NOM LGB-only$_{NPI}$ read-NEG **Q**
'Who reads only LGB?' (Tanaka 1997a:160)

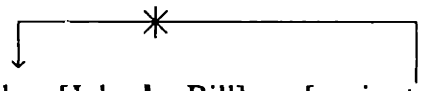
Arguably, *kadooka* 'whether' is also in the class of things which block movement of *-ka* (as suggested by Miyagawa 1997, class handout). Where the *wh*-word is below *kadooka*, as in (62), the question is ill-formed.

(62) ?? John-wa [Hanako-ga **nani**-o katta **ka**dooka] siritagatteiru **no**?
John-TOP Hanako-NOM **what**-ACC bought whether want-to-know **Q**
('What does John want to know whether Hanako bought?')
(~Shigeru Miyagawa, handout 5/14/97)

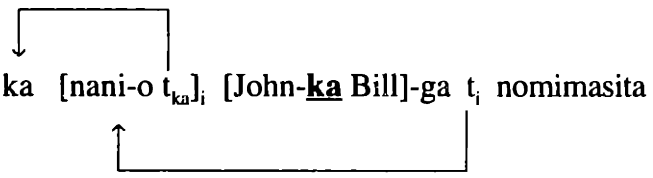
This generalization considerably strengthens the case for overt *-ka*-movement under a view of movement that requires movement of the closest eligible element to the target

[28] The historical evidence for the claim that *-sika* 'only$_{NPI}$' contains *-ka* as a subpart is somewhat unclear, according to Miyagawa (1998), citing Konoshi (1983).

position.[29] Assuming that this movement of *-ka* to an interrogative complementizer can only move the nearest eligible instance of *-ka*, we can understand the "intervention effects" illustrated above as a case where the *-ka* which *needs* to move to C for proper interpretation is not the *closest -ka* to C. That is, what is wrong with the (a) examples above is that *-ka* is required to move to the clause periphery over another (closer) instance of *-ka*. This is resolved in the (b) examples because the landing site for the scrambled *wh*-word is closer to the clause periphery than the otherwise problematic occurrence of *-ka*. Assuming that *-ka* movement can take place from this scrambled position, the facts are explained in a natural way. This is illustrated in (63) below, where order represents hierarchy (rather than surface order).



(63) a. ka [John-**ka** Bill]-ga [nani-o t_{ka}] nomimasita



b. ka [nani-o t_{ka}]$_i$ [John-**ka** Bill]-ga t_i nomimasita

Kim (1991:246) observes that the intervention effect holds even when the *wh*-word is inside an embedded clause and the intervenor is in the matrix clause. The example in (64) below illustrates this.[30]

(64) a. ?? [John-**ka** Bill-ga] [Mary-ga **nani**-o katta to] itta **no**?
John-or Bill-NOM Mary-NOM **what**-ACC bought that said **Q**
('What did John or Bill say that Mary bought?') (Shigeru Miyagawa, p.c.)

It is also worth pointing out that the notion of "closest" which is relevant for the purposes of *-ka*-intervention is a structural one (as opposed to being simply a linear intervention constraint). We can see this by noticing that (59a) can be improved by embedding *John-ka Bill* 'John or Bill' into a larger constituent, as in (65).

(65) [[John-**ka** Bill-ga] atta hito]-ga **nani**-o motte kita **no**?
John-or Bill-NOM met person-NOM **what**-ACC brought **Q**
'What did the man John or Bill met bring?' (Shigeru Miyagawa, p.c.)

We can also see this from the examples below; when disjunctive *-ka* is embedded in a postpositional *-de*-phrase (66a) movement of the question marker *-ka* is not impeded, unlike when disjunctive *-ka* is in an argument phrase (66b).[31]

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[29] The assumption that movement is as short as possible has been a common theme throughout recent syntactic research within Government-Binding and minimalist syntax (e.g., Rizzi 1990, Chomsky 1995). In the minimalist program, movement is implemented by *attraction* of the closest eligible element.

[30] However, Shigeru Miyagawa (p.c.) indicates that the intervention effect is somewhat weaker when it involves long distance movement.

(66) a. John-ga [ronbun-**ka** kougi]-**de** **dare**-o hihansita **no**?
John-NOM article-or lecture-**in** **who**-ACC criticized **Q**
'Who did John criticize either in an article or a lecture?'

b. ?? John-ga [MIT-**ka** Harvard]-**ni** **nani**-o ageta **no**?
John-NOM MIT-or Harvard-DAT **what**-ACC gave **Q**
('What did John give to either MIT or Harvard?') (Shigeru Miyagawa, p.c.)

The analysis being proposed makes a startling prediction, which appears to be borne out.[32] The idea is illustrated schematically in (67).

(67) a. ?* ... ... Intervenor ... *wh* t_{ka} ... -ka ?
b. ... $[_{island}$ ... Intervenor ... *wh* ...] t_{ka} ... -ka ?
c. ... $[_{island}$ ... wh_i ... Intervenor ... t_i ...] t_{ka} ... -ka ?

In (67), the (a) examples are ill-formed for the reasons discussed above with respect to (59a) and (60a); to reach the clause periphery, *-ka* has to move over another instance of *-ka*. However, recall from section 4 that when a *wh*-word is inside an island, the launching site for *-ka* is at the edge of the island. This predicts that embedding (67a) in an island as in (67b–c) should improve the sentences, since *-ka*, launched from outside the island, never crosses the "intervening" *-ka* which is inside the island.

The data below turns out just as predicted;[33] in (68) and (69), when the (a) examples (which are ill-formed due to the intervention effect) are embedded inside adjunct islands, as in the (b) examples, the grammaticality improves.[34] The (c) examples show that scrambling the *wh*-word over the intervening *-ka* internal to the adjunct does not change the acceptability. In (68d), the intervention effect returns if the intervenor is outside the island.

(68) a. ?* [John-**ka** Bill]-ga **nani**-o katta **no**?
John-or Bill-NOM **what**-ACC bought **Q**
('What did John or Bill buy?')

b. Mary-wa [[John-**ka** Bill]-ga **nani**-o katta ato de] dekaketa **no**?
Mary-TOP John-or Bill-NOM **what**-ACC bought after left **Q**
'Mary left after John or Bill bought what?'

(continued...)

[31] The intervention effect also seems to be weaker between two internal arguments (Shigeru Miyagawa, p.c.).

[32] Thanks to Danny Fox (p.c.) for pointing this out to me.

[33] I have found some judgment variability on these examples for which I have no consistent explanation. The majority of the people I consulted did find that configuration (67b) improved over (67a), but there was more than one person who did not get such an improvement. The account I give is based on the former judgment; I must leave explanation of the variation for future research.

[34] For some reason *-sika* doesn't seem to improve in this paradigm, for reasons which are not clear to me at the moment. It turns out that the behavior of *-sika* is unusual in other respects as well; for example, *-sika* seems to block the connection between a floated numeral quantifier and its associate, unlike other intervenors; see Miyagawa (1998). I suspect that this has something to do with the fact that NP-*sika* is a negative polarity item as well as being an intervenor for *-ka*-movement, but I have not investigated this thoroughly.

c. Mary-wa [**nani**-o$_i$ [John-**ka** Bill]-ga t_i katta ato de] dekaketa **no**?
Mary-TOP **what**-ACC John-or Bill-NOM bought after left **Q**
'Mary left after John or Bill bought what?'

d. ?* [John-**ka** Bill]-wa [Mary-ga **nani**-o katta ato de] dekaketa **no**?
John-or Bill-TOP Mary-NOM **what**-ACC bought after left **Q**
'John or Bill left after Mary bought what?'
(Shigeru Miyagawa, Kazuko Yatsushiro, Junko Shimoyama, p.c.)

(69) a. ?? dare**ka**-ga **nani**-o katta **no**?
someone-NOM **what**-ACC bought **Q**
('What did someone buy?')

b. Mary-wa [dare**ka**-ga **nani**-o katta ato de] dekaketa **no**?
Mary-TOP someone-NOM **what**-ACC bought after left **Q**
'Mary left before someone bought what?'

c. Mary-wa [**nani**-o$_i$ dare**ka**-ga t_i katta ato de] dekaketa **no**?
Mary-TOP **what**-ACC someone-NOM bought after left **Q**
'Mary left before someone bought what?'
(Shigeru Miyagawa, Kazuko Yatsushiro, p.c.)

Recall that for (59) and (60), the relative ordering was crucial for acceptability; this supports the conclusion that what made the ordering important in (59) and (60) was the movement of *-ka* from next to the *wh*-word, a movement which takes place from outside the island in (68) and (69).

While it may seem unintuitive that embedding an ill-formed sentence inside an island should improve it, this actually follows from the proposed analysis and provides further support for the contention that what made the examples in (59–60) bad is an intervening instance of *-ka*.

In section 4, we made use of *ittai* to isolate the launching site of *-ka* by using it to induce island effects. It turns out that *ittai* can induce intervention effects as well, as the paradigm below demonstrates. In (70a–b), repeated from (59), we see that scrambling *nani* 'what' over the intervening element obviates the intervention effect. This means that *-ka* can launch from its scrambled position, thereby avoiding the need to cross the disjunctive *-ka* on its way to the clause periphery. However, in (70c), when *ittai* is introduced in object position, the question becomes bad, while if *ittai* scrambles with the *wh*-word, the result is fine (recall from (52c), repeated below (70), that it is possible, for some speakers at least, to scramble a *wh*-word, leaving *ittai* behind when intervenors are not at issue).

(70) a. ?* [John-**ka** Bill]-ga [**nani**-o t_{ka}] nomimasita **ka**? (=59a)
John-or Bill-NOM **what**-ACC drank **Q**
('What did John or Bill drink?')

b. [**nani**-o$_i$ t_{ka}] [John-**ka** Bill]-ga t_i nomimasita **ka**? (=59b)
what-ACC John-or Bill-NOM drank **Q**
'What did John or Bill drink?' (Hoji 1985:268)

c. ?* **nani**-o$_i$ [John-**ka** Bill]-ga [**ittai** t_i t_{ka}] nomimasita **ka**?
what-ACC John-or Bill-NOM **ittai** drank **Q**
('What in the world did John or Bill drink?')

d. [**ittai** **nani**-o t_{ka}]$_i$ [John-**ka** Bill-ga t_i nomimasita **ka**?
ittai **what**-ACC John-or Bill-NOM drank **Q**
'What in the world did John or Bill drink?' (Shigeru Miyagawa, p.c.)

(52) c. (*) **nani**-o$_i$ Taroo-ga **ittai** t_i yonda no?
what-ACC Taroo-NOM **ittai** read Q
'What in the world did Taro read?'
(Shigeru Miyagawa, Takako Aikawa, Junko Shimoyama, Hidekazu Tanaka, p.c.)

The paradigm above suggests that (70c–d) are exactly parallel to (70a–b); by using *ittai*, we can see whether the whole *-ka*-phrase scrambled as in (70b, d) (allowing *-ka* to launch from the scrambled position) or whether only the *wh*-phrase alone scrambled (70c) in which case the configuration with respect to *-ka* and the intervening disjunction is the same as in (70a).

This also works with the other *-ka*-intervenors, as shown below. Compare (71) with (60) (repeated below) and (72) with (61) (repeated below).

(71) a. ?? **nani**-o$_i$ dare**ka**-ga [**ittai** t_i t_{ka}] nomimasita **ka**?
what-ACC someone-NOM **ittai** drank **Q**
('What in the world did someone drink?')

b. [**ittai** **nani**-o t_{ka}]$_i$ dare**ka**-ga t_i nomimasita **ka**?
ittai **what**-ACC someone-NOM drank **Q**
'What in the world did someone drink?' (Shigeru Miyagawa, p.c.)

(60) a. ?? dare**ka**-ga **nani**-o nomimasita **ka**?
someone-NOM **what**-ACC drank **Q**
('What did someone drink?')

b. **nani**-o$_i$ dare**ka**-ga t_i nomimasita **ka**?
what-ACC someone-NOM drank **Q**
'What did someone drink?'

(72) a. * **nani**-o$_i$ Taroo-si**ka** [**ittai** t_i t_{ka}] yoma-nai **no**?
what-ACC Taroo-only$_{NPI}$ **ittai** read-NEG **Q**
('What in the world did only Taro read?')

b. [**ittai** **nani**-o t_{ka}]$_i$ Taroo-si**ka** t_i yoma-nai **no**?
ittai **what**-ACC Taroo-only$_{NPI}$ read-NEG **Q**
'What in the world did only Taro read?' (Shigeru Miyagawa, p.c.)

(61) a. ?* Taroo-si**ka** **nani**-o yoma-nai **no**?
Taroo-only$_{NPI}$ **what**-ACC read-NEG **Q**
('What did only Taro read?') (Tanaka 1997a:159)

b. **nani**-o$_i$ Taroo-si**ka** t$_i$ yoma-nai **no**?
what-ACC Taroo-only$_{NPI}$ read-NEG **Q**
'What did only Taro read?' (Tanaka 1997a:162)

We can make one further point about *ittai* from such examples as well, continuing briefly our discussion from section 5. Specifically, we find that scrambling *ittai* itself over intervenors does not obviate the intervention effects. Thus, for the intervenor *John-ka Bill* 'John or Bill' (73b) is no better than (73a) and likewise for the intervenor *hotondo dono hito-mo* 'almost every person' (74b) is no better than (74a). As expected, in (74c), where both *ittai* and the *wh*-word are scrambled over the intervenor, the question is improved.

(73) a. ?? John-**ka** Bill-ga **ittai** **nani**-o katta no?
John-or Bill-NOM **ittai** **what**-ACC bought Q
('What in the world did John or Bill buy?')

b. ?? **ittai**$_i$ John-**ka** Bill-ga t$_i$ **nani**-o katta no?
ittai John-or Bill-NOM **what**-ACC bought Q
('What in the world did John or Bill buy?')
(Shigeru Miyagawa, Takako Aikawa, Kazuko Yatsushiro, p.c.)

(74) a. ??? hotondo dono hito-**mo** **ittai** **nani**-o katta no?
almost which person-MO **ittai** **what**-ACC bought Q
('What in the world did almost every person buy?')

b. ??? **ittai**$_i$ hotondo dono hito-**mo** t$_i$ **nani**-o katta no?
ittai almost which person-MO **what**-ACC bought Q
('What in the world did almost every person buy?')

c. [**ittai** **nani**-o]$_i$ hotondo dono hito-**mo** t$_i$ katta no?
ittai **what**-ACC almost which person-MO bought Q
'What in the world did almost every person buy?'
(Shigeru Miyagawa, p.c.)

The fact that the intervention effect persists in the (b) cases above tells us that *ittai* has in fact scrambled *away from* the launching site of *-ka*; the launching site of *-ka* remains by the *wh*-word, below the intervenor, resulting in an ill-formed question.

Let us now return to consider what characterizes an intervenor. Earlier in this section, we hypothesized that items which contain *-ka* (like *dareka* or *-sika*) qualify as intervenors, and that this was by *virtue* of the fact that they contain *-ka*. The attribution of the difficulty in (59–60) to the intervening *-ka* is strengthened by the fact that not just any quantifier will cause this effect. (75) shows that *minna* 'everyone' (unlike *dareka* 'someone') does not intervene for *-ka* movement. Nor do the focus particles *-made* 'even' (76) and *-dake* 'only', as observed by Yanagida (1996).

(75) ano mise-de-wa **minna**-ga **nani**-o katta **no**?
that store-at-TOP **everyone**-NOM **what**-ACC bought **Q**
'What did everyone buy at that store?' (Miyagawa 1997, class handout)

(76) [**dare**-no tegami-**made**]-ga nakunatta **no**?
who-GEN letter-**even**-NOM disappeared **Q**
'Even whose letter disappeared?' (~Yanagida 1996:34)

The example in (76) is particularly interesting when compared with (77). Both questions involve particles translating as 'even', but *sae* in (77) intervenes, while *made* in (76) does not.

(77) ?* [**dare**-no tegami-**sae**] nakunatta **no**?
who-GEN letter-**even** disappeared **Q**
'Even whose letter disappeared?' (Shigeru Miyagawa, p.c.)

We see that two particles, with roughly the same contribution to the meaning in what appears to be the same structural position, act differently with respect to whether they can intervene between a *wh*-word and the periphery of the clause at which it takes scope. We take this to mean that a particle's role as intervenor is partly a lexical property of particular particles.[35]

It turns out that elements containing *-mo*, like elements containing *-ka*, are *also* barred from intervening (hierarchically) between a *wh*-word and the clause periphery (although perhaps slightly less strongly), as the examples in (78) and (79) indicate.[36,37]

(78) a. ?? dare**mo**-ga **nani**-o kaimasita **ka**?
everyone-NOM **what**-ACC buy **Q**
('What did everyone buy?')

b. **nani**-o$_i$ dare**mo**-ga t_i kaimasita **ka**?
what-ACC everyone-NOM buy **Q**
'What did everyone buy?' (Hoji 1985:270)

(79) a. ?* dono gakusei-**mo** **nani**-o katta **no**?
every student **what**-ACC bought **Q**
('What did every student buy?')

b. **nani**-o$_i$ dono gakusei-**mo** t_i katta **no**?
what-ACC every student bought **Q**
'What did every student buy?'

c. **dare**-ga dono gakusei-ni-**mo** atta **no**?
who-NOM every student-DAT met **Q**
'Who met every student?' (Shigeru Miyagawa, Takako Aikawa, p.c.)

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[35] Of course, it would be nice to show that *sae* 'even' and *made* 'even' differ in some subtle semantic way which can be identified as the source of the "intervernorhood." I suspect this may be possible, though I have not pursued that project here.

[36] I do not at present have any good explanation for why *-mo* would be a weaker intervenor than *-ka*.

[37] Actually, questions like (78a) and (79a) *are* grammatical, but only on a functional reading (not on a pair list reading). It will later be proposed that the function reading arises when *-ka* is launched from higher in the structure (above the intervenor). Thus, these examples are consistent with the argument even in light of the caveat about the functional reading, since *-ka* on the functional reading need not travel over an intervenor. We will return to this in some detail, particularly in chapter 6.

Another case in which *-mo* intervenes is in its use as a particle meaning 'also', as shown by the examples in (80), from Yanagida (1996). She shows that a *wh*-word cannot take scope past the 'also' use of *-mo*, as shown by (80); (80b) is fine (with just a nominative case marker on the subject), while (80a) is bad (with *-mo* 'also').[38]

(80) a. * [John-no **dare**-kara-no tegami]-**mo** nakunatta **no**?
John-GEN **who**-from-GEN letter-MO disappeared **Q**
('Who did John's letter also from disappear?')

b. [John-no **dare**-kara-no tegami]-ga nakunatta **no**?
John-GEN **who**-from-GEN letter-NOM disappeared **Q**
'Who did John's letter from *t* disappear?' (Yanagida 1996:34–5)

Preliminary judgments for the corresponding Sinhala examples also seem to show this effect. Arjuna Wijeyekoon (p.c.) and Sanith Wijesinghe (p.c.) told me that (81a) sounds "wrong" or significantly dispreferred in comparison to (81b) and (81c), which are fine.[39] This pattern also lends support to the idea that Japanese *-mo* corresponds with Sinhala *-t*, an analogy which was suggested in a footnote in chapter 1.

(81) a. ?* kauru-ṭ mokak **də** kiiwe?
who-T what **Q** said-**E**
('What did everyone say?')

b. mokak **də** kauru-ṭ kiiwe?
what **Q** who-T said-**E**
'What did everyone say?'

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[38] It seems that the "conjunctive *-mo*" that appears in *John-mo Bill-mo kita* 'Both John and Bill came' does *not* intervene for *-ka* movement. Although there have been examples cited in the literature that might suggest otherwise (e.g., (i)), people I have checked with have not found any particular contrast. Note also that (ii) appears to be well-formed (unexpected if conjunctive *-mo* is an intervenor; compare with (70c)).

(i) a. (*) [John-**mo** Bill-**mo**] Mary-ni **nani**-o okurimasita **ka**?
John-MO Bill-MO Mary-DAT **what**-ACC sent **Q**
'What did both John and Bill send to Mary?'

b. **nani**-o$_i$ [John-**mo** Bill-**mo**] Mary-ni t_i okurimasita **ka**?
what-ACC John-MO Bill-MO Mary-DAT sent **Q**
'What did both John and Bill send to Mary?' (Tonoike 1992:122)

(ii) [John-**mo** Bill-**mo**] **ittai** **nani**-o si-te-ir-u **no** **da**?
John-MO Bill-MO **ittai** **who**-ACC do-TE-be-PRES **Q** COP
'What in the world are both John and Bill doing?' (Tonoike 1992:122)

Another paradigm in which *-mo* does not act quite like *-ka* is in the "concessive" construction like (i)).

(i) dare-ga kite-**mo** hookoku-si-te-kudasai
who-nom come-MO report-do-please
'Report to me if x comes, for all people x.' (Nishigauchi 1991:204–208)

If concessive constructions were derived like questions, with *-mo* moving from some clause-internal position to its surface, clause-peripheral position, we would expect intervention effects just as in questions. What I have found is that the order between a *wh*-word and an intervenor inside a concessive clause does not seem to matter (unlike in questions). I will have to leave further investigation of this topic for another time.

[39] Dileep Chandralal (p.c.) indicated that (81a) does improve with an answer like '*his name*', which seems to be parallel to the fact about Japanese mentioned in footnote 37 (and to which we return in chapter 6).

c. Chitra mokak **də** kiiwe?
Chitra what **Q** said-**E**
'What did Chitra say?'

(Arjuna Wijeyekoon, Sanith Wijesinghe, Kumara Henadeerage, p.c.)

The data from Japanese that we have reviewed in this section supports two generalizations. First, *-ka* and (at least certain instances of) *-mo* appear to share properties; they are in a nontrivial way the same kind of thing. We had hypothesized this to be true back in chapter 1, based primarily on their basic distribution. Now, we have additional evidence from the fact that the both can interfere with movement of *-ka* in questions. The second generalization supported by the data above is that, in a *wh*-question, a *-ka* or *-mo*-type element cannot intervene between a *wh*-word and the clause periphery. We can make sense of this generalization if *-ka* must move overtly from a position by the *wh*-word, and movement of the closest element is accomplished by an attraction operation which cannot distinguish between *-ka* and *-mo*.

The overall descriptive conclusion we can draw from the data presented in this section is that the launching site of *-ka* cannot be separated from the clause periphery by either *-ka* or (certain instances of) *-mo*. To reiterate the theoretical conclusion, this is evidence that (a) *-ka* and *-mo* are the same kind of element syntactically, (b) in questions, *-ka* moves from a clause-internal position to the surface, clause-final position.[40]

7. The long and mysterious journey of Q

The proposal that is being put forward has an unusual property with respect to the locality conditions often assumed for movement. Specifically, in the languages we have been looking at, the question particle (Japanese *-ka*, Sinhala *də*, Okinawan *-GA*, etc.) looks like a syntactic *head*. First of all, it is a small, monosyllabic particle.[41] Second, these are head-final languages, and the question particle appears where we would expect a head to appear, following the associated constituent.

What makes this unusual is that, under the proposal we have been exploring, these question particles seem to travel over quite long distances. If true, this is in direct conflict with the Head Movement Constraint ("HMC"), introduced by Travis (1984) and widely adopted in subsequent literature. The HMC states that a head cannot be moved over an intervening head, yet the question particle appears to do just that (e.g., moving over

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[40] As also suggested by (77) above, the data in (i) from Yanagida (1998) also seem to classify *-sae* 'even' with *-ka* and *-mo* as having the property of being an intervenor.

(i) a. ?* John-wa Mary-ni-**sae** nani-o okutta no?
John-TOP Mary-DAT-**SAE** what-ACC sent Q
('What did John send even to Mary?')

b. nani-o$_i$ John-wa Mary-ni-**sae** t$_i$ okutta no?
what-ACC John-TOP Mary-DAT-**SAE** sent Q
'What did John send even to Mary?' (Yanagida 1998:21–22)

[41] Being a monosyllabic particle makes an analysis of Q as a head *plausible*, of course, but no *serious* argument can be made from its monosyllabicity if we want to include things like Japanese *-koso* or the Sinhala complementizer *kiyəla* in the class of heads. Thanks to David Pesetsky (p.c.) for calling this to my attention.

Tense). The HMC is worthy of mention here because it has been so widely assumed, but the stance I will take here is that the HMC does not in fact constrain the movement of Q. In the syntactic framework I adopt here, feature attraction drives movement of the closest element with the relevant feature. If a feature F is being attracted and a head H carries the feature F, movement of H will only be blocked if there is an intervening head which also carries the feature F. Any head which does not carry this feature is irrelevant. My assumption is that the cases which were accounted for by the HMC can be accounted for instead in terms of the features being attracted, although I will not attempt to do the reanalysis here.

Examples of long distance movement are given below, for Sinhala in (82), and for Japanese in (83).

(82) a. mamə[Ranjit [Chitra **monəwa də** dækka kiyəla] kiiwe kiyəla] dannəwa.
I Ranjit Chitra **what** **Q** saw that said-**E**that know
'I know what Ranjit said that Chitra saw.'

b. mamə[Ranjit [Chitra **monəwa** dækka kiyəla] kiiwa **də** kiyəla] dannəwa.
I Ranjit Chitra **what** saw that said **Q** that know
'I know what Ranjit said that Chitra saw.' (Kishimoto 1997:19)

(83) boku-wa [John-ga [Mary-ga **nani**-o katta to] itta **ka**] sitteiru.
I-TOP John-NOM Mary-NOM **what**-ACC bought that said **Q** knows
'I know what John said that Mary bought.'

The Sinhala examples show the distance more clearly, since in (82a) we can see both where *də* is moving from (its surface position) and where *də* is moving to (the 'E'-marked verb), and in (82b) we can see that the movement can actually happen (since it has happened overtly). The path between *monəwa* 'what' and *də* 'Q' in (82b) even crosses a clause boundary.[42]

Schauber (1979) argued for a very similar conclusion for questions in Navajo.[43] *Wh*-words in Navajo remain in situ and appear with a question particle *-lá* (or *-sh*). There are generally two options; *-lá* can appear on the *wh*-word, or it can appear in "second position." The two possibilities are illustrated in (84).

(84) a. Jáan hái-**lá** yiyiiłtsą́?
John who-**Q** 3.3.saw
'Who did John see?'

b. Jáan **lá** hái yiyiiłtsą́?
John **Q** who 3.3.saw
'Who did John see?' (Schauber 1979:197)

[42] However, we have seen reason to believe (cf. section 5 and further discussion coming up in chapter 4) that Q moves successive-cyclically (in Japanese, and presumably also in Sinhala).
[43] Thanks to Peggy Speas (p.c.) and Ken Hale (p.c.) for suggesting that I look at Navajo.

Barss, Hale, Perkins & Speas (1991) point out that in multiple questions, only one question particle is allowed, which adds support to the identification of Navajo *-lá/-sh* with the question particles in Japanese, Sinhala, etc.[44]

(85) a. * hái-**lá** ha'át'íí-**lá** nayiisnii'?
who-**Q** what-**Q** bought
('Who bought what?')

b. hái-**lá** ha'át'íí nayiisnii'?
who-**Q** what bought
'Who bought what?' (Barss et al. 1991:34)

c. hái ha'át'íí-**lá** nayiisnii'?
who what-**Q** bought
'Who bought what?' (Peggy Speas, p.c.)

Let us suppose that movement of *-lá* to second position in Navajo is the same type of movement as movement of *-ka* to the right periphery in Japanese (perhaps head-movement to an interrogative complementizer). As we saw for the other languages, movement of Q in Navajo is similarly unbounded; in (86), the question particle *-lá* appears in second position, separated from the *wh*-word *háágóó* 'where' by probably two clause boundaries (although, again, we will assume this movement occurred successive-cyclically).

(86) Jáan **lá** Bíl Mary **háágóó** díínáát yiłní ní?
John **Q** Bill Mary **where.to** 2.FUT.go 3.3.say 3.say
'Where did John say Bill told Mary to go?' (Schauber 1979:202)

What we have seen in this section is that movement of Q, which we have analyzed as a head (at least for Japanese, Sinhala, Okinawan, and now Navajo), is not constrained by locality conditions like the HMC.[45] In previous sections of this chapter have seen extensive evidence (from Japanese) that such movement is constrained from crossing other instances of Q-like particles (e.g., *-ka* and *-mo* in Japanese).

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[44] As Hale & Platero (to appear) point out, *wh*-words in Navajo share a base with negative polarity items and indefinites, making it another in the growing class of languages we have been cataloging with this property. Thus, indefinite *hái-shíí* 'someone' is based on *hái* 'who', as is *hái-da* 'anyone' (Hale & Platero to appear). Note that the particle forming the indefinite is *shíí* and not *lá* (the question particle used in the example question in the text), though one *might* imagine *-shíí* could be related to the question particle *-sh*. Also, as mentioned in footnote 9, *-shíí* can be used as a dubative particle (Young & Morgan 1980:63), like Sinhala *də* and Japanese *-ka*.

[45] Hale & Platero (to appear) confront essentially the same issue with respect to a particle (*-í-*) in Navajo which moves in certain negative constructions to be realized as a verbal suffix, but they reach the opposite conclusion; they claim that the particle is a maximal projection, mainly in order to *preserve* the Head Movement Constraint. They point out (attributing the observation to Maria Bittner) that it is conceptually possible that a structural specifier might be *morphologically* realized as a suffix, rendering the suffixal placement of the particle inconclusive as evidence that *-í-* is a head. While their approach does permit retention of the HMC as a universally applicable constraint, it would complicate the analysis we have been developing for Japanese, etc., since it would require positing an empty head in the specifier of which *-ka* resides. Moreover, it leaves mysterious the fact that in all of these languages these particular elements would be realized as suffixes when otherwise specifiers appear to be on the left.

8. Chapter two in review

Let me now review more concisely the proposal that has been made in this chapter. In the languages we have looked at, there is a Q morpheme which is overtly identifiable (*-ka* in Japanese and premodern Japanese, *də* in Sinhala, *-GA* in Okinawan, *lá* or *-sh* in Navajo) and which moves from a clause-internal position in questions to the clause periphery. This movement is driven by an element which is generated at the clause periphery, which we have taken to be the head (perhaps an interrogative complementizer) which contributes the interrogative force to the utterance. This element (or some feature of this element) is responsible for the surfacing clause-peripheral morphology in the languages which do not move Q overtly (e.g., the 'E' in Sinhala, the adnominal *musubi* form in premodern Japanese, the *musubi -ra* in Okinawan). We have also seen that this construction is not in general limited to questions, but also occurs in focus constructions in all of these languages.

We have made use of two kinds of evidence to show that there is actual movement of Q from a clause-internal position to a clause-peripheral position. The first kind of evidence came from the use of island boundaries. In Sinhala, Okinawan, and premodern Japanese, Q appears overtly in its launching site (only covertly moving to the clause periphery in such cases). This property allowed us to see the effect of separating the launching site of Q from the clause periphery by an island boundary; the effect, we saw, was that the question becomes ill-formed. This is consistent with the proposal that Q moves, assuming that islands block movement.

The second kind of evidence came from "intervention effects." In these cases, we saw that the path of Q from its launching site to its clause-peripheral position is forbidden to cross a certain class of elements. Assuming that movement is a feature-driven process of attraction constrained to attract the *closest* instance of the sought-after feature (see, e.g., Chomsky 1995 for discussion), this kind of intervention effect is expected if the class of intervenors share with Q the feature that is being attracted.

As we investigated the island effects, we discovered an interesting fact about Q, which is that it is possible for Q to be launched from *outside* an island. In Sinhala and the other languages which show Q in its launching site, it was possible to see Q sitting in this position on the surface. In Japanese, where Q always moves *overtly* to the clause periphery, it was nevertheless possible to detect the effects of an island-external launching site for Q; among other things, it gives us an account of the well-known fact that Japanese allows *wh*-words inside of islands.

Because Q moves overtly in Japanese, ascertaining the position from which Q launches is somewhat more difficult and required more intricate argumentation. We saw that we could make use of the emphatic *ittai* '...in the world' in Japanese as an upper bound for the launching site of Q. Thus, placing *ittai* inside an island in a Japanese question was parallel to placing *də* inside an island in a Sinhala question; it implies that Q must move to the clause periphery across the island boundary, and as a result yields an ill-formed question. We also saw that when *ittai* is outside an island containing a *wh*-word in Japanese, the result is well-formed again; this lends plausibility to the hypothesis that Q in Japanese, as in Sinhala, can be launched from just outside an island. Of course, the very

fact that *wh*-words are allowed inside islands in Japanese suggests that this must be true, but the facts about *ittai* lend additional credibility to this account.

Looking at the structure of *ittai* more closely, we were able to draw a parallel between *ittai* and numeral quantifiers, which gives it additional support as a diagnostic for the launching site of Q, and also provides an argument that Q moves successive-cyclically to the interrogative complementizer, stopping also at the declarative complementizers along the way. In chapter 4, we will see even more striking evidence for this.

The fact that Q can launch from outside islands allowed us to see an interesting interaction between islands and intervention effects. Because the intervention effect is due to Q crossing an "intervenor" (such as *John-ka Bill* 'John or Bill' in Japanese) on its way to the clause periphery, if we use an island boundary to cause Q to launch from above the intervenor, the intervention effect disappears. Practically speaking, this means that if a sequence yields an intervention effect, the ill-formedness can be obviated by embedding the sequence inside an island. This provides fairly dramatic (and otherwise counter-intuitive) support for the proposals made in this chapter.

I should point out again here that the "launching site" of Q (by which I mean the position from which Q is attracted by the interrogative complementizer) is *not* necessarily the same as the base position of Q. In chapter 4, this will be discussed in some detail, but to preview the conclusion we will arrive at there, it will proposed that in cases where the launching site of Q is at the edge of an island containing a *wh*-word, Q actually *moved* to the launching site first.

In this chapter, we have focused entirely on questions which contain only a single *wh*-word. In the next chapter, we will look at more complicated questions, such as questions which contain multiple *wh*-words, or questions that contain quantifiers like *daremo* 'everyone' in Japanese.

Chapter 3 Complex questions

In most of the world's languages, "multiple questions" can be formed with more than one *wh*-word. A simple example from English is given in (1).

(1) **Who** bought **what**?

Multiple questions are possible in Japanese, as in (2).

(2) **Dare**-ga **nani**-o kaimasita-**ka**?
who-NOM **what**-ACC bought.POL-**Q**
'Who bought what?'

Under the approach we have been taking to Japanese question formation, the existence of multiple questions raises an interesting issue. The claim has been that the question marker *-ka* in a single *wh*-question originates clause-internally somewhere near the *wh*-word and moves overtly to its clause-peripheral position. Where, then, does the *-ka* that appears at the periphery of a multiple question originate?

As a starting point, notice that there is only a single *-ka* surfacing at the clause periphery. Given that, the null hypothesis is that a single instance of *-ka* can in some way participate in a multiple-*wh*-question reading with more than one *wh*-word. The question we will try to address in this chapter is where this *-ka* originates, assuming that it will move to the clause periphery parallel to the single-*wh*-question case.

Before directly confronting Japanese, we will look at the morphemes which correspond to Japanese *-ka* in Sinhala (*də*) and Okinawan (*-GA*) to see where they appear in multiple questions. Under the hypothesis we developed in the last chapter, the structural position in which these morphemes surface in Sinhala and Okinawan should correspond to the launching site of *-ka* in Japanese. We will also look briefly at *wh*-questions in German as well. The last sections of this chapter will consider *wh*-questions that contain quantifiers (such as *What did everybody buy?*) and discuss certain issues that arise. This discussion will touch on the properties of such questions in German, Japanese, and Chinese.

As a whole, this chapter remains quite speculative. Many avenues remain unexplored, many decisions are left unmade, and the analyses presented here only scratch the surface of the full complexity of the problems. Nevertheless, it is useful to see the direction in which the approach to questions developed in chapter 2 pushes us.

1. Constituency and the multiple question I: Sinhala and Okinawan

In Sinhala, there are two logically possible ways to ask the question *Who read what?*, shown below in (3).

(3) a. **kauru mokak də** kieuwe?
who what Q read-**E**
'Who read what?'

b. * **kau də mokak** kieuwe?
who Q what read-E
('Who read what?') (Kumara Henadeerage, Sanith Wijesinghe, p.c.)

Of these two possibilities, only (3a), where the *də* particle appears next to the *wh*-object, is grammatical.[1] (3b), where *də* appears on the *wh*-subject, is much worse.[2]

Sumangala (1992) provides the examples of multiple questions in (4); in each one, *də* has already reached the clause periphery. In (4a), the matrix clause is a yes-no question (accounting for the clause-final *də*), and the embedded clause is a multiple *wh*-question (with a single, clause-peripheral *də*). (4b) is a matrix multiple question, but because it involves *kiidenek* 'how many (animate)' and *kiiyak* 'how many', *də* can move overtly to the clause periphery (as discussed in chapters 1–2).

(4) a. **kauru mokak** kivva **də** dannəva **də**?
who what said **Q** know **Q**
'Do you know who said what?'

b. **kiidenek** pot **kiiyak** gatta **də**?
how.many books **how.many** bought **Q**
'How many people bought how many books?' (Sumangala 1992:236)

Because *də* is already at the clause periphery, (4) does not provide evidence for where *də* launched from, but the contrast from (3) suggests that *də* has moved from the lower of the *wh*-words.

Perhaps the murkiest issue about multiple questions in Sinhala (and in Okinawan, as we will see in a moment) has to do with multiple occurrences of the question marker. Kishimoto (1997) reports that it is possible to ask a multiple question with *də* marking each *wh*-word; he contrasts this with the behavior of focus markers like *tamay*, giving the examples in (5).

(5) a. kau **də** monəwa **də** kieuwe?
who **Q** what **Q** read-E
'Who read what?'

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[1] Every non-linguist native speaker of Sinhala that I consulted about these multiple questions was quite hesitant to accept them at all, telling me that such things are normally asked as separate questions. Multiple questions are clearly uncommon, perhaps more unusual than multiple questions are in English, but they still appear to be possible at least according to some speakers. Jim Gair (p.c.) told me that one of his consultants produced a multiple question parallel to (3a) spontaneously. Kumara Henadeerage (p.c.) indicated that while questions like (3a) are somewhat marginal as matrix questions, they improve a great deal when embedded (e.g., as in (i)). It seems to me that the same is true in English.

(i) a. kauru mokak də kieuwe kiyəla dannəwa də?
who what Q read-E that know Q
'Do (you) know who read what?'

b. * kau də mokak kieuwe kiyəla dannəwa də?
who Q what read-E that know Q
('Do (you) know who read what?') (Kumara Henadeerage, Dileep Chandralal, p.c.)

[2] Jim Gair (p.c.) indicated that to his ear (3b) has a reading like 'Who read something?' (i.e., construing one of the *wh*-words as an indefinite).

b. * Chitra **tamay** ee potə **tamay** kiuewe.
Chitra **FOC** that book **FOC** read-**E**
('Certainly, Chitra read that book.') (Kishimoto 1997:14)

My consultants seemed to find examples like (5a) "acceptable but not really good." Sumangala (1992) notes examples of this type, and does indicate that they can be a multiple question. However, Sumangala argues (based on a suggestion from James Gair, p.c. to Sumangala) that (5a) is in fact an elliptical version of the conjoined question in (6), and not a basic form.

(6) kau **də** kiewe monəwa **də** kiewe?
who **Q** read-**E** what **Q** read-**E**
'Who read, what did s/he read?' (~Sumangala 1992:234)

Sumangala points out that in order to get a multiple question reading, both *wh*-words in (5a) must be stressed,[3,4] and even under those conditions, it is not possible to get a "list of pairs" reading. Rather, (5a) can only be answered with a single pair (i.e. a person, and a book which that person read).[5] Likewise, (6) can only be answered with a single pair, giving the derivational connection between (6) and (5a) added plausibility. On the other hand, multiple questions like those in (4) *can* be answered by lists of pairs.

Based on this (admittedly somewhat shaky) evidence, we will conclude that structures like (3a) represent the primary form for multiple questions in Sinhala.

We now turn to Okinawan, which behaves in much the same way as Sinhala does, and which raises many of the same questions as well. Recall that in Okinawan embedded single questions, a "*kakari*-morpheme" *-GA* (the question marker, corresponding to Sinhala *də*) appears next to the *wh*-word, and a *musubi* morpheme *-ra* (a verbal suffix corresponding to Sinhala 'E') appears at the clause periphery.[6] Examples which show simple single-*wh* cases are repeated below from chapter 1.

(7) a. wan-ya [Taruu-ga **nuu**-GA kam-yi-**ra**] chichibusaN.
I-TOP Taru-TOP **what-Q** eat-PRES-**M** want-to-hear
'I want to hear what Taru eats.'

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[3] If only one of the *wh*-words is stressed, the other is read as an indefinite; recall from chapter 1 that a *wh*-word with *də* attached (like *mokak də* 'something') is an indefinite if not connected to the clause periphery. It is perhaps surprising that a reading like 'what did someone read?' would be possible, given the sub-grammatical status of *dareka nani-o yonda no?* 'what did someone read?' in Japanese. That is, we would expect an intervention effect (as discussed in chapter 2) to block that reading. I have not been able to verify this fact one way or the other, however.

[4] It may or may not be relevant that this is also true in English. *Wh*-words in situ generally receive stress in English, although fronted *wh*-words seem not to require stress. It is clear that a more systematic study of the effect of stress in questions is needed, although it is not undertaken here. Thanks to David Pesetsky (p.c.) for pointing this out to me.

[5] Sumangala (1992) further argues against Kishimoto's claim that two *focus* markers are disallowed as well (i.e., (5b)) by setting up a pragmatic context in which (5b) is actually acceptable.

[6] Recall that, to avoid confusion which might arise from the homophony between the *kakari* ('Q') morpheme and the nominative marker, the *kakari* morpheme is transliterated in small caps.

b. wan-ya [**taa**-ga-GA ringo kam-yi-**ra**] chichibusaN.
I-TOP **who**-NOM-**Q** apple eat-PRES-**M** want-to-hear
'I want to hear who eats apples.' (~Sugahara 1996:236-7)

As was true of Sinhala, the question of where the *kakari* 'Q' marking is allowed to surface is not at all clear. Some consultants I asked did not find any particular restrictions on which *wh*-word is marked with *-GA*, but there are hints of an interpretational difference. Consider the two utterances in (8), which differ only with respect to which *wh*-word is marked with the *kakari* morpheme.

(8) a. **taa**-ga-GA **nuu** kam-ta-**ra**
who-NOM-**Q** **what** eat-PAST-**M**
'(I wonder) who ate what.'

b. **taa**-ga **nuu**-GA kam-ta-**ra**
who-NOM **what**-**Q** eat-PAST-**M**
'(I wonder) who ate what.' (~Sugahara 1996:246)

Mariko Sugahara (p.c.) told me that her consultant found (8a) to require a "pair list" reading, enumerating, for each food (that the participants already have in mind), who ate that food. In Sugahara (1996), she reports this as a "D-linked" reading.[7] Rumiko Shinzato Simonds (p.c.) agreed in essence, although she indicated that the specific foods need not necessarily be in mind. However, she did say that (8a) presupposes that somebody ate something, and she seemed to agree that it is the *foods* which must be exhaustively paired with people. By contrast, (8b) does not force such an interpretation, according to Sugahara's consultant, and R. Simonds (p.c.) told me that (8b) sounded "like a regular *wh*-question", unlike (8a).[8] Other reports I received did not seem to differentiate between (8a) and (8b).

Another delicate question concerns whether both *wh*-words in Okinawan can be marked with a *kakari* morpheme (cf. the discussion of Sinhala (5a)). Sugahara (1996) reports that utterances like (9) are ill-formed, but Miyara (1998:28) marks such examples as grammatical. Other consultants I asked seemed to accept these examples, although I do not have information about the possible readings (again, cf. the discussion of Sinhala (5a)).

(9) (?*) **taa**-ga-GA **nuu**-GA kam-ta-**ra**.
who-NOM-**Q** **what**-**Q** eat-PAST-**M**
('(I wonder) who ate what.') (~Sugahara 1996:246)

Thus, it seems that the evidence from Okinawan, like the evidence from Sinhala, is shaky at best. However, the *tendency* seems to be in the same direction; if there is a most

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[7] "D-linked" refers to Pesetsky's (1987) term (short for "Discourse-linked") for a reading of *wh*-words that seems to presuppose a set of alternatives in the discourse environment shared by and salient for both participants.

[8] More accurately, she indicated that (8a) was a more appropriate *kakari-musubi* construction than (8b); of (8b) she said that it "does not sound like a *kakari* sentence, but like a regular *wh*-question." She is a native speaker of the Yonabaru dialect, but indicated that it is very similar to the Shuri dialect.

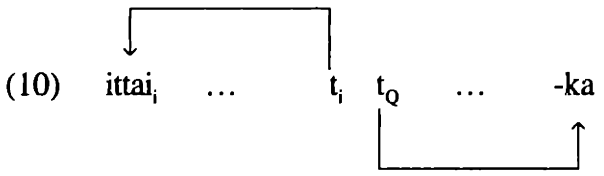
natural place to put the 'Q' marker, it is on the object *wh*-word (when both subject and object are *wh*-words).[9]

2. Constituency and the multiple question II: Japanese

Looking at Sinhala and Okinawan has given us an idea of what to look for in Japanese, which we turn to now. We are operating under the hypothesis that *-ka* (Japanese), *də* (Sinhala), and *-GA* (Okinawan) correspond to one another, and so we will now look for evidence that might establish the launching site of Japanese *-ka* in a normal, multiple question. The goal of this section is to look for Japanese-internal evidence to support the hypothesis that in (normal) multiple questions, *-ka* launches from a position next to the hierarchically lowest *wh*-word.

In keeping with the other strong parallels we have seen between Sinhala, Okinawan, and Japanese so far, it is not really surprising that the evidence for the base position of *-ka* in Japanese multiple questions is correspondingly delicate. Like the contrasts in the previous sections, the judgments seem to have a tendency but are by no means sharp or absolute.

Let us start the investigation of Japanese by considering the effects of *ittai* '...in the world' in multiple *wh*-questions. As discussed in chapter 2, we can use *ittai* to localize the launching site of *-ka*, given that *ittai* must be originally adjacent to the launching site of *-ka* and can only scramble upward. The structure of a *wh*-question with *ittai* is illustrated in (10), where t_Q represents the launching site of *-ka*.



Multiple-*wh*-questions have two possible readings, a "single pair" reading, and a "pair list" reading, which I indicate by marking glosses with "PL" (pair list) and "SP" (single pair) notations. On certain days of the week, for certain speakers,[10] there is a contrast between the questions in (11) in the availability of the single pair reading. (11a) and (11b) differ only in the position of *ittai*. When *ittai* appears between the *wh*-words, the pair-list reading is strongly favored if not forced.[11,12]

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[9] This conforms to the general *pattern* Sugahara (1996) reports, although the contrasts appear to be much more delicate than was reported there.

[10] This particular description of the judgment volatility was coined by David Pesetsky. Cf. Mike Barnicle's column "I was just thinking..." in the *Boston Globe*, August 2, 1998, and related coverage in the *Boston Globe* through late August, 1998.

[11] At least part of the difficulty with these examples is that it is very difficult to judge a single-pair reading as being unavailable, simply because one must be aware of the possibility of a single-membered list of pairs; that is, a question might be *requesting* a list of pairs and *happen* to be answered by a list that contains only a single member. Whatever tendency there is in (11a) may be shared by the English question *Who bought what?*, which resists a single-pair reading, as pointed out to me by Howard Lasnik (p.c.) (who attributes the observation to Marc Ryser); yet this effect also seems to be pragmatically overridable (e.g.,

(...continues) ➡

(11) a. dono hito-ga **ittai** nani-o katta no?
which person-NOM **ittai** what-ACC bought Q
'Which person bought what (in the world)?' (PL, (*)SP)

b. **ittai** dono hito-ga nani-o katta no?
ittai which person-NOM what-ACC bought Q
'Which person (in the world) bought what?' (PL, ?SP)
(Shigeru Miyagawa, p.c.)

We will review a stronger, slightly more convincing contrast in a moment, but the paradigm above *suggests* that if *-ka* launches from below the subject *wh*-word, the pair-list reading results.

Suppose that the pair-list reading relies on *-ka* launching from below (at least) one of the *wh*-words (a proposal which we will make explicit in the next section). If so, we can connect this in an interesting way to the discussions from chapter 2 of the launching site of *-ka* in the context of islands.[13] Specifically, we have seen that *-ka* is attracted to the clause periphery from a position outside of islands, so if two *wh*-words appear inside an island, we expect that no pair-list reading should be available between them. This is because *-ka cannot* have launched from below the highest *wh*-word (a prerequisite for the pair-list reading), since both *wh*-words are inside the island.[14] The data bears this out, and with examples which are somewhat more robust in their judgments. (12) below can only receive a single answer, specifying who bought something and what they bought.

(12) Taroo-ga [**dare**-ga **nani**-o katta toki-ni] okotta no?
Taroo-NOM **who**-NOM **what**-ACC bought when got.angry Q
'Taroo got angry when who bought what?' (*PL, SP)
(Shigeru Miyagawa, Takako Aikawa, p.c.)

In fact, (13), which is like (12) except for having a matrix subject *wh*-word outside the island, can get a pair-list reading but only where the pairs are of a particular kind; they must pair a person with a person-object purchase pair. That is, it can be answered with a list of

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(continued...)
"All right. Who broke what?", asked the boss of his employees, who were standing around an unidentifiable jumble of fragments.). There seem to be effects of stress and pitch that correlate with the available readings, although I have not done any systematic tests and the judgments seem extremely murky.

[12] Pesetsky (1987:124), citing a judgment from Kitagawa (1984), rates a question exactly parallel to (11a) as being ill-formed (the specific example given and rated was *??dare-ga ittai nani-o tukamaeta-no?* 'who caught what (in the world)?'). I have no explanation for the difference in judgments, although both Shigeru Miyagawa (p.c.) and Mamoru Saito (p.c.) have reported to me that such examples are good *at least* on the pair-list reading.

[13] Thanks to Shigeru Miyagawa (p.c.) for bringing this prediction to my attention.

[14] Norvin Richards (p.c.) pointed out that the "LF pied piping" view (presented most thoroughly by Nishigauchi 1990) may also predict a lack of pair-list reading with two *wh*-words inside the same island, depending on how pair-list readings are to be analyzed (this is an aspect of the analysis that Nishigauchi does not spell out). The idea behind LF pied piping is that an island containing a *wh*-word (or in this case two *wh*-words) moves to CP as if the whole island were a *wh*-word (rather than moving the *wh*-word out of the island to CP). We will return to discuss the LF pied piping view in slightly more detail in chapter 4.

angered people and the (single) buying event (i.e. a pair of buyer and buyee) that angered each of them.

(13) **dono hito**-ga [**dare**-ga **nani**-o katta toki-ni] okotta no?
which person-NOM **who**-NOM **what**-ACC bought when got.angry Q
'Which person got angry when who bought what?' (person-event pairs only)
(Shigeru Miyagawa, Takako Aikawa, p.c.)

In short, we see that when two *wh*-words are inside an island, values must be specified for both at the same time.

Although there are other tests which can be easily imagined (for example, placing elements that are known to intervene for *-ka*-movement—like disjunctive *-ka*, *daremo*, *-sika*—along the path *-ka* would have to travel to yield a pair-list reading), these tests all seem to yield unclear results. I suspect that the delicacy of the judgments (as well as those discussed above and in the previous section) ultimately stems from the influence of stress/prosody on the representations, but I have so far been unable to pin down its precise effects.

Despite these difficulties, let us (necessarily somewhat tentatively) press ahead and suppose that the tendencies we have seen reflect a real systematicity to be accounted for. The next section contains a proposal to this end.

3. Antisuperiority in Japanese and Sinhala

Based on the patterns observed above in Japanese, Sinhala, and Okinawan multiple questions, there are two separate generalizations we can make about the launching site of the Q morpheme (i.e. *-ka*, *də*, *-GA*) in multiple questions.[15] The first of them, in (14), concerns the reading a multiple question gets. What (14) says is that the pair-list reading of multiple-*wh*-questions arises when Q launches from a position below (at least) one *wh*-word. This generalization will follow from the semantics we propose for such questions in

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[15] The two generalizations in (14) and (15) are both descendents of Watanabe's (1992b) proposal, part of which is the "anti-superiority effect" given in (i) below (verbatim from Watanabe 1992b).

(i) ANTI-SUPERIORITY EFFECT (Watanabe 1992b:16)
The *wh*-phrase that is moved first cannot c-command the other *wh*-phrase that takes the same scope.

Under Watanabe's (1992b) account, one (phonologically empty) *wh*-operator (in Japanese) moves overtly to SpecCP, and (i) is a generalization about which one moves. Recasting (i) into our terminology the "*wh*-phrase that is moved first" is the *wh*-phrase by which the Q morpheme starts.

Watanabe's syntactic analysis (including (i)) does not mesh well with the overall syntactic framework that we are adopting here; in particular, it conflicts with our assumptions that (a) movement is driven from above, and (b) movement is always of the closest eligible object to the attracting head. If (i) were correct, this attraction would have to be able to, in this special case, "look past" any intervening *wh*-elements and fix on the structurally lowest of them. By recasting (i) as a generalization about where the (single) Q element is launched from (as we are about to do in the text), we avoid this problem. In particular, the analysis we are developing involves only a single movement, the movement of Q to the clause periphery. Where Q launches from is irrelevant from the point of view of Attract, since nothing needs to be "overlooked" in order to move Q from whatever position it is found (according to (i), next to the structurally lowest *wh*-word) to the edge of the clause.

chapter 6.[16] We will focus on additional support for this generalization in the remainder of this section.

(14) PAIR-LIST ANTISUPERIORITY GENERALIZATION
A multiple-*wh*-question gets a pair-list reading when
not all *wh*-words are in the scope of Q

The second generalization that is suggested by the data reviewed in the previous section is (15). What (15) says is that Q starts out by the lowest *wh*-word; the generalization is phrased in a slightly vague manner in anticipation of a more detailed discussion of the base position of Q in chapter 8.[17]

(15) Q-INTRODUCTION ANTISUPERIORITY GENERALIZATION
The base position of Q is as low in the tree as possible;
Q starts close to the lowest *wh*-word.

The tendencies of Sinhala and Okinawan reported in the previous section support (15), but we will review further evidence for both (14) and (15) below in this section.

In order to account for the data we will see in this section, we will need to make a couple of further assumptions. The first of these has been argued for by Miyagawa (1997b), and will be relevant for questions in Japanese with *wh*-words in each of the two object positions of a ditransitive verb. Although we will not review the arguments here, the conclusion Miyagawa (1997b) reaches is that both versions of the ditransitive clauses shown in (16) exhibit the base-generated order of the internal arguments. That is, both dative-accusative and accusative-dative orders are possible as base-generated structures. Thus, in (16a), *piza-o* 'pizza-ACC' is the hierarchically lowest argument, while in (16b), *Mary-ni* 'Mary-DAT' is.

(16) a. John-ga Mary-ni piza-o ageta.
John-NOM Mary-DAT pizza-ACC gave
'John gave Mary pizza.'

b. John-ga piza-o Mary-ni ageta.
John-NOM pizza-ACC Mary-DAT gave
'John gave Mary pizza.' (Miyagawa 1997b:1)

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[16] To anticipate the discussion in chapter 6. the reason that it is important for Q to start below one of the *wh*-words to get a pair-list reading is that the semantic value of a pair-list reading is a *set* of questions. As proposed in chapter 5, the semantic value of a *wh*-word is a set, and at the launching site of Q, one member of that set is chosen (the launching site of Q is semantically interpreted as a choice function variable). So, Q must have a *wh*-word in its scope in order to be a *wh*-question, but there must also be a *wh*-word *outside* the scope of Q in order to yield a *set* of *wh*-questions. Crucial to this explanation is the mechanism of flexible functional application, also introduced in chapter 5.

[17] As has also been alluded to in chapter 2, the discussion in chapter 4 concerns the question of where Q is base-generated when the lowest *wh*-word is inside an island; is Q base-generated adjacent to the *wh*-word (internal to the island), moving to its island-peripheral "launching site"? Or, is Q base-generated *at* its island-peripheral launching site? Chapter 4 contains evidence showing that Q does in fact start *inside* the island in such cases, and in chapter 8 we tighten (15) to require Q to be generated as a *sister* to the *wh*-word.

(17) *Base order of objects in ditransitives* (following Miyagawa 1997b)
In a ditransitive, the base order may be either dative-accusative or accusative-dative.

Notice that this interacts with the Q-introduction Antisuperiority generalization from (15); since the base position of Q is by the lowest *wh*-word, if both the theme and goal arguments are *wh*-words, Q can start by either of them (depending on which was lowest in the particular base structure). From the data we will review below, it appears that the dative-accusative order (e.g., (16a)) is the most unmarked; it turns out to be somewhat marginal to base-generate Q by the dative argument (which would happen in the reversed accusative-dative order).[18] We will see that this kind of "argument reversal" also appears to be possible in Sinhala, although my consultants did not report any marginality in the relevant reversed cases.

The other two assumptions we need to make are simply stipulated here; one would hope to derive these from other principles, but such a task is not attempted here. The first assumption is given in (18); it says that (in Japanese) a *wh*-word base-generated with Q cannot be scrambled away, stranding Q.[19,20] Another way to think of this is that a *wh*-word generated by Q is structurally in the complement of Q and that the maximal projection of Q is an island for scrambling.

(18) NO Q-STRANDING IN JAPANESE
Q cannot be stranded (in Japanese).

The last assumption/stipulation we need to make is in (19). In the data I have collected from Sinhala, for each case that we would predict that a single-pair reading is forced, the example is instead judged to be simply ungrammatical. To put this another way, we could say that Pair-list Antisuperiority is an *absolute* constraint on grammaticality in Sinhala.[21]

(19) NO SINGLE-PAIR READINGS IN SINHALA
A multiple-*wh*-question forced to have a single-pair reading
will be judged ungrammatical.

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[18] I have not investigated in detail why this might be, although clearly (16b) is not marginal. Miyagawa (1996) proposes that the "dative" in accusative-dative order is really a postpositional phrase and that the theme argument moves over it; that is, dative-accusative *is* the universal base order, but when the dative is a postpositional phrase, movement of the theme argument is forced. If we take this view, the reason attaching Q to a dative *wh*-word is marginal might be that Q does not like to attach to a postpositional phrase. This opens up many questions (for example, what allows single *wh*-questions with a dative *wh*-argument in dative-accusative order), but I have yet to pursue them.

[19] The reason we must leave this as a Japanese-specific (rather than a more language-universal) property is that in German, as discussed in section 4 (and given certain assumptions), Q does seem to be strandable.

[20] As mentioned in chapter 2, this interacts with the discussion of the parallels between *ittai* and numeral quantifiers. Specifically, the ability to "strand" *ittai* (by scrambling the *wh*-word away) may be dependant on the ability to violate (18).

[21] I have been told that at least for some speakers in Japanese, single-pair readings sound ungrammatical (just like what (19) asserts about Sinhala); however, I have not done a large enough survey to verify this. If true, (19) might reflect something more general about the manner in which single-pair readings are accessed or judged. I opted to make the stipulation in (19) in order to match the data my consultants reported to me, although there are probably more subtle things going on.

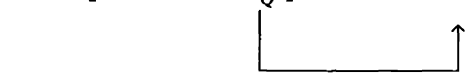
Armed with this much theoretical apparatus, let us now turn to see how they predict the patterns we will observe in the data. We will begin with the Japanese examples in (20). By using a clausal landmark, here the structurally high adverb *kinoo* 'yesterday', we can see that in each question, one of the *wh*-words has been moved. If the lower of the two *wh*-words is moved over *kinoo*, as in (20b), the pair list reading becomes detectably more difficult. The readings are indicated in the gloss by "SP" (single pair) and "PL" (pair-list).

(20) a. **dare**-ga kinoo **nani**-o katta no?
who-NOM yesterday **what**-ACC bought Q
'Who bought what yesterday?' (PL, SP)

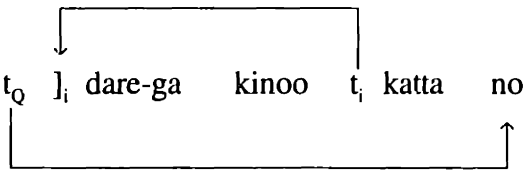
b. **nani**-o_i kinoo **dare**-ga t_i katta no?
what-ACC yesterday **who**-NOM bought Q
'Who bought what yesterday?' (?*PL, SP)
(Shigeru Miyagawa, Keiko Yoshida, Tomoyuki Yoshida, Takako Aikawa, Kazuko Yatsushiro, p.c.)

Here is how the account given above predicts this difference: In both (20a) and (20b), Q originates by *nani*, the structurally lowest *wh*-word, by Q-introduction Antisuperiority. In (20a), illustrated in (21a), Q is launched from where it originates, meaning it has *nani* but not *dare* in its scope; this results in the pair-list reading, by Pair-list Antisuperiority. In (20b), illustrated in (21b), *nani* is scrambled. Because Q cannot be stranded (by (18)) and Q is generated by *nani* (as before, by Q-introduction Antisuperiority), Q must scramble along with *nani* in (20b). In its fronted position, Q then has both *nani* and *dare* in its scope, thus failing to satisfy Pair-list Antisuperiority, and thereby disallowing the pair-list reading.

(21) a. dare-ga kinoo [nani-o t_Q] katta no ? =(20a)



b. [nani-o t_Q]$_i$ dare-ga kinoo t_i katta no ? =(20b)



The next paradigm we will consider is in (22), which shows various permutations of a question with two non-subject *wh*-words.

(22) a. John-ga **dare**-ni **nani**-o ageta no?
John-NOM **who**-DAT **what**-ACC gave Q
'What did John give to who?' (PL, SP)

b. **dare**-ni_i John-ga t_i **nani**-o ageta no?
who-DAT John-NOM **what**-ACC gave Q
'What did John give to who?' (?PL, SP)

c. **nani**-o$_i$ John-ga **dare**-ni t$_i$ ageta no?
what-ACC John-NOM **who**-DAT gave Q
'What did John give to who?' (??PL, SP)

d. **dare**-ni$_i$ **nani**-o$_j$ John-ga t$_i$ t$_j$ ageta no?
who-DAT **what**-ACC John-NOM gave Q
'What did John give to who?' (PL, SP)

e. **nani**-o$_j$ **dare**-ni$_i$ John-ga t$_i$ t$_j$ ageta no?
what-ACC **who**-DAT John-NOM gave Q
'What did John give to who?' (??PL, SP)
(Shigeru Miyagawa, Keiko Yoshida, Tomoyuki Yoshida, p.c.)

In the basic order (22a), the pair-list reading is available. This is predicted by the dative-accusative base order; the pair-list reading is possible here because Q starts on *nani* (by Q-introduction Antisuperiority) and has *nani* but not *dare* in its scope, resulting in the pair-list reading (by Pair-list Antisuperiority). Scrambling *dare* has no effect on this explanation, so (22b) works just like (22a). These cases are illustrated in (23) below.

(23) dare-ni John-ga dare-ni nani-o t$_Q$ ageta no ?
(22b) (22a)

(22c) is different because *nani* is scrambled. The pair-list reading is hard but not impossible in this case. Since the pair-list reading requires that one *wh*-word be in the scope of Q and the other be outside the scope of Q (by Pair-list Antisuperiority), the pair-list reading could only come from a (reverse) accusative-dative base structure in a derivation given in (24) below, parallel to the cases illustrated above. However, the pair-list reading is marginal; this suggests (as mentioned before) that although it is *possible* to base-generate the arguments of a ditransitive in the accusative-dative order, it is a marked option.[22]

=(22c, pair-list reading)

(24) ?? nani-o$_i$ John-ga t$_i$ dare-ni t$_Q$ ageta no ? (DO-IO base order)

The remaining cases, in which both *wh*-words are scrambled over the subject, are basically the same as the ones we have already seen. In (22d), the pair-list reading is available,

[22] Actually, one of the consultants had a contrary intuition, indicating that (22c) and (22e) could still have the pair-list reading. Under the explanation I have given, this means that the accusative-dative base order is more readily accessible for her that for those who had trouble getting the pair-list reading for these cases. However, she also found (26c) and (26e), discussed below, to be fine; these examples do not obviously succumb to the same explanation. At the moment, I have no further suggestions to offer.

based on the normal dative-accusative base order, and in (22e), the pair-list reading is only available based on the (reversed) accusative-dative order. Thus, the pair-list reading in (22e) is just as (in)accessible as in (22c).

Let us briefly consider triple questions, although the judgments appear to be even more shaky here. The questions in (25) are just like the ones in (20) except they contain an additional *wh*-word.

(25) a. **dare**-ga kinoo **dare**-ni **nani**-o ageta no?
who-NOM yesterday **who**-DAT **what**-ACC gave Q
'Who gave what to whom yesterday?' (PL, SP)

b. **dare**-ni$_i$ kinoo **dare**-ga t_i **nani**-o ageta no?
who-DAT yesterday **who**-NOM **what**-ACC gave Q
'Who gave what to whom yesterday?' (PL, SP)

c. **nani**-o$_i$ kinoo **dare**-ga **dare**-ni t_i ageta no?
what-ACC yesterday **who**-NOM **who**-DAT gave Q
'Who gave what to whom yesterday?' (*PL, SP)
(Kazuko Yatsushiro, Takako Aikawa, p.c.)

We see that a "list of triples" (still marked "PL" for consistency) reading is available in the base order (25a), as expected; here, Q is generated low and—since nothing has moved—it remains low, allowing a list reading.[23] The same holds for (25b) as well; we can get the pair-list reading in the (normal) dative-accusative order by base-generating Q by *nani*, which does not move.[24] Incidentally, (25b) also tells us that it is possible to scramble one *wh*-word over another *wh*-word, since *dare-ni* has clearly scrambled over *dare-ga*.

(25c) is slightly more interesting because *nani*, the *wh*-word which is generated with Q (in the unmarked dative-accusative order), is the one which is scrambled. Because Q cannot be stranded (by (18)), Q must scramble with *nani*; this is just like (20b). In its fronted position, Q has all of the *wh*-words in its scope and thus fails to meet the requirement of Pair-list Antisuperiority; only a single triple reading is available in this configuration.

A note: although the data above does not show this, we do predict that the list reading should be marginally available, arising from the reversed (accusative-dative) base order; if Q is generated with *dare-ni* instead of *nani-o*, then (25c) would be parallel to (25b). We saw in (22) that this reversed order is marked and only marginally allows list readings anyway. I do not have an explanation for why the list reading is more inaccessible than predicted in (25c) ("*" vs. "??"), but it is also possible that the difficulty in judging

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[23] I should point out that under the Pair-list Antisuperiority generalization, a pair-list reading could arise either if Q launches from the *lowest wh*-word or if Q launched from the *intermediate wh*-word. When we develop the semantic foundation for the Pair-list Antisuperiority generalization in chapter 6, we will see that the two options should produce slightly *different* lists. We will return to this in chapter 6.

[24] Kazuko Yatsushiro (p.c.) indicated that (25b) might have only a reading where the subject and object can be answered in pairs, while the dative argument must be a single person. I am not sure what to attribute this to (perhaps a specificity requirement on scrambling of this type?), but it does not hurt the argument, since the pair-list reading between the subject and object itself indicates that *-ka* must have launched from below at least one *wh*-word.

these examples overwhelms the contrast. Clearly, more systematic investigation is required here.

The last paradigm of this sort we will consider from Japanese makes use of intervention effects of the kind discussed in chapter 2. In (26), the subject of the question is an intervenor, over which Q-movement cannot proceed. In the first case, (26a), we have a straightforward intervention effect. Q is generated with the lowest *wh*-word, and must move from there to the clause periphery, over the intervenor *John-ka Bill* in subject position. Notice that this is true regardless of which order the objects are base-generated in.

(26) a. ?* [John-**ka** Bill]-ga **dare**-ni **nani**-o ageta no?
John-or Bill-NOM **who**-DAT **what**-ACC gave Q
('What did John or Bill give to who?')

b. ? **dare**-ni$_i$ [John-**ka** Bill]-ga t_i **nani**-o ageta no?
who-DAT John-or Bill-NOM **what**-ACC gave Q
'What did John or Bill give to who?' (*PL, SP)

c. ?? **nani**-o$_i$ [John-**ka** Bill]-ga **dare**-ni t_i ageta no?
what-ACC John-or Bill-NOM **who**-DAT gave Q
'What did John or Bill give to who?' (*PL, SP)

d. **dare**-ni$_i$ **nani**-o$_j$ [John-**ka** Bill]-ga t_i t_j ageta no?
who-DAT **what**-ACC John-or Bill-NOM gave Q
'What did John or Bill give to who?' (PL, SP)

e. ?? **nani**-o$_j$ **dare**-ni$_i$ [John-**ka** Bill]-ga t_i t_j ageta no?
what-ACC **who**-DAT John-or Bill-NOM gave Q
'What did John or Bill give to who?' (??PL, SP)
(Shigeru Miyagawa, Keiko Yoshida, Tomoyuki Yoshida, p.c.)

Although the rest of the examples in (26b–e) have varying levels of grammaticality, they are all better than (26a); in other words, none of (26b–e) exhibit the intervention effect. This tells us is that in each of (26b–e), Q was scrambled over the intervenor. This is consistent with the fact that (26b–c) do not have pair-list readings, since if Q is higher than the intervenor, it has scope over both *wh*-words and thereby fails Pair-list Antisuperiority.

As for what is behind the different levels of grammaticality between (26b–e), I have no convincing explanation. Both (26b) and (26e) require the marked base order (accusative-dative) to get a pair-list reading, explaining a certain degree of marginality; the degree of ill-formedness of (26c) remains mysterious. I must leave any further account of the fine structure of the grammaticality pattern in (26) for future investigation.

Turning now to look at similar paradigms from Sinhala, where we can see the launching site of Q more clearly, we find that they basically correspond to what we have seen in Japanese. The primary difference seems to be that, for the native speaker consultants I asked, questions which would force a single pair reading in Japanese are rated as simply ill-formed in Sinhala (recall the stipulation in (19)). The generalization that seems to cover all of the examples in (27) is that, after any scrambling, Q have only one—not both—*wh*-words in its scope.

The pair (27a–b) replicates the contrast from (3) at the beginning of this chapter. When the *wh*-words are in their base positions, Q can attach only to the lower of them. The same is true if both have been scrambled (together) over the subject, as in (27c–d).

(27) a. Chitra **kaa**-ṭe **mokak də** dunne kiyəla dannəwa də?
Chitra **who**-DAT **what Q** gave-E that know Q
'Do (you) know what Chitra gave to whom?'

b. * Chitra **kaa**-ṭe **də mokak** dunne kiyəla dannəwa də?
Chitra **who**-DAT **Q what** gave-E that know Q
('Do (you) know what Chitra gave to whom?')

c. **kaa**-ṭe **mokak də** Chitra dunne kiyəla dannəwa də?
who-DAT **what Q** Chitra gave-E that know Q
'Do (you) know what Chitra gave to whom?'

d. * **kaa**-ṭe **də mokak** Chitra dunne kiyəla dannəwa də?
who-DAT **Q what** Chitra gave-E that know Q
('Do (you) know what Chitra gave to whom?')
(Kumara Henadeerage, Dileep Chandralal, p.c.)

If one *wh*-word is scrambled over the subject leaving the other behind, below the subject, only the configurations which would yield a pair-list reading (according to Pair-list Antisuperiority) are well-formed (again, by stipulation (19)).[25] Notice that the well-formedness of (28c) leads us to conclude that Sinhala, like Japanese, allows the objects in a ditransitive to be base-generated in accusative-dative order (thereby causing Q to be generated on the dative *wh*-phrase).

(28) a. **kaa**-ṭe Chitra **mokak də** dunne kiyəla dannəwa də?
who-DAT Chitra **what Q** gave-E that know Q
('Do (you) know what Chitra gave to whom?')

b. * **kaa**-ṭe **də** Chitra **mokak** dunne kiyəla dannəwa də?
who-DAT **Q** Chitra **what** gave-E that know Q
('Do (you) know what Chitra gave to whom?')

c. **mokak** Chitra **kaa**-ṭe **də** dunne kiyəla dannəwa də?
what Chitra **who**-DAT **Q** gave-E that know Q
('Do (you) know what Chitra gave to whom?')

d. * **mokak də** Chitra **kaa**-ṭe dunne kiyəla dannəwa də?
what Q Chitra **who**-DAT gave-E that know Q
('Do (you) know what Chitra gave to whom?')
(Kumara Henadeerage, p.c.)

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[25] Dileep Chandralal (p.c.) found even (28a) and (28c) to be unacceptable (as well as (29a), discussed below). The ill-formedness of (28a) seems particularly mysterious to me; I must leave this judgment as an unsolved problem. The ill-formedness of (28c) and (29a) might be accounted for by appealing to the markedness of the (reversed) accusative-dative base order of internal arguments in a ditransitive (as discussed above with regard to Japanese). Kumara Henadeerage (p.c.), who accepted these examples (as reported in the text), indicated that the fronted *wh*-word is "emphasized" in these cases.

Finally, when both *wh*-words are fronted but not in their base order, only the order which would yield a pair-list reading is well-formed (by (19)).[26]

(29) a. ? **mokak** **kaa**-ṭe **də** Chitra dunne kiyəla dannəwa də?
what **who**-DAT **Q** Chitra gave-E that know Q
('Do (you) know what Chitra gave to whom?')

b. * **mokak** **də** **kaa**-ṭe Chitra dunne kiyəla dannəwa də?
what **Q** **who**-DAT Chitra gave-E that know Q
('Do (you) know what Chitra gave to whom?')
(Kumara Henadeerage, p.c.)

To summarize what we have seen in this section, we have looked at multiple-*wh*-questions in both Japanese and Sinhala and seen that the availability of pair-list readings (or in the case of Sinhala, simply the grammatically) follows given a few different generalizations. For some of these generalizations we have independent motivations: (a) the "Pair-list Antisuperiority" generalization, motivated by the semantic account to be given in chapter 6, (b) the availability of two different base orders in ditransitives, argued for by Miyagawa 1997b, and (c) the Q-introduction Antisuperiority generalization, the motivations for which are discussed in chapter 8. For others, we have only the observational generalizations themselves: (a) "No-Q-stranding in Japanese" (18), and (b) "No-single-pair-reading in Sinhala" (19). Of course, we hope that future work will find either independent justification or alternative explanations for these latter two.

4. German and the "Beck effect"

Although it seems fairly far afield, we can find additional evidence from German for the "Antisuperiority generalizations" introduced in the previous section, based on a blocking phenomenon in German noticed by Rizzi (1990), and analyzed in more detail by Beck (1996). German is not, of course, a *wh*-in-situ language (which differentiates it from the other languages we have been looking at). However, it is possible to abstract away from that and still find useful results.

Beck (1996) observed that in *wh*-questions where at least some part of the *wh*-word is left in situ, members of a certain class of quantificational elements cannot intervene between the in situ material and the clause at which the *wh*-word takes scope. To give a concrete example, the negative quantifier *niemand* 'nobody' blocks association of the in-situ *wo* 'where' with the interrogative clause. The contrast in (30) shows that the structure is well-formed when *niemand* is not involved, and the contrast in (31) shows that the structure is well-formed when *niemand* does not intervene.

[26] I have no account for why (29a) was felt to be less good than (28c), since both imply the accusative-dative base order for the two objects.

(30) a. Wen hat Luise **wo** gesehen?
whom has Luise **where** seen
'Where did Luise see whom?'

b. * Wen hat **niemand** **wo** gesehen?
whom has nobody **where** seen
('Where did nobody see whom?') (Beck 1996:3–4)

(31) a. * Wer hat **niemanden** **wo** angetroffen?
who has nobody **where** met
('Who didn't meet anybody where?')

b. Wer hat **wo**$_i$ **niemanden** t_i angetroffen?
who has **where** nobody met
'Who didn't meet anybody where?' (Beck & Kim 1997:340)

Beck's (1996) analysis of these facts starts by supposing (following Huang 1982a) that all *wh*-words are associated with their scope position by movement. Beck's generalization in these terms says that covert movement cannot proceed over negation. Of course, here we are not adopting Huang's (1982a) view of *wh*-movement, but we can assimilate the German facts into the domain of "intervention effects" discussed for Japanese in chapter 2 by stating the generalization as follows:

(32) BECK EFFECT: Q cannot be attracted over a certain set of elements (which includes at least negative items like *niemand* 'nobody')

If (32) is responsible for the ill-formedness of (30b) and (31b), we can use the intervention effect Beck reported to help identify where Q originates in German. (30b) and (31b) suggest that the Q-introduction Antisuperiority generalization holds in German as well; Q must be moving from the lowest *wh*-word (*wo* 'where') to the interrogative clause periphery.

German, being a V2 language, always "topicalizes" some element to the preverbal position (in matrix clauses). There is very little constraint on what is topicalized to this position; essentially any constituent can move there. In *wh*-questions, it is required that a *wh*-phrase move to topic position,[27] but examples like (33) show that it is also possible to topicalize a *wh*-word with Q attached; *was* 'what' can move over *keiner* 'nobody', resulting in a well-formed question. If Q were left behind by topicalization, *keiner* 'nobody' would intervene and yield ill-formedness.[28] Since the example is well-formed, we know that Q must have moved past *keiner* with *was*.

[27] I may be using the term "move" too loosely, if cases of "partial *wh*-movement" (discussed, e.g., by McDaniel 1989) involve base-generation of a *wh*-expletive. However, this question is quite a bit deeper than the issues we will be discussing in this section.

[28] What happens to Q once it is in topic position is underdetermined by the small-scale investigation I have done. If *hat* 'has' is in C° and Q must move to C°, then something additional must be said. Perhaps the interrogative head is higher still than *hat*. Nothing I say here decides the issue.

(33) **was**$_i$ hat **keiner** Luise t_i geziegt?
what has nobody Luise shown
'What did nobody show to Luise?' (Uli Sauerland, p.c.)

There are, however, cases where Q *is* "left behind" when a *wh*-element is topicalized. German appears to allow movement of *less* than the entire *wh*-phrase to SpecCP, so long as a *wh*-word is included. The cases given below (from Beck 1996), are of this type.

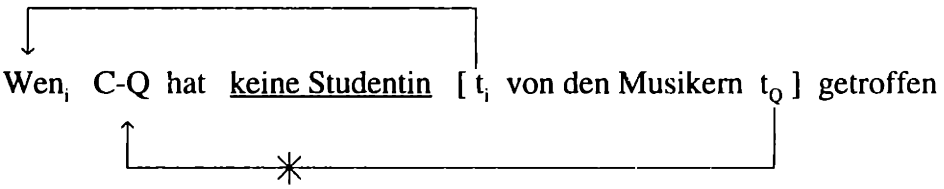
(34) a. Wen hat Luise **alles** gesehen?
whom has Luise **all** seen
'Who-all did Luise see?'

b. * Wen hat **niemand alles** gesehen?
whom has nobody **all** seen
('Who-all did nobody see?') (Beck 1996:4)

(35) a. Wen hat Luise **von den Musikern** getroffen?
whom has Luise **of the musicians** met
'Which of the musicians did Luise meet?'

b. * Wen hat **keine Studentin von den Musikern** getroffen?
whom has no student **of the musicians** met
('Which of the musicians did nobody meet?') (Beck 1996:4)

In order to account for (34) and (35) as intervention effects for Q-movement (in the same way we accounted for intervention effects in Japanese), the examples above must have a structure like that shown below; i.e. (35b) must have a structure roughly like (36). That is, the launching site for Q is outside the entire *wh*-phrase, but a subpart of the *wh*-phrase can be topicalized to SpecCP.



Now, let us reconsider (30), repeated below, which showed us that *niemand* 'nobody' cannot appear to the left of a *wo* 'where' in situ. The example in (37) shows (as (31) did) that scrambling *wo* 'where' to the left of *niemand* solves the problem.

(30) a. Wen hat Luise **wo** gesehen?
whom has Luise **where** seen
'Where did Luise see whom?'

b. * Wen hat **niemand wo** gesehen?
whom has nobody **where** seen
('Where did nobody see whom?') (Beck 1996:3–4)

(37) Wen hat **wo**$_i$ **niemand** t_i gesehen?
whom has **where** nobody seen
'Where did nobody see whom?' (Uli Sauerland, p.c.)

These facts tell us that in (30), Q launches from next to *wo* 'where', hence must cross the subject position, causing an intervention effect in (30b). (37) gives us evidence that Q can scramble with *wo* to a position above *niemand.*

Now compare the paradigm above to that in (38), where instead of moving *wen* 'whom' to SpecCP, we have moved *wo* 'where'. Of course, the base configuration is presumably the same, meaning that (in accordance with Q-introduction Antisuperiority from the previous section) Q is base-generated with *wo* (just like in (30), (37)).

(38) a. Wo hat Luise **wen** gesehen?
where has Luise **whom** seen
'Where did Luise see whom?'

b. * Wo hat **niemand** **wen** gesehen?
where has nobody **whom** seen
'Where did nobody see whom?'

c. * Wo hat **wen**$_i$ **niemand** t_i gesehen?
where has **whom** nobody seen
'Where did nobody see whom?' (Uli Sauerland, p.c.)

(38a) is as good as (30a), showing us that it is possible to topicalize a *wh*-word which was not the structurally highest. Notice now that both (38b–c) are ill-formed, indicating that somehow the movement of *wo* to CP must have left Q behind. Since Q is generated with *wo*, scrambling *wen* over *niemand*, as in (38c) has no particular effect on anything. However, it is worth pointing out that the ill-formedness of (38c) is surprising under Beck's (1996) own analysis, since all of the *wh*-words have been moved overtly out of the scope of the negative quantifier.

Before giving an account of this, let me first show that these facts do not rely on any special properties of *wo* 'where'. We do this by repeating the paradigm except with argument *wh*-phrases *was* 'what' and *wem* 'to whom', as below.[29] The questions in (39) correspond to those in (30a–b) and (37); *wem* (the superior *wh*-word) has been moved to CP leaving *was* in situ. If *keiner* 'nobody' intervenes between *was* in situ and CP, the question is ill-formed (39b), but if *was* is scrambled over *keiner*, the question is fine (39c).[30]

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[29] To judge (39b–c) and (38b–c), it might help to consider the following context: Visiting dignitaries are being shown around a national museum for several hours, but for policy reasons each tour guide only works for an hour; this means that each dignitary gets shown around by a series of tour guides. The museum is so vast, however, that at the end of the day, none of the dignitaries has seen the entire collection, so now we want to find out which dignitaries missed which paintings. For (39a) and (38a), suppose Luise is one of the tour guides, and we just want to know what *she* showed to each of the dignitaries she was responsible for during the day.

[30] Uli Sauerland (p.c.) tells me that *keiner* 'nobody' is more natural here than *niemand* 'nobody' although I believe the paradigm holds for both.

(39) a. Wem hat Luise **was** gezeigt?
who(DAT) has Luise **what** shown
'What did Luise show to whom?'

b. * Wem hat **keiner was** gezeigt?
who(DAT) has nobody **what** shown
'What did nobody show to whom?'

c. Wem hat **was**$_i$ keiner t_i gezeigt?
who(DAT) has what nobody shown
'What did nobody show to whom?'
(Uli Sauerland, Jaemin Rhee, Martin Hackl, p.c.)

The examples in (40) correspond to those in (38); here *was* is moved to CP instead, leaving *wem* in situ. Again, when *keiner* 'nobody' intervenes between the *wh*-in-situ and CP, the question is ill-formed (40b), but here scrambling does not help: (40c) is ill-formed despite the fact that all *wh*-words are hierarchically above *keiner* in the surface form.

(40) a. Was hat Luise **wem** gezeigt?
what has Luise **who**(DAT) shown
'What did Luise show to whom?'

b. * Was hat **keiner wem** gezeigt?
what has nobody **who**(DAT) shown
'What did nobody show to whom?'

c. * Was hat **wem**$_i$ **keiner** t_i gezeigt?
what has **who**(DAT) nobody shown
'What did nobody show to whom?'
(Uli Sauerland, Jaemin Rhee, Martin Hackl, p.c.)

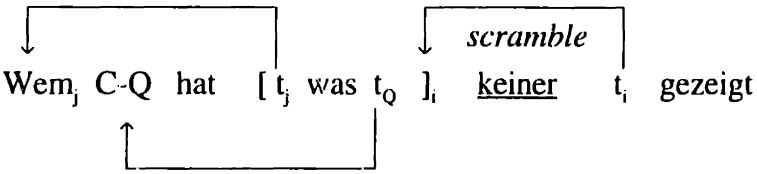
Now, let us hazard an analysis. We will start by considering the movement of a *wh*-word into SpecCP. We saw (e.g., (39a) vs. (40a)) that either of the two *wh*-words can end up in the SpecCP position. However, this can be considered to be a side effect of the availability of scrambling; it is possible to *scramble* a *wh*-word over another, and once their relative hierarchical positions are reversed, the originally lower (now higher) *wh*-word can move into SpecCP without crossing another *wh*-word. This is illustrated below.

(41) a. was$_i$ hat t_i' Luise wem t_i gezeigt?
scramble

b. wem$_i$ hat Luise t_i was gezeigt?

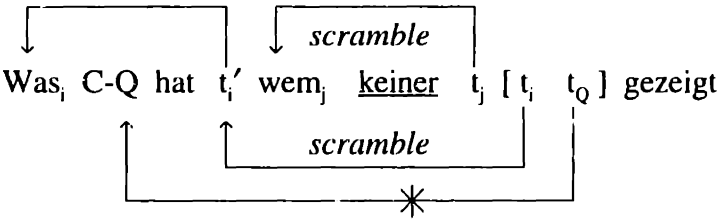
That is to say, German fronting of *wh*-words to SpecCP *does* obey "Superiority" (i.e. only the closest *wh*-word may front), but scrambling need not.[31]

Now, consider the good case, (39c), where the highest *wh*-word (*wem* 'who') is fronted to SpecCP and the lower *wh*-word (*was* 'what') is scrambled over the intervenor *keiner* 'nobody'. Given the discussion immediately above, we know that *wem* must also have scrambled over *keiner* before moving to SpecCP; if that were not so, *was* would have been closer to SpecCP and it would have been fronted (in accordance with Superiority). Thus, the analysis of (39c), shown below in (42), must involve scrambling *both wh*-words *together* before topicalizing the highest. When both are scrambled together, Q comes along, and is therefore higher than the intervenor *keiner*.



(42) Wem$_j$ C-Q hat [t$_j$ was t$_Q$]$_i$ keiner t$_i$ gezeigt

On the other hand, in the ill-formed case (40c), *was* must scramble higher than *wem*, although both are scrambled. Once *was* is structurally higher than *wem*, *was* is eligible to move to SpecCP. Q remains below, causing an intervention effect. This is illustrated in (43).[32]



(43) Was$_i$ C-Q hat t$_i$′ wem$_j$ keiner t$_j$ [t$_i$ t$_Q$] gezeigt

There are several issues raised by the analysis given in (42) and (43), although only sketchy solutions will be proposed here. First, it is crucial that when the *wh*-words scramble together (as in (42)), Q comes along, whereas when the *wh*-words cannot have scrambled together (because their order has been reversed, as in (43)), Q must remain behind.

For the present purposes, we will just state the fact that Q cannot come along in (43) with the generalization in (44). That is, scrambling of a *wh*-word with Q attached can simply never occur to this pre-subject position.

(44) Q CANNOT SCRAMBLE WITH A *WH*-PHRASE IN GERMAN
Q cannot scramble along with a *wh*-phrase (in German).

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[31] Note that we probably cannot appeal to a reversed base-generation order (as we did for Japanese and Sinhala above), since that would not account for the facts involving *wo* 'where'. The paradigm in (30), (37–38) with *wo* is parallel to the cases in (39–40), yet *wo* is neither an indirect nor a direct object, and thus is not (necessarily anyway) subject to having an alternative base order with respect to the direct object.

[32] This is the case that was alluded to in footnote 19 from the last section; Q-stranding is possible in this German example, although Q-stranding seems to be forbidden in Japanese.

What, then, allows the derivation in (42)? Perhaps (42) is a case of remnant scrambling; that is, the two *wh*-words are scrambling together, in order, because the constituent being scrambled is the VP that contains them both in their base positions. This constituent is big enough that (44) does not apply to it (it is after all a VP, not a *wh*-phrase). Let me also mention a couple of further issues that arise from analyzing (42) as involving remnant scrambling. Clearly the scrambled remnant excludes the verb; in fact, according to Müller (1996), remnants which contain the verb *cannot* be scrambled to this position. The implication is that, if the analysis proposed in (42) is tenable, the verb must move out of its base position to a higher position. My speculation is that the scrambled remnant in (42) is the projection below "*v*P" (where "*v*P" is the projection in which the subject is introduced, under the "Split-VP hypothesis" proposed in Bobaljik (1995), Koizumi (1995), and Chomsky (1995)). This projection immediately below *v*P contains the internal arguments, but excludes the subject, and if the verb moves at least as high as *v*°, it will also exclude the verb.

The purpose of this section was to show that the facts Beck (1996) discusses from German can plausibly be analyzed as another instance of the same kind of "intervention effect" that we saw in Japanese in the previous chapter. While the analysis suggested here is certainly not complete, it does give us an idea of how we might proceed with an analysis in the general framework being developed in this thesis.

5. Quantifier/*wh*-syntax I: Catapulting ∀ out of CP

Following up on the discussion in the previous section, there is another observation that Beck (1996) made with respect to the intervention effect in German. She notes that (restating it in our terminology) that *jeder* 'everyone' is disallowed along the path of Q-movement, a generalization which manifests itself by the fact (attributed to Pafel 1991) that (45) has only a distributive reading.

(45) wen hat **jeder** **wo** gesehen?
whom has everyone **where** seen
'Where did everyone see whom?'
(only reading: for each person *x*, who did *x* see where?) (Beck 1996:19)

This follows from the interventional nature of *jeder* 'everyone' under the assumption that on the distributive reading is ejected from the clause entirely, taking a position above CP to quantify into the question as illustrated in (46).[33]

(46) jeder_i [wen hat t_i wo gesehen]

[33] This matches how we will treat such readings in chapter 7 as well.

The representation in (46) does not violate the generalization from (32) (the "Beck effect") because *jeder* has been moved out of the way.

In Japanese, as we have seen in chapter 2, *daremo* 'everyone' is also an intervenor for Q-movement. Consider the question in (47), which is of the type discussed by Hoji (1985).[34] People appear to be divided on the well-formedness of the single answer question, but it appears to be the unanimous opinion that (47) does not have a "distributive" or pair-list reading.[35]

(47) ?? **daremo**-ga **dare**-o aisiteiru no?
everyone-NOM **who**-ACC love Q
'Who does everyone love?'
i. (?*) Taroo-desu.
Taroo-be
'(It is) Taro.'
ii. * John-wa Mary-o, Bill-wa Sue-o, ... desu.
John-top Mary-acc, Bill-top Sue-acc be
('(It is) John, Mary; Bill, Sue; ...')

However, as Kurata (1991) and Abe (1993) observe, such questions improve (on the pair-list reading) when they are embedded.[36]

(48) a. [**daremo**-ni$_i$ **dare**-ga t_i kisusita ka] yoku sitteiru (koto)
everyone-DAT **who**-NOM kissed Q well know fact
'(I/we) know well who kissed everyone' (PL, single answer)
(Abe 1993:232)

b. ?? Mary-wa [**daremo**-ga **dare**-o suisensita ka] sitteiru.
Mary-TOP **everyone**-NOM **who**-ACC recommended Q knows
'Mary knows who everyone recommended.' (Kurata 1991:33)

If this is correct, it suggests that the presence of a CP when such questions are embedded allows *daremo* 'everyone' to take wide enough scope to yield the pair-list reading.

The reason that Japanese does not allow *daremo* to QR out of a matrix CP is not clear. For now, it will have to simply be left as a stipulated difference between German (which does allow this movement, e.g., in (45)) and Japanese (which does not, as we saw in (47)).[37]

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[34] Here, we will ignore the availability of the functional reading; we will return to discuss this in more detail in chapter 6. To briefly mention the fact, Miyagawa (1997a) has pointed out that (47) is grammatical if interpreted as requesting a functional answer like '*his mother*'.

[35] David Pesetsky (p.c.) observed that the English question *Who does each person like?* seems to have the same readings as (47) in Japanese. This might suggest that *each person* is an intervenor in English (like *dono hito-mo* 'every person' in Japanese, and unlike *every person* in English). This could be a fruitful area for future exploration. Also, *Who did each person see where?* also seems to strongly favor a distributive reading, like the German (45).

[36] Kurata (1991) cites Aki (1988) as making the same observation. See also Abe (1993:274, fn. 27) for brief comment.

[37] There are various complications. The most obvious move to make might be to suggest that Japanese matrix clauses lack ∀P (where "∀P" is the phrase to which *everyone* must adjoin when *everyone* moves out of the clause). As part of the complementizer system, embedded clauses have it. We could then say that

(...*continues*) ➡

The next section will continue the discussion by considering the behavior of *wh*-questions with 'everyone' in Chinese.

6. Q-movement in Chinese

Chinese is a famous example of a *wh*-in-situ language, and has played a significant role in the literature on the typology of question formation. Although Chinese, like Japanese, generally leaves its *wh*-words in their argument position, the properties of *wh*-questions in the two languages differ in certain nontrivial respects. In this section and the next, we will take a very brief look at question formation in Chinese to see how it fits into the larger picture we have been developing. The discussion here is based largely on the discussion in Aoun & Li (1993a,b).

Beginning with the basics, observe that the word order in Chinese does not change between a declarative (49a) and the *wh*-question (49b). We take this as an indication of the (elsewhere well-established) fact that Chinese is a *wh*-in-situ language. Notice also that the *wh*-question can, but need not, be marked with the question particle *ne*.

(49) a. ta xihuan ni.
he likes you
'He likes you.' (Huang 1982a:277)

b. ta xihuan **shei** (**ne**)?
he likes **who Q**
'Who does he like?' (Hooi Ling Soh, p.c.)

As we saw for Japanese, it is possible in Chinese to have a *wh*-word inside an island. The examples below show *wh*-words inside a sentential subject (50a), a complex noun phrase (50b), and an adjunct (50c).

(50) a. [**shei** lai] zui hao?
who come most good
'Who is the *x* such that [*x* come] is the best?'

b. ni xihuan [**shei** xie de shu]?
you like **who** write DE book
'Who do you like the book that *t* wrote?'

(continued...)

both matrix and embedded clauses have ∀P in German. The problem is that on a single-cycle syntax (cf. the discussion of Japanese *-koso* in chapter 4), the head which attracts Q must be the same as the head of the projection to which *everyone* adjoins in order to allow *everyone* to move *before* Q is attracted. Clearly Japanese does not lack this head, since Q moves overtly. An alternative, and perhaps more promising, possibility is to try to locate the difference in the V2 movement in German to C; perhaps something about having the verbal element in C might allow the movement of *everyone* in German whereas it does not in Japanese. However, this too has complications; embedded questions in German do not show V2 effects, yet they presumably allow pair-list readings anyway. Because of these complications, I have opted to leave it as a stipulation to be explained at some other time.

c. ta [yinwei ni shuo **shenme** hua] hen shengqi?
he because you say **what** word very angry
'What was he angry because you said *t*?' (Aoun & Li 1993a:203)

The facts above indicate that the *wh*-word can remain inside the island and still be properly interpreted. Aoun & Li (1993a) propose that Chinese has a question operator which is generated separately from the *wh*-phrase, and which can be generated outside the islands in cases like those given above. In particular, they propose that the question operator can be base-generated at the clause periphery, thereby avoiding any need for movement at all (this would be the equivalent of base generating Japanese *-ka* or Sinhala *də* at the clause periphery).

Since we have built up a fairly intricate analysis of the Q particle, we can test for this by looking at whether multiple questions can receive pair-list readings. Recall that if Q launches from above both *wh*-words, we predict a single pair reading, whereas if Q launches from below one of the *wh*-words, we expect a pair-list reading (by the Pair-list Antisuperiority generalization). As we see in (51), a pair-list reading is possible, indicating that Q does *not* originate at the clause periphery, but rather originates down inside the clause (specifically, below *shei* 'who'), much like in Japanese.

(51) wo xiang-zhidao **shei** mai-le **shenme**.
I want.to.know **who** buy-ASP **what**
'I want to know who bought what.' (PL ok) (Hooi Ling Soh, p.c.)

We can fortify this conclusion by noting that when both *wh*-words are inside an island, as in (52), no pair list reading is available. This follows straightforwardly; Q could not have originated below any of the *wh*-words because if it had, Q would then have had to move out of an island to reach the clause periphery.

(52) ta keneng hui [yinwei Li jiao **shei** mai **shenme**] shengqi ne?
he maybe will because Li ask **who** buy **what** angry Q
'He might get angry because Li asks who to buy what?' (SP, *PL)
(Hooi Ling Soh, p.c.)

Recall also that we saw this same effect in Japanese, in example (12) of section 2.[38]

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[38] In fact, it appears to be difficult to get a pair-list reading when even one of the *wh*-words is within an island in both Chinese (i) and Japanese (ii). The English example (iii), seems to be able to get a pair-list reading, although perhaps it is somewhat inaccessible; the context in (iv) suggested by Noam Chomsky (p.c.) seems to bring out a pair-list reading pretty clearly.

(i) **shei** keneng hui [yinwei Li jiao ta mai **shenme**] shengqi ne?
who maybe will because Li ask him buy **what** angry Q
'Who might get angry because Li asks him to buy what?' (*PL) (Hooi Ling Soh, p.c.)

(ii) **dare**-ga [John-ga **nani**-o katta toki-ni] okotta no?
who-NOM John-NOM **what**-ACC bought when got.angry Q
'Who got angry when John bought what?' (SP, *PL)
(Shigeru Miyagawa, Kazuko Yatsushiro, Takako Aikawa, p.c.)

(iii) **Who** left [after Mary bought **what**] ? (SP, ?PL)

(iv) I know that every time Mary bought something, someone got up and left.
But I'm not sure *who left after Mary bought what.*

(...*continues*) ➡

7. Quantifier/*wh*-syntax II: Chinese

Let us now turn to look at the interaction of quantifiers and *wh*-words in Chinese. The discussion in this section draws heavily on Aoun & Li (1993a, 1993b).

In cases like (53a), where the *wh*-word is a subject and the universal quantifier is an object, only a single answer is allowed; the pair-list reading is excluded. However, in (53b), where the quantifier is a subject and the *wh*-word is an object, the pair-list reading is again allowed.

(53) a. **Shei** kandaole **meige dongxi**?
who saw **every thing**
'Who saw everything?' (unambiguously single answer)

b. **Meigeren** dou kandaole **shenme dongxi**?
everyone all saw **what thing**
'What did everyone see?' (ambiguous) (Aoun & Li 1993a:227)

With Aoun & Li, we will assume that the list answer that (53b) can have is due to a structure in which *meigeren* 'everyone' takes scope over the question. However, contra Aoun & Li, but in line with the discussion from section 5, we will assume that this comes about by scoping *meigeren* all the way out of the clause. The idea is illustrated in (54). Notice that we can tell by the fact that (53b) is ambiguous that Chinese *meigeren* (unlike Japanese *daremo* and German *jeder*) is not an intervenor for Q-movement.[39]

(54) a. Q ... meigeren ... shenme ... ((53b), single answer)

b. meigeren$_i$ Q ... t_i ... shenme ... ((53b), list answer)

Aoun & Li argue for an alternative view under which the pair-list reading comes from movement of Q; when Q moves over *meigeren*, their system allows an interpretation where *meigeren* takes scope over the question by virtue of taking scope over the trace of Q.

Aoun & Li use examples with islands to substantiate their claim, but their examples are equally compatible with the proposal made here. The examples they give have the structures shown below, which I have re-interpreted in our terms. In (55), the quantifier and *wh*-word are both inside the island, which keeps the quantifier from being able to

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(continued...)
I am not sure if similar contexts could bring out pair-list readings in Chinese and Japanese as well. Note also that the result reported in (ii) seems to be at odds with the judgment reported back in (13). The difficulty of getting pair-list readings with a *wh*-word contained in an island might be in some way attributable to the fact that we must make use of "flexible functional application" to evaluate the semantics internal to the island; see the discussion in chapters 5–6. The details of such an account have yet to be worked out, however.

[39] However, English *everyone* and Japanese *minna* 'everyone' also seem not to be intervenors, so this property of Chinese *meigeren* 'everyone' is not necessarily surprising.

scope out over the question. The prediction is that only the single answer is possible. which is true of the actual Chinese examples in (56).

(55) a. Q ... NP ... [$_{island}$ ... QP ... shenme ...] ((56), single answer)

b. * QP_i ... Q ... NP ... [$_{island}$ ... t_i ... shenme ...] ((56), list answer)

(56) a. ta keneng hui [yinwei Li jiao **meigeren** mai **shenme**] shengqi ne?
he maybe will because Li ask **everyone** buy **what** angry Q
'What might he get angry because Li asks everyone to buy *t*?'
(single answer only)

b. ta keneng hui kandao [xiwang **meigeren** mai **shenme** de ren] ne?
he maybe will see hope **everyone** buy **what** DE man Q
'What might he see the man that hopes everyone will buy *t*?'
(single answer only)
(Aoun & Li 1993a:228)

In (57), the quantifier is outside the island, which once again allows it to scope out of the question. The prediction is that these should be ambiguous, like (53b) was, and they are, as shown by (58).

(57) a. Q ... QP... [$_{island}$ ... NP ... shenme ...] ((58), single answer)

b. QP_i ... Q ... t_i ... [$_{island}$ ... NP ... shenme ...] ((58), list answer)

(58) a. **meigeren** keneng hui [yinwei Li jiao ta mai **shenme**] shengqi ne?
everyone maybe will because Li ask him buy **what** angry Q
'What might everyone get angry because Li asks him to buy *t*?'
(ambiguous)

b. **meigeren** keneng hui kandao [xiwang Zhangsan mai **shenme** de ren]
everyone maybe will see hope Zhangsan buy **what** DE man
ne?
Q
'What might everyone see the man that hopes Zhangsan will buy *t*?'
(ambiguous)
(Aoun & Li 1993a:229)

What this section showed us is primarily that Chinese fits into the system we have been developing, under the assumption that the pair-list reading arises from movement of the universal quantifier out of the question.[40]

[40] I have *not* provided any explanation for why (53a) is unambiguous, however; something must prevent *meigeren* 'everyone' from scoping out of the clause in cases like these, but I must leave this as an open question for now. This problem is not specific to the case of Chinese; because on our analysis pair-list

(...continues) ➡

8. Additional *wh*-effects

Watanabe (1992a) noticed that questions which require a *wh*-word to take scope out of a *wh*-island are degraded, but can be improved by adding an additional *wh*-word outside of the island. In this section, we will see how this pattern of data can be used to support the general approach we have been taking.

In the basic case, (59a) is degraded because it requires a *wh*-word to take scope outside of an interrogative clause containing it. The addition of a *wh*-word outside the interrogative clause improves the question, as (59b,c) show. It is crucial that the additional *wh*-word be outside the island, however, as we can see by the persistent ill-formedness of (59d).[41]

(59) a. ?? John-wa [Mary-ga **nani**-o katta **kadooka**] Tom-ni
John-TOP Mary-NOM **what**-ACC bought **whether** Tom-DAT
tazuneta **no**?
asked **Q**
('What did John ask Tom whether Mary bought?')

b. John-wa [Mary-ga **nani**-o katta **kadooka**] **dare**-ni
John-TOP Mary-NOM **what**-ACC bought **whether** **who**-DAT
tazuneta **no**?
asked **Q**
'Who did John ask whether Mary bought what?'

c. ? John-wa **dare**-ni [Mary-ga **nani**-o katta **kadooka**]
John-TOP **who**-DAT Mary-NOM **what**-ACC bought **whether**
tazuneta **no**?
asked **Q**
'Who did John ask whether Mary bought what?'

d. ?? John-wa [**dare**-ga **nani**-o katta **kadooka**] Tom-ni
John-TOP **who**-NOM **what**-ACC bought **whether** Tom-DAT
tazuneta **no**?
asked **Q**
('What did John ask Tom whether who bought?') (Watanabe 1992a:270)

(continued ..)
readings do not arise from a binding relation between *everyone* and the *wh*-word, it is not obvious how to prohibit *everyone* from moving out of the clause over a *wh*-word. This is clearly an important point that a more complete account will have to address.

[41] When I have discussed these "saving" examples with native speaker consultants, it has been remarked upon by several people that even when the question is "saved" grammatically, it can only have a single-pair (or single-triple, etc.) type of reading. However, this may be just a further effect of the tendency (pointed out in footnote 38) that a *wh*-word inside an island can participate in pair-list readings only with difficulty, if at all.

The judgments are subtle in this paradigm, particularly with respect to the relative status of (59c).[42] In general, however, these "additional-*wh*" cases are best when the additional *wh*-word does not c-command the embedded question clause, as in (59b).

Watanabe (1992a) accounted for these facts by proposing that exactly one phonologically null operator moves from a position marked by one of the *wh*-words to its scope CP projection. The reason that (59a) is degraded is that this null operator needs to escape an interrogative clause, while in (59b–c), this null operator originates outside the island (by the external *wh*-word) and can therefore move without crossing the island boundary.

The account we are developing in this dissertation is founded on the same basic intuition as Watanabe's account, except that instead of an invisible operator moving, it is *-ka* that is moving. The path traversed by *-ka* on our account (from the "launching site" to the clause periphery) is essentially the same as the path traversed by Watanabe's empty operator, and so our explanation remains the same as his, at least in spirit. The problem with crossing *kadooka* at the interrogative clause boundary is that *kadooka* constitutes an intervening instance of *-ka*, like the cases examined at length in the previous chapter.

Although I do not have a full analysis for the examples in (59) at the moment, let me comment on them briefly. Recall from section 3 that Q starts by the hierarchically lowest *wh*-word (Q-introduction Antisuperiority), and that in ditransitives (following Miyagawa 1997b), it is possible to base-generate the objects either in (normal) dative-accusative or (reversed) accusative-dative order. Let us suppose that this option is also available when a clausal complement is in the direct object position; (59b), then, might arise from a (reversed) accusative-dative base order in which *dare-ni* 'to whom' is the lowest *wh*-word. Being the lowest *wh*-word, *dare-ni* is the *wh*-word with which Q is base-generated. Q then launches from there to the clause periphery, never having to cross *kadooka* (from inside).[43] In (59c), the surface order of the internal arguments is reversed. However, if the *kadooka*-clause is hierarchically lowest (which it would be if the base-order matched the surface order), then Q should be base-generated by the *wh*-word inside the *kadooka*-clause, triggering an intervention violation when Q moves over *kadooka* to reach the matrix clause periphery. Instead, the grammatical version of the surface string in (59c) must also be derived from the base order where *dare-ni* is the structurally lowest argument (like (59b)), meaning that the observed surface order arises from scrambling *dare-ni* over the *kadooka*-clause. The marginality of this example may just come from a parsing preference to match the surface order of the internal arguments with their base order; because (59c) is a *possible* base order but yet could nevertheless only be derived by

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[42] Maki (1995:51) rates it as good, on a par with (59b), while Watanabe (1992a:271) rates it as bad, on a par with (59a). Richards (1997:73) indicates that his consultants found (59c) to have a status somewhere between that of (59a) and (59b).

[43] Notice that Q can cross <u>above</u> *kadooka*; that is, a *kadooka* clause is not an intervenor (like, e.g., *John-ka Bill* 'John or Bill') to movement of Q across it. However, *kadooka* <u>is</u> an intervenor for movement of Q from <u>inside</u> the clause with which it is associated. This would follow if *kadooka* is actually slightly embedded in the complement clause; e.g., *kadooka* appears in a projection *below* CP. Cf. Sinhala (i), repeated from chapter 2 and to which we return in chapter 4. Notice that *dənæddə* appears below *kiyəla*.

(i) ? Ranjit [Chitra **monəwa** kieuwa **də-næddə** kiyəla] **də** danne?
Ranjit Chitra **what** read **whether** that **Q** know-**E**
'Ranjit knows whether Chitra read what?'
(Kishimoto 1997:33,40, Dileep Chandralal, p.c.)

scrambling of the *other* base order, we get a certain marginality. Of course, this account is still primarily speculative.[44]

The details of (59b–c) aside, the primary point of interest is that the additional *wh*-word outside the *wh*-island provides an alternative launching site for *-ka* and in so doing allows for a derivation in which *-ka* need not cross the intervenor *kadooka*.

Moreover, if this view of the additional-*wh* effect is correct, we expect it to provide the same sort of amelioration for other "intervention effects" as well. Recall that in chapter 2, we observed that questions in Japanese become degraded when a *wh*-word is preceded by words like *dare-mo* 'everyone' and *dare-ka* 'someone'. We attributed this effect to the fact that for *-ka* to reach the clause periphery it would need to cross either *-ka* or *-mo*. The account given for (59) also predicts that there should be an "additional-*wh*" effect for these "crossing" problems as well. Specifically, a sentence which was ruled out because *-ka* would have to cross a *-ka* or a *-mo* on its way to the clause periphery should be "saved" by the addition of a higher *wh*-word. The logic is the same as for *wh*-islands as discussed above; the addition of a *wh*-word outside the offending intervenor allows *-ka* to move from the higher position and avoid crossing the intervenor.

This prediction is in fact borne out, as the examples given below show. (60a) shows that the generalization that *hotondo dono hito-mo* 'almost everyone' cannot precede a *wh*-word holds in embedded clauses, and the contrast with (60b) shows that when a *wh*-word is added to the matrix clause the sentence improves. Parallel facts in (61) show that the same holds for interactions between *-ka* and *-sika* 'only$_{NPI}$' as well.

(60) a. ?* John-wa [hotondo dono hito-**mo** **nani**-o katta to] Tom-ni
John-TOP almost which person-MO **what**-ACC bought that Tom-DAT
itta **no**?
said **Q**
('What did John tell Tom that almost everyone bought?')

b. ? John-wa [hotondo dono hito-**mo** **nani**-o katta to] **dare**-ni
John-TOP almost which person-MO **what**-ACC bought that **who**-DAT
itta **no**?
said **Q**
'Who did John tell that almost everyone bought what?'

c. ? John-wa **dare**-ni [hotondo dono hito-**mo** **nani**-o katta to]
John-TOP **who**-DAT almost which person-MO **what**-ACC bought that
itta **no**?
said **Q**
'Who did John tell that everyone bought what?' (Shigeru Miyagawa, p.c.)

(61) a. ?* John-wa [Mary-si**ka** **nani**-o yoma-nai to] Tom-ni itta **no**?
John-TOP Mary-only$_{NPI}$ **what**-ACC read-NEG that Tom-DAT said **Q**
('What did John tell Tom that only Mary read?')

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[44] This speculative account has trouble accounting for examples where the "saving *wh*-word" is a subject (since the subject presumably cannot be *base*-generated lower than a clausal argument). Clearly, there is more work to be done, but I have nothing more insightful to offer at this time.

b. John-wa [Mary-si**ka** **nani**-o yoma-nai to] **dare**-ni itta **no**?
John-TOP Mary-only$_{NPI}$ **what**-ACC read-NEG that **who**-DAT said **Q**
'Who did John tell that only Mary read what?' (Tanaka 1997a:165–7)

These facts are striking. We saw earlier that the addition of a *wh*-phrase to the matrix clause outside a *wh*-island allowed a *wh*-phrase internal to the *wh*-island to take matrix scope. Under both Watanabe's approach and our approach, this is because there is exactly one movement relation happening overtly in Japanese, and when this movement does not cross an intervenor like *kadooka*, all is well. What (60) and (61) tell us is that a preceding *-mo* or *-ka* form barriers to Q-movement of the same type as a *wh*-island, since the effects are obviated under the same conditions (namely, in the presence of a structurally higher *wh*-word). Any approach to these facts will need to account for this. Given this, the *-ka*-movement approach we are developing in this chapter seems to be the simplest kind of explanation possible; the island effect is a simple intervention effect due to the fact that the *-ka* found at the clause periphery must move there overtly from a position adjacent to one of the clause-internal *wh*-words.

Based on our previously outlined analysis of *ittai* as an indicator of the launching site of *-ka*, we also predict that with judicious placement of *ittai* we can bring *back* the intervention effects even in the face of an additional *wh*-word.[45] This is in fact the case. We see that in (62a), where *ittai* is on the "saving" *wh*-word, outside the intervenor *hotondo dono hito-mo* 'almost everyone' the intervention effect is alleviated (as in the cases we saw above, e.g., (60b)). In (62b), however, where *ittai* is on the *wh*-word below the intervenor, the additional *wh*-word does not improve matters, and the sentence is ill-formed again.

(62) a. ?(?) John-wa [hotondo dono hito-**mo** **nanbun**-o eranda to]
John-TOP almost which person-MO **what.number**-ACC chose that
ittai **dare**-ni itta **no**?
ittai **who**-DAT said **Q**
'Who (in the world) did John tell that almost everyone chose what number?'

b. * John-wa [hotondo dono hito-**mo** **ittai** **nanbun**-o eranda to]
John-TOP almost which person-MO **ittai** **what.number**-ACC chose that
dare-ni itta **no**?
who-DAT said **Q**
('Who did John tell that almost everyone chose
what (in the world) number?')
(Shigeru Miyagawa, p.c.)

There is another prediction in this connection which is made by the system we are developing. The reason that the additional *wh*-word can "rescue" intervention violations is that it allows *-ka* to launch from a position outside the intervenor (much in the same way embedding intervention violations inside islands "rescues" them, as we saw in chapter 2). Thus, since *-ka* launches from outside an island containing a *wh*-word, embedding the "saving *wh*-word" inside an island should not prevent it from "rescuing" an intervention violation. The paradigm in (63) shows that this is true.

[45] Thanks to Norvin Richards (p.c.) for pointing out this prediction to me.

(63) a. ?? John-wa [Mary-ga **nani**-o katta **kadooka**]
John-TOP Mary-NOM **what**-ACC bought **whether**
[Tokyo-ni itta hito]-ni tazuneta **no**?
Tokyo-DAT went man-DAT asked **Q**
('What did John ask the man who went to Tokyo whether Mary bought?')

b. John-wa [Mary-ga **nani**-o katta **kadooka**]
John-TOP Mary-NOM **what**-ACC bought **whether**
[**doko**-ni itta hito]-ni tazuneta **no**?
where-DAT went man-DAT asked **Q**
'Where did John ask the man who went *t* whether Mary bought what?'

c. John-wa [**doko**-ni itta hito]-ni
John-top **where**-DAT went man-DAT
[Mary-ga **nani**-o katta **kadooka**] tazuneta **no**?
Mary-NOM **what**-ACC bought **whether** asked **Q**
'Where did John ask the man who went *t* whether Mary bought what?'
(Shigeru Miyagawa, p.c.)

9. Chapter three summary

In this chapter, we continued the investigation started in chapter 2. Knowing that there is a Q which moves from a clause-internal position to a clause-peripheral position in questions, we went on to consider what happens in questions that have more than one *wh*-word, as well as questions which involve quantifiers like *everyone*. Since in Japanese, there is only one *-ka* (Q) which surfaces, even in multiple questions, we are faced with the question of where *-ka* originates.

The relevant data was surprisingly murky but it seemed to point roughly toward the following two generalizations.

(14) PAIR-LIST ANTISUPERIORITY GENERALIZATION
A multiple-*wh*-question gets a pair-list reading when
not all *wh*-words are in the scope of Q

(15) Q-INTRODUCTION ANTISUPERIORITY GENERALIZATION
The base position of Q is as low in the tree as possible;
Q starts close to the lowest *wh*-word.

According to (14), the pair-list reading of a multiple-*wh*-question correlates with a launching site for Q that has at least one *wh*-words outside of its scope (a result which will follow from the semantic proposals in chapter 6). According to (15), the base position of Q is close to the hierarchically lowest *wh*-word; thus, in a question with both a *wh*-subject and a *wh*-object, Q will enter the derivation by the *wh*-object. This generalization in (15) will be discussed and refined further in chapter 8.

Based on the generalizations above in conjunction with some other assumptions, we were able to derive the pattern of readings and grammaticality for multiple questions in Japanese and Sinhala, as well as for a small sample of questions in Chinese. We also looked at an intervention effect in German that has the same basic character as the

intervention effects we saw in Japanese in the last chapter, and sketched an analysis to capture the facts. As part of these analyses, we adopted the conclusion from Miyagawa (1997b) that in ditransitives it is possible for the internal arguments to be generated in either relative order (which, as we saw, have a markedness relation between them, dative-accusative being the unmarked option and accusative-dative the marked option). We also needed to assume certain generalizations for which we do not currently have independent motivation; these are clearly places where future research is needed. These were "No Q-stranding in Japanese" (18), "No-single-pair readings in Sinhala" (19), and "Q cannot scramble with a *wh*-phrase in German" (44).

We then turned from multiple questions to another type of complex questions, namely questions which involve quantifiers, of the type exemplified by the English question *What did everyone buy?*. In part following Beck's (1996) discussion of German, we concluded (a) that *jeder* 'everyone' in German, like *daremo* 'everyone' in Japanese, is an intervenor for Q movement, and (b) that on the pair-list reading of questions like *What did everyone buy?*, the quantifier has moved to a position outside the interrogative clause (the analysis being roughly, *for everyone x, what did x buy?*). This analysis matches the semantic analysis we will provide for such questions in chapter 7. Part of the evidence we reviewed in support of this view included the interaction of pair-list readings with islands in Chinese, which showed that if *meigeren* 'everyone' is inside an island, no pair-list reading is possible. The explanation we gave was simply that a pair-list reading requires the quantifier to move to a position outside of the interrogative CP, which is impossible if the quantifier is trapped inside an island. It was pointed out (see footnote 40) that a complete account will need to further constrain this quantifier movement from crossing *wh*-words (in order to account for the nonambiguity of *Who bought everything?*), but this is left as a problem for future study.

The last set of data we considered in this chapter were the "additional *wh*-effects" in Japanese described by Watanabe (1992a). These are cases where intervention effects are alleviated by adding another *wh*-word from (near) which Q can be launched. These cases have the same sort of character as the cases was saw in chapter 2, where embedding an intervention effect inside an island improved an otherwise ill-formed sentence.

Chapter 4 Some remaining syntactic issues

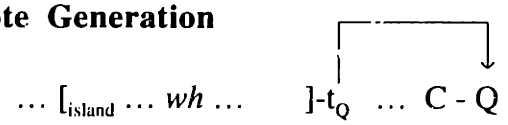
This chapter discusses various issues built on the conclusions of the previous chapters. We start with a pressing question about the "launching site" of Q. In the previous chapters, we have seen evidence for movement of the 'Q' particle (*-ka* in Japanese, *də* in Sinhala, *-GA* in Okinawan, etc.) from a clause-internal position to a clause peripheral position in questions. Of particular interest is the fact discussed in chapter 2 that when a *wh*-word is contained inside an island, Q "launches" to the clause periphery from a position outside the island. The first question we address in this chapter is whether this "launching site" of Q is the same as the *base position* of Q.

In the second section, we review (briefly) a well-known alternative account ("LF pied piping") to the phenomena under discussion, and arguments for and against that alternative view. After that, we turn to look more closely at a focus construction in Japanese involving the suffix *-koso*, which turns out to have interesting implications for the structure of the syntactic derivation. The fourth section contains a brief discussion of differences between *wh*-islands in Japanese and Sinhala, and the fifth section provides a tiny sketch of an analysis of *wh*-questions in Malay.

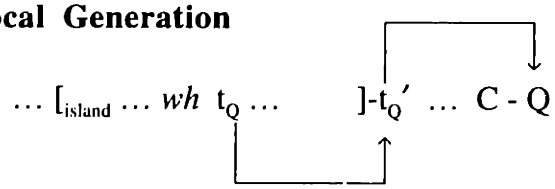
1. Remote vs. Local Generation of Q

The question of whether the base position of Q and the launching site of Q are the same primarily arises where a *wh*-word is contained within an island, so we will focus on this configuration. There are two possible resolutions of this issue. The first possibility (*Remote Generation*) is that Q is base-generated *at* the launching site. The second possibility (*Local Generation*) is that Q is always base-generated next to the *wh*-word, even when the *wh*-word is inside an island, and it *moves* to the launching site.[1]

(1) a. **Remote Generation** (*to be rejected*)



b. **Local Generation** (*to be adopted*)



[1] Of course, there exist questions with Q and no *wh*-words; they are yes-no questions (as we have seen both in Sinhala and in Japanese). I will systematically disregard these in this chapter. Let me mention, thought, that in such questions, Q appears to mark a position of focus, so we can probably suppose that Q is base-generated next to the *focus* in yes-no questions.

The first possibility, Remote Generation, leaves open a difficult question: What principles govern the position in which Q can be base-generated? Observationally, Q appears to be launched from next to a *wh*-word except when the *wh*-word is inside an island, in which case it is launched from just outside the island. To adopt Remote Generation, we would need to say that Q is generated by the *wh*-word, *except* when this results in a configuration in which Q is separated from the interrogative clause periphery by an island. But what prevents Q from being generated outside an island that doesn't contain a *wh*-word? Does the derivation (which we assume proceeds bottom-to-top through the tree) require "look-ahead" to know not to base-generate Q inside an island? Somehow, a Remote Generation view must ensure that the observed generalizations are derivable.

The second possibility, Local Generation, does not have this problem. Under Local Generation, Q can *only* be base generated as a sister to a *wh*-word. If this position turns out to be inside an island, Q will move to the launching site, at the edge of the island, before moving on to the clause periphery.

There are conceptual reasons for and against each of the two possibilities in (1), but it turns out that we can find *empirical* evidence that forces us to Local Generation. To set the scene, recall the pattern shown schematically in (2), taken from chapter 2.[2]

(2)

a.	?* ...	...	Intervenor ... *wh* t_{ka}			... -ka ?
b.	... $[_{island}$	...	Intervenor ... *wh*	...]	t_{ka}	... -ka ?
c.	... $[_{island}$	... wh_i ...	Intervenor ... t_i	...]	t_{ka}	... -ka ?

The first case (2a) shows that in Japanese, a *wh*-word cannot be below an intervenor (like *John-ka Bill* 'John or Bill') because in this configuration, *-ka* must cross the intervenor on its way to the clause periphery. In (2), "t_{ka}" represents the "launching site" of *-ka*. What we see in (2b–c) is that when the structure from (2a) is embedded inside an island, the question becomes well-formed. The intervention effect disappears because the launching site of *-ka* is outside the island; *-ka* no longer crosses the intervenor on its way to the clause periphery.

In the context of Local Generation, the paradigm above in (2) tells us that the movement which takes *-ka* from its base position to the launching site is not sensitive to intervention effects; that is, such movement can cross intervenors freely.

The actual examples schematized by (2) are given in (3) below.

(3) a. ?* [John-**ka** Bill]-ga **nani**-o katta **no**?
John-or Bill-NOM **what**-ACC bought **Q**
('What did John or Bill buy?')

b. Mary-wa [John-**ka** Bill]-ga **nani**-o katta ato de] dekaketa **no**?
Mary-TOP John-or Bill-NOM **what**-ACC bought after left **Q**
'Mary left after John or Bill bought what?'

[2] I repeat the caveat given in chapter 2: although (2) holds for the majority of speakers I asked, more than one person did not find (2b) to improve relative to (2a). I only account for the paradigm as given in (2); I do not have an explanation for the judgment variation.

c. Mary-wa [**nani**-o_i [John-**ka** Bill]-ga t_i katta ato de] dekaketa **no**?
Mary-TOP **what**-ACC John-or Bill-NOM bought after left **Q**
'Mary left after John or Bill bought what?'
(Shigeru Miyagawa, Kazuko Yatsushiro, Junko Shimoyama, p.c.)

So, the first point to remember (as we work toward the presentation of empirical evidence for Local Generation) is that movement of Q from its base position to its launching site under Local Generation is free to cross intervenors. Note that at this point, Local Generation seems at a disadvantage; Remote Generalization would predict (2b–c) straightforwardly, since no movement *occurs* across an intervenor.

The second point concerns successive-cyclic movement of *-ka*, based on the discussion of *ittai* from chapter 2. We saw that *ittai* shares many properties with floating numeral quantifiers, but there is one place where their behaviors appear to diverge: While numeral quantifiers are unable to scramble out of their own clause, *ittai* seems able to appear in any clause between (and including) the clause containing the *wh*-word and the clause in which *-ka* eventually appears. It was proposed that the parallel between *ittai* and numeral quantifiers can be maintained if we suppose that *ittai* can be generated as a modifier at any of the intermediate stopping points for *-ka*. That is, we have reason to believe that *-ka* can move to each complementizer successive-cyclically between its base position and its eventual position.

So, the second point is this: *-ka* can move to every complementizer along the way, whether interrogative or not.[3]

As it turns out, this movement of *-ka* to intermediate complementizers is sensitive to intervenors; we can understand this if it is simply feature attraction of the same sort that moves *-ka* to interrogative complementizers. The data which show this are displayed schematically in (4). (4) is also the contrast which is fatal for the Remote Generation account.

(4) a. ??? ... $[_{\text{island}}$ ... [... Int. ... *wh* ... that] ...] t_{ka} ... -ka ?
b. ... $[_{\text{island}}$ ... [... wh_i ... Int. ... t_i ... that] ...] t_{ka} ... -ka ?

In the examples diagrammed above, both the intervenor and the *wh*-word appear inside a declarative clause embedded *inside* an island. In (4a), where the *wh*-word follows the intervenor, the example is degraded; it exhibits an intervention effect, meaning that *-ka* was attracted across the intervenor. Scrambling the *wh*-word over the intervenor, as in (4b), solves the problem, rendering the question well-formed again. This follows if *-ka* is attracted to the embedded declarative complementizer on its way to the clause periphery, just as we expect from successive cyclicity.[4]

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[3] Richards (1997, ch. 4) also makes a proposal that has this character, suggesting that even *declarative* C can have an attracting feature to allow for successive-cyclic movement (e.g., in English). Also, as I mentioned in a footnote in chapter 3, the successive-cyclic movement of Q suggests connections with "*wh*-agreement" phenomena in Irish (McCloskey 1979) and Chamorro (Chung 1994), but these connections have not been pursued here.

[4] This explanation requires us to assume that the islands themselves are not introduced by complementizers (e.g., a relative clauses in Japanese project only to IP). I assume that this is true; arguments for this position can be found in Murasugi (1991, chapter 3) and in Tanaka (1997, appendix to ch. 3). Thanks to Shigeru Miyagawa (p.c.) for pointing this out to me. This means, of course, that I must also assume that

(...continues) ➡

The crucial thing to notice about (4) is that the intervention effect is taking place *inside the island.* We know from the grammaticality of (4b) that the *launching site* of *-ka* is outside the island, just as in all cases where a *wh*-word is inside an island. Yet, *-ka* is causing intervention effects *inside* the island, meaning that it must have been base generated inside the island. This is conclusive evidence against Remote Generation, thus evidence for Local Generation (as well as for successive-cyclic movement of *-ka*).

The actual Japanese examples which (4) schematizes are in (5), below.[5]

(5) a. ??? Taroo-wa [Hanako-ga [John-**ka** Mary-ga **nani**-o sita to]
Taroo-TOP Hanako-NOM John-or Mary-NOM **what**-ACC did that
itta ato de] kaetta no?
said after go.home Q
('What did Taro go home after Hanako said John or Mary did?')

b. Taroo-wa [Hanako-ga [**nani**-o_i John-**ka** Mary-ga t_i sita to]
Taroo-TOP Hanako-NOM **what**-ACC John-or Mary-NOM did that
itta ato de] kaetta no?
said after go.home Q
'What did Taro go home after Hanako said John or Mary did?'
(Shigeru Miyagawa, Hidekazu Tanaka, p.c.)

This also makes some sense out of the example in (6), reported by Watanabe (1992a), who credits it to an anonymous *Linguistic Inquiry* reviewer. This case involves a *wh*-word inside a *wh*-island, further embedded inside a complex noun phrase. This is a problematic example under Watanabe's (1992a) account, which is essentially a Remote Generation explanation. Watanabe predicts that movement (in his account, movement of an empty operator) should take place from outside the CNP island; therefore, it should not interact with the *wh*-island embedded within the CNP.

(6) ?? [[Mary-ga nani-o katta kadooka] Tom-ni tazuneta hito-ga]
Mary-NOM what-ACC bought whether Tom-DAT asked person-NOM
kubininatta no?
was.fired Q
('The person who asked Tom whether Mary bought what was fired?)'
(Watanabe 1992a:59)

On the other hand, under Local Generation, (6) is just another example like (5a); *-ka* is base generated next to *nani* and is attracted to the intermediate C; however, *kadooka* 'whether', which is an intervenor, is in the way and interferes with this movement.[6]

(continued...)
the adjunct islands (e.g., (5b)) lack a C as well; i.e. *ato de* 'after' in (5b) does not involve a complementizer. However, as noted by Pesetsky (1987:124), these phrases in Japanese do seem to have a relative-clause-like structure.

[5] Unfortunately, the judgments vary over the consultants I asked. Hidekazu Tanaka (p.c.) gets the contrast in (5), but this may not show anything because he also finds (3b) worse than (3c). Junko Shimoyama (p.c.) found no difference between (5a) and (5b). As before, I must leave an account of the variation for the future.

[6] There are certain questions about the structure of *wh*-islands that come up at this point, although I will have little insightful to say about them; see the brief discussion in section 4 of this chapter. To get the effect in (6) it need only be true that some relevant part of *kadooka* lies along the path *-ka* would have to

(...continues) ➡

As we would predict, if the intervenor is outside the embedded declarative clause (thereby placing it off the path of "*-ka*-attraction" from its base position to the embedding complementizer), the intervention effect disappears again, as in (7).

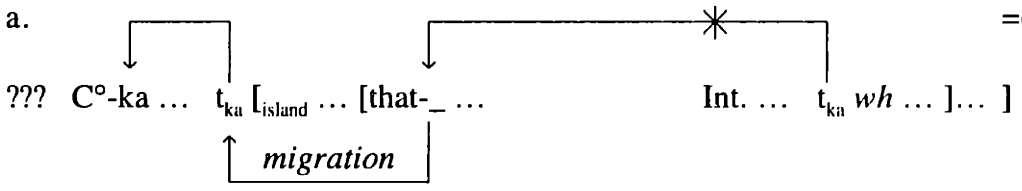
(7) Taroo-wa [John-**ka** Mary-ga [Hanako-ga **nani**-o sita to]
Taroo-TOP John-or Mary-NOM Hanako-NOM **what**-ACC did that
itta ato de] kaetta no?
said after go.home Q
'What did Taroo go home after John or Mary said Hanako did?'
(Shigeru Miyagawa, Junko Shimoyama, Hidekazu Tanaka, p.c.)

The Local Generation account we have been giving relies on the existence of *two* distinct kinds of movement operations. The first is movement by feature attraction; this type of movement is responsible for moving Q to complementizers (both interrogative and non-interrogative). A side effect of this form of movement is that intervenors like *dareka* cannot be along the path of movement. Of course, we would expect feature attraction to be sensitive to intervenors which share features, just by the very nature of the operation; a closer item will block movement of a further item with identical features, straightforwardly.

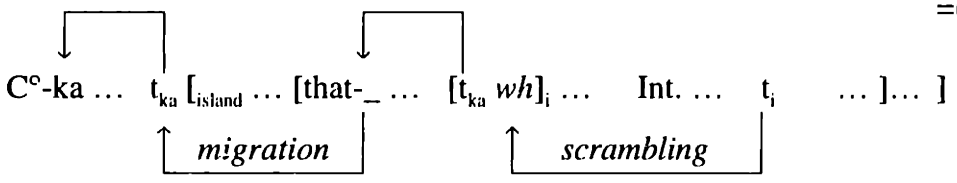
The second kind of movement is *not* driven by feature attraction (as we know since it is not sensitive to the presence of intervenors). This is the kind of movement that takes Q from its base position to the edge of islands, oblivious to the presence of intervenors like *dareka*. We will refer to this type of movement as "migration", for lack of a better term.

A more complete schematic picture of the examples in (5) and (7), including Q-migration, is given below in (8). In these illustrations, order reflects hierarchy (not surface order).

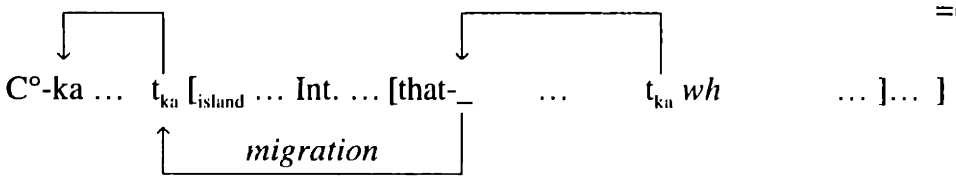
(8) a. =(5a)



b. =(5b)



c. =(7)



(continued...)
take to get to the complementizer—that is, (some part of) *kadooka* is below C. Recall that this was already proposed in a footnote in the section on additional-*wh* effects at the end of chapter 3.

Let us explore the properties of this "migration" of Q further. First, it is clear that—in the cases we have found it happening—migration must be *overt*. We can see this by looking at the Sinhala examples in (9), where the *wh*-word is inside two islands (inside a complex NP island and then inside an adverbial island). The three versions of the question vary with respect to where *də* appears. In (9a), *də* is outside of the outermost island, and the example is acceptable. In (9b), *də* is outside the innermost island, but still inside the outermost island, and the question is no good. Not surprisingly, *də* inside both islands (9c) is ill-formed as well.

(9) a. [Siri [Chitra **kaa**-ṭə dunnə potə] kieuwa hamə] **də**
Siri Chitra **who**-DAT gave book wrote when **Q**
Ranjit pudumə unee?
Ranjit surprised became-**E**
'Ranjit was surprised when Siri read the book that Chitra gave to whom?'

b. * [Siri [Chitra **kaa**-ṭə dunnə potə] **də** kieuwa hamə]
Siri Chitra **who**-DAT gave book **Q** wrote when
Ranjit pudumə unee?
Ranjit surprised became-**E**
'Ranjit was surprised when Siri read the book that Chitra gave to whom?'

c. * [Siri [Chitra **kaa**-ṭə **də** dunnə potə] kieuwa hamə]
Siri Chitra **who**-DAT **Q** gave book wrote when
Ranjit pudumə unee?
Ranjit surprised became-**E**
'Ranjit was surprised when Siri read the book that Chitra gave to whom?'
(Arjuna Wijeyekoon, Kumara Henadeerage, p.c.)

The generalization is that *də* cannot be overtly separated from the clause periphery by *any* islands. If Q-migration could proceed covertly, all three questions in (9) should be fine. We can therefore conclude that a basic property of migration is that it is overt.

A second important property of Q-migration is that it seems to only carry Q to island boundaries. To repeat a paradigm from chapter 2, we see below that *də* cannot appear inside an island (10a), can appear outside the island (10b), but cannot appear further away (10c–e)

(10) a. * [**kau** **də** enə koṭə] Ranjit paaḍam kəramin hiṭie?
who **Q** came time Ranjit study doing was-**E**
('Ranjit was studying when who came?')

b. [**kauru** enə koṭə] **də** Ranjit paaḍam kəramin hiṭie?
who came time **Q** Ranjit study doing was-**E**
'Ranjit was studying when who came?' (Kishimoto 1992:58)

c. * [**kauru** enə koṭə] Ranjit **də** paaḍam kəramin hiṭie?
who came time Ranjit **Q** study doing was-**E**
('Ranjit was studying when who came?')

d. * [**kauru** enə koṭə] Ranjit paaḍam **də** kəramin hiṭie?
who came time Ranjit study **Q** doing was-E
('Ranjit was studying when who came?')

e. * [**kauru** enə koṭə] Ranjit paaḍam kəramin **də** hiṭie?
who came time Ranjit study doing **Q** was-E
('Ranjit was studying when who came?') (Dileep Chandralal, p.c.)

The movement of *də* to the edge of the island in (10b) is Q-migration, which is required for convergence. However, there do not appear to be any other legitimate sites to which *də* can migrate.[7]

It appears that Q-migration is only allowed at certain specific points in the derivation; one place we know that Q-migration can occur is at island boundaries. Let us put this part of the discussion on hold until chapter 8, at which point the semantic analysis will have been introduced.

Before leaving this section, a note about the successive-cyclic movement of *-ka* is in order.[8] The evidence we have seen from *ittai* (chapter 3, and above) shows that *-ka* can stop at intermediate complementizers, but not that it must. However, in order to derive the result in (4)—showing intervention effects even inside an island—we need to assume that *-ka* must move to intermediate complementizers. How to work this out technically is not completely clear, but let me make a few comments.

We could suppose that there are two kinds of declarative complementizer, one (C_{all}) which attracts *-ka*, and one (C_{non}), which does not. It must be possible to choose the complementizer that does not attract *-ka* in order to allow for clauses which contain non-Q instances of *-ka* (e.g., *dareka* 'someone', *John-ka Bill* 'John or Bill', and the rest of the intervenors). However, it must *not* be possible to attract *-ka* over a non-attracting complementizer; that is, *-ka* must move to *each* intermediate complementizer. We might say that the non-attracting complementizer (C_{non}) creates an "island" for *-ka*-extraction, but there is a danger in using this terminology: if C_{non} really *does* form an island of the sort we have been discussing in this section, *-ka* should be able to migrate to the edge of that island (and thereby escape).[9] Instead, let us tentatively adopt an idea from Chomsky (1998) outlined briefly below.

Chomsky (1998) proposes that the computational system allows only derivations for which the numeration (the array of lexical elements used by C_{HL} in the derivation) has neither too few elements nor too many elements for convergence. Following this through suggests that the derivation proceeds by converging at each clause, at which point a new

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[7] Notice that if *də* could move *past* the island boundaries, we would expect it to be able to void "intervention effects", since Q-migration over an intervenor is grammatical.

[8] Thanks to David Pesetsky (p.c.) for forcing me to be explicit about these issues.

[9] David Pesetsky (p.c.) tells me that in Irish, where there is arguably a visible morphological distinction between C_{non} and C_{all}, choosing C_{non} along the path of *wh*-movement "feels like" a Subjacency violation—that is, like extraction out of an island. Such an intuition would suggests that C_{non} might in fact be a island, in which case we would have to differentiate islands which have some property P (adjunct islands, CNP islands) from islands which lack property P (islands formed by C_{non}), where it is having the property P that allows Q-migration. Studying this case might help narrow down the options for property P and shed some light on Q-migration generally, but I have not explored the facts of Irish enough to take the discussion further here.

numeration can be chosen to extend the converged derivation.[10] Chomsky suggests further that operations can only "look into" a converged category α as deep as its label, meaning that extraction can only occur from the *edge* of α.[11] Under such a view, if *-ka* has *not* moved to C_{non} and the derivation continues, *-ka* cannot be later extracted, even if C_{att} is merged in a higher clause. It is still true that the opacity of converged categories must be qualitatively different from the property of islands that triggers Q-migration; that is, we now have a way to think about enforced successive-cyclicity of *-ka*-movement, but the question of what property is shared by the islands triggering Q-migration remains open.

As mentioned above, we will return to this discussion in chapter 8, although even there most of these questions will remain basically unanswered.

2. Subjacency and LF pied piping

Back in chapter 2, we saw strong evidence from Sinhala that covert movement must obey island constraints. In particular, we saw that the question marker *də* could not appear inside islands, although it was allowed outside of islands. Assuming that *də* moves to the clause periphery, it is clear that the movement must be covert, and that this movement is not allowed to cross island boundaries.

Given that even covert movement is sensitive to movement islands, the challenge is to explain how *wh*-words are nevertheless allowed inside CNP and adjunct islands in Japanese. In chapters 2 and 3, we gave an answer to this question: the relevant (island-sensitive) movement takes place from *outside* the island.

With respect to *what* exactly moves to the clause periphery, there is an alternative view which we will review in this section. The proposal being defended in this thesis is that it is the question marker *alone* which moves. Our primary reason for believing this is the close correspondence between Japanese *-ka* and Sinhala *də*, and the fact that *-ka* in Japanese appears *alone* at the right edge of the interrogative clause. The alternative view we discuss in this section is commonly referred to as "LF pied piping", and it holds that a much larger (phrasal) constituent moves. Specifically, under the LF pied piping view, the entire constituent which in Sinhala is *marked* by *də* moves. This type of account originates in work by Nishigauchi (1990), Choe (1987), Pesetsky (1987), and is adopted by several other authors, including Kishimoto (1992) (who adopts it for Sinhala).

Much of the empirical evidence overlaps between the two proposals, and so in this section we will review evidence which might differentiate the two. We will begin by looking at the "weak crossover" arguments presented by Choe (1987) and Nishigauchi (1990), and then turn to the counterarguments presented by von Stechow (1996a) and Ohno (1989). The conclusions we will draw (basically following von Stechow and Ohno) are that (a) the arguments which at first appear to support the LF-pied piping approach are

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[10] Chomsky (1998) points out that cases like *There was evidence presented that [a unicorn is in the garden]* require a view like this, since if *there* were in the numeration when the embedded clause is constructed, the preference for Merge over Move (cf. Chomsky 1995) would require *there* to be merged in the embedded clause.

[11] Specifically, Chomsky suggests that the label of α (L(α)) and β c-commanding the L(α) are visible, which allows for specifiers of L(α) to be visible (e.g., for successive-cyclic *wh*-movement).

in fact inconclusive and (b) the predictions that LF-pied piping makes for the semantics are wrong.

Choe (1987) presents an argument based on weak crossover (WCO) intended to show that there is movement of the *entire* island containing a *wh*-word (in Japanese and in Korean). This argument, if it goes through is an argument against the analysis we have been developing. However, we will see that there is a confound that renders the argument inconclusive for the general case.

Weak crossover refers to the unacceptability that arises when a *wh*-word (or other moved operator, such as a quantifier raised by QR) must move across a variable in order to bind it. This is illustrated in (11); (11a,b) are acceptable because the *wh*-word or quantifier moved both from and to a position above the bound pronoun, while (11c,d) are unacceptable because such movement had to cross over the pronoun in order to bind it. (11e) indicates (under certain assumptions) that *everyone* is capable of scoping above the subject, which shows that *everyone* is capable of taking scope over something it does not c-command in the surface form; this means that (11d) is not ruled out simply because the variable is not in the surface scope of its binder.

(11) a. Who$_i$ (t_i) likes his$_i$ mother?
b. Everyone$_i$ likes his$_i$ mother.
c. ?* Who$_i$ does his$_i$ mother like t_i?
d. ?* His$_i$ mother likes everyone$_i$.
e. Someone likes everyone. '$\forall x \exists y$[y likes x]'

As a baseline, both Japanese and Sinhala seem to show effects of WCO in simple contexts. Saito (1985) pointed out that the contrast in (12a–b) suggests that *dono hon-o* 'which book' moves over the coindexed pronoun causing a WCO violation whereas *sono hon-o* 'that book' does not. Saito also observes that scrambling the *wh*-word over the coindexed pronoun as in (12c) saves the question.

(12) a. John-wa [Mary-ga e_i yomu mae-ni] **sono hon**$_i$-o yonda.
John-TOP Mary-NOM read before **that book**-ACC read
'John read that book$_i$ before Mary read it$_i$.'

b. ?* John-wa [Mary-ga e_i yomu mae-ni] **dono hon**$_i$-o yonda?
John-TOP Mary-NOM read before **which book**-ACC read
('Which book$_i$ did John read before Mary read it$_i$?') (Saito 1985:103)

c. [**dono hon**$_i$-o]$_j$ John-wa [Mary-ga e_i yomu mae-ni] t_j yonda?
which book-ACC John-TOP Mary-NOM read before read
'Which book$_i$ did John read before Mary read it$_i$?' (Saito 1985:105)

Kishimoto (1992) shows that the parallel contrasts hold in Sinhala (13). Example (13d) shows that the universal quantifier *monə potə-t* 'every book' exhibits the same behavior as *monə potə də* 'which book Q'.

(13) a. Chitra [Ranjit e_i kiəwannə issella] **ee potə**$_i$ kieuwa.
Chitra Ranjit read before **that book** read
'Chitra read that book$_i$ before Ranjit read it$_i$.'

b. ?* Chitra [Ranjit e_i kiəwannə issella] **monə potə$_i$ də** kieuwe.
Chitra Ranjit read before **what book Q** read-**E**
('What book$_i$ did Chitra read before Ranjit read it$_i$?')

c. **[monə potə$_i$ də]$_j$** Chitra [Ranjit e_i kiəwannə issella] t_j kieuwe.
what book Q Chitra Ranjit read before read-**E**
('What book$_i$ did Chitra read before Ranjit read it$_i$?')

d. ?* Chitra [Ranjit e_i kiəwannə issella] **monə potə$_i$ t** kieuwa.
Chitra Ranjit read before **what book T** read
('Chitra read every book$_i$ before Ranjit read it$_i$.') (Kishimoto 1992)

A WCO violation arises when a constituent moves (by means of QR or *wh*-movement at least) over a coindexed pronoun. After this movement, there is a binding relation between the moved constituent and the (now) c-commanded and coindexed pronoun. In (12) and (13), assuming that *wh*-words and quantifiers must move to bind the coindexed (null) pronoun, this movement will cross the pronoun, resulting in the observed ill-formedness of the (b) and (d) examples.

Under the LF pied-piping approach, if a *wh*-word is embedded inside an island, the whole island behaves as if it were a *wh*-phrase,[12] and must therefore move in its entirety to the scope position. If the whole *island* is *wh*-moving, WCO should prohibit movement over a pronoun which is co-indexed with the *island*. Choe (1987) observed that this seems to be exactly what happens in Japanese, shown in (14).

(14) a. John-wa [Mary-ga e_i yomu mae-ni] [Judy-ga kaita hon]$_i$-o
John-TOP Mary-NOM read before Judy-NOM wrote book-ACC
yonda no?
read Q
'Did John read the book$_i$ that Judy wrote before Mary read it$_i$?'

b. * John-wa [Mary-ga e_i yomu mae-ni] [**dare**-ga kaita hon]$_i$-o
John-TOP Mary-NOM read before **who**-NOM wrote book-ACC
yonda no?
read Q
('Who did John read the book$_i$ that wrote before Mary read it$_i$?')
(Choe 1987:352)

c. [**dare**-ga kaita hon]$_i$-o$_j$ John-wa [Mary-ga e_i yomu mae-ni] t_j
who-NOM wrote book-ACC John-TOP Mary-NOM read before
yonda no?
read Q
'Who did John read the book$_i$ that wrote before Mary read it$_i$?'
(Shigeru Miyagawa, p.c.)

The (a) example has no *wh*-words, as a control case, and the (b) example shows a WCO effect. Importantly, the pronoun inside the temporal adjunct is not coindexed with the *wh*-word in this case, but rather with the whole CNP (it refers to a *book*, not to an *author*).

[12] Nishigauchi (1990) proposes a mechanism of feature percolation that allows an entire island to be [+wh].

The (c) examples show that scrambling the island solves the problem, which indicates that scrambling (at least in these examples) is exempt from WCO effects.[13]

Kishimoto (1992) replicates Choe's paradigm in Sinhala, below in (15).

(15) a. Chitra [Ranjit e_i gannə issella] [[Ram liyəpu] potə]$_i$ wikka.
Chitra Ranjit buy before Ram wrote book sold
'Chitra sold the book$_i$ which Ram wrote before Ranjit bought it$_i$.'

b. ?* Chitra [Ranjit e_i gannə issella] [[**kauru** liyəpu] potə]$_i$ **də** wikke?
Chitra Ranjit buy before **who** wrote book **Q** sold-**E**
('Chitra sold the book$_i$ that who wrote before Ranjit bought it$_i$?')

c. [[**kauru** liyəpu] potə]$_i$ **də** [Ranjit e_i gannə issella] t_i wikinunee?
who wrote book **Q** Ranjit buy before was.sold-**E**
'The book$_i$ that who wrote was sold before Ranjit bought it$_i$?'
(Kishimoto 1992)

Assuming that WCO reliably diagnoses the moving constituent, the examples above provide strong evidence that the entire island (and not just *-kaldə* alone) is moving before interpretation in these cases. However, there is a problem with generalizing this result.

Von Stechow (1996a) points out that regardless of what happens in the *absence* of a coindexed pronoun, movement is required in order to establish binding if a sentence contains a pronoun coindexed with a nonreferential element (like an island containing a *wh*-phrase) which does not c-command the pronoun on the surface.[14] As an example, reconsider the empty pronoun inside the adjunct in (14b), repeated below.

(14) b. * John-wa [Mary-ga e_i yomu mae-ni] [**dare**-ga kaita hon]$_i$-o
John-TOP Mary-NOM read before **who**-NOM wrote book-ACC
yonda no?
read Q
('Who did John read the book$_i$ that wrote before Mary read it$_i$?')

The null pronoun is intended to be coindexed with the matrix object, *dare-ga kaita hon-o* 'the book that who wrote.' The matrix object clearly does not have a fixed referent, so the coindexation relation between the null pronoun and the matrix object is not a relation of co-*reference*; after all, how could a pronoun be co-referential to something without a fixed referent? Instead, the relation must be a *binding* relation.[15] Yet in the surface form of

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[13] The standard account of this (Mahajan 1990) is that short-distance scrambling can be "A-movement" but WCO is only sensitive to "A-bar movement." QR and *wh*-movement are instances of A-bar movement. Saito (1992) discusses Mahajan's contrasts (originally about Hindi) in the context of Japanese. Many issues arise here, but they are mostly irrelevant for this discussion.

[14] This is essentially the same counterargument that Rooth (1985) presents in response to Chomsky's (1976) WCO-based argument for enforced movement of focused elements for scope.

[15] What is crucial is the requirement of binding, not the existence of a fixed referent *per se*, as David Pesetsky (p.c.) reminds me. That is, a focused element will generally have a fixed referent, but (as mentioned in footnote 14), the argument against WCO also holds for focus. Rooth (1985) distinguishes two kinds of coreference, one which requires binding and one which does not. In (i), where coreference between *he* and *John* would require binding, it is not allowed. Setting up the context as in (ii) (which

(...continues) ➡

(14b), such a binding relation is impossible because the empty pronoun is not c-commanded by its would-be binder. Therefore, in order for (14b) to be interpretable at all, the matrix object must therefore move, e.g. by QR, to a position c-commanding the empty pronoun. However, this movement is exactly the sort of movement that triggers WCO violations.

Notice that in (14a), repeated below, the matrix object *does* have a fixed referent, and so co-reference between the null pronoun and the matrix object can be established without binding, and therefore without movement over the adjunct.

(14) a. John-wa [Mary-ga e_i yomu mae-ni] [Judy-ga kaita hon]$_i$-o
John-TOP Mary-NOM read before Judy-NOM wrote book-ACC
yonda no?
read Q
'Did John read the book$_i$ that Judy wrote before Mary read it$_i$?'

The point of the foregoing discussion is this: Indeed, Choe's (1987) examples *do* show that the entire island must move *in these cases* (where there is a pronoun bound by a *wh*-phrase embedded inside an island). However, what his examples do *not* show is that this happens in *general* when a *wh*-word is embedded in an island. Rather, it is the WCO test *itself* that forces movement of this constituent. To put it another way, Choe's argument shows that movement of the island *can* happen, but not that it *must* (in general) happen. This effectively leaves us without any argument either for or against LF pied-piping outside the test context, and in particular, disposes of a potential counterargument to the proposal being developed in this thesis.

Having neutralized the WCO argument for LF pied piping, von Stechow (1996a) (in large part following Ohno 1989) goes on to provide a more serious reason to question Nishigauchi's (1990) LF pied piping analysis: It predicts the wrong meanings.

Consider example (16a). The proposed LF representation under the LF pied piping approach is given in (17a), which should translate to (17b) in Nishigauchi's system. There is a crucial problem with this translation: the object inside the question nucleus varies over *books* rather than over *authors*. Empirically, this is wrong; the question in (16a) cannot be answered by naming books, it must be answered by naming authors.

(16) a. Kimi-wa **[dare**-ga kai-ta hon-o] yomi-masi-ta **ka**?
you-TOP **who**-NOM wrote book-ACC read.POL **Q**
'Who did you read books that t wrote?'

(17) a. [dare-ga kai-ta hon-o]$_j$ [Kimi-wa t$_j$ yomi-masi-ta] ka?
b. For which x, y, x a book, y a person that wrote x, you read x?

(continued...)
Rooth attributes to Rochemont 1978) facilitates the reading in which coreference is "accidental" and not binding-dependent; here, coreference is possible between *he* and *John*.
(i) We only expect the woman he loves to betray JOHN.
(ii) A: Sally and the woman John loves are leaving the country today.
B: I thought that the woman he loves had BETRAYED Sally.
C: No—the woman he loves betrayed JOHN; Sally and she are the best of friends.

For the *correct* interpretation, the island must be interpreted in its base position, as in (18).[16]

(18) For which y, y a person, did you read a book that y wrote?

We will return to a much more detailed discussion of the semantics of questions in the chapters 5–7. The account we will develop in chapter 5 does not have the problem described above.

To recap, we have introduced the LF pied piping account of why *wh*-words are allowed inside islands in Japanese and in Sinhala. Following von Stechow (1996a) and Ohno (1989), we have concluded that the LF pied-piping proposal predicts the wrong semantics for these questions. We have also seen that the apparent evidence for LF pied-piping from WCO is fatally confounded by the fact that wherever the test can be performed, covert movement (QR) is independently required.

3. Japanese *-koso* and a single cycle syntax

In Japanese, there is an emphatic particle *-koso* which can be attached to nominal arguments.[17] A simple example is given in (19) below.[18]

(19) John-**koso** LGB-o yonda.
John-**EMPH** LGB-ACC read
'*John* read LGB.'

In sentences with a *-koso*-marked phrase, certain ordering restrictions arise between the arguments. Tanaka (1997b) explores these ordering restrictions in detail, and we will review some of his discoveries here.[19]

First, observe that *-koso* must precede *-ka*; that is, an NP marked with *-koso* must precede each of the now-familiar class of elements involving *-ka*, including *-sika*, *dareka*, and disjunctive *-ka*. Examples are given below.[20]

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[16] In von Stechow's (1996a) analysis, this is accomplished by first pied piping the island (essentially as Nishigauchi 1990 proposes), then adjoining the *wh*-word to the island and reconstructing the island (now minus the *wh*-word) back into the question nucleus. Of course, this leads to several technical issues, particularly with respect to the motivation for the movements von Stechow proposes; without discussion of these motivations, it is not clear that the system does more than restate the facts in technical terminology.

[17] Recall from the discussion in chapter 2 that *-koso* is an emphatic *kakari*-particle that has survived from premodern Japanese. In premodern Japanese (and until fairly recently, according to Leon Serafim (p.c.)), *-koso* triggered a special verbal (*musubi*) form (different from the adnominal form triggered by other *kakari*-particles). In modern Japanese, this distinction is no longer reflected in the form of the verb.

[18] Takako Aikawa (p c.) tells me that *-koso* sentences sound more natural embedded under *beki-da* 'should'; for example (i) (cf. (19)). I have not incorporated this into the examples in the text, however.

(i) John-koso LGB-o yomu beki-da.
John-EMPH LGB-ACC read should
'*John* should read LGB.' (Takako Aikawa, p.c.)

[19] Cho (1997) provides data from Korean that seems to indicate that contrastive topics work like Japanese *-koso*. Japanese, of course, also has a contrastive topic, but I do not at the moment know if it behaves in the same way as the contrastive topic in Korean.

(20) a. John-**koso** LGB-si**ka** yoma-nai.
John-**EMPH** LGB-only$_{NPI}$ read-NEG
'*John* reads only LGB.'

b. ?* LGB-si**ka**$_i$ John-**koso** t_i yoma-nai.
LGB-only$_{NPI}$ John-**EMPH** read-NEG
('*John* reads only LGB.') (Tanaka 1997b:72)

(21) a. John-**koso** [LGB-**ka** Barriers]-o yonda.
John-**EMPH** LGB-or Barriers-ACC read
'*John* reads either LGB or Barriers.'

b. ?* [LGB-**ka** Barriers]-o$_i$ John-**koso** t_i yonda.
LGB-or Barriers-ACC John-**EMPH** read
('*John* reads either LGB or Barriers.') (Shigeru Miyagawa, p.c.)

(22) a. LGB-**koso**$_i$ dare**ka**-ga t_i yomu koto-wa nai.
LGB-**EMPH** someone-NOM read fact-TOP NEG
'There's no chance that someone reads only *LGB*.'

b. ?* dare**ka**-ga LGB-**koso** yomu koto-wa nai.
someone-NOM LGB-**EMPH** read fact-TOP NEG
('There's no chance that someone reads only *LGB*.')
(Shigeru Miyagawa, p.c.)

The type of pattern seen above is familiar by now; these appear to be straightforward intervention effects of the kind introduced in chapter 2. This suggests that what is wrong in the (b) examples above is that *-ka* interferes with a movement relation between *-koso* and some clause-level position.

(23) *Observation*
There is a movement relation between *-koso* and the clause periphery.
Intervenors (*dareka*, etc.) are prohibited from occurring along the movement path.

Additional evidence that *-koso* involves a movement relation between its overt position and the clause periphery comes from the fact that *-koso* cannot be within an island. (24b), for example, is ruled out because *-koso* is within a complex noun phrase island.[21]

(continued...)

[20] The addition of *koto-wa nai* 'there's no chance that...' in (22) is intended to bias against a specific interpretation of *dareka* 'someone'. When *dareka* is truly quantificational, the pattern appears to be as strong as with *-sika* and disjunctive *-ka*. Thanks to Shigeru Miyagawa (p.c.) for bringing this to my attention.

[21] When the complementizer element *to yuu* is added, as in (i), *-koso* inside a relative clause seems to improve somewhat. Hidekazu Tanaka (p.c.) suggests that *-to yuu* might derive from 'that say', in which case this might be some form of a quotation.

(i) a. Taroo-ga [Mary-ga LGB-**o** katta **to yuu** mise-o] sitteiru.
Taroo-NOM Mary-NOM LGB-ACC bought **that *yuu*** store-ACC knows
'Taroo knows the store where Mary bought LGB.'

(...continues) ➡

(24) a. Taroo-ga [Mary-ga LGB-**o** katta mise-o] sitteiru.
Taroo-NOM Mary-NOM LGB-ACC bought store-ACC knows
'Taroo knows the store where Mary bought LGB.'

b. * Taroo-ga [Mary-ga LGB-**koso** katta mise-o] sitteiru.
Taroo-NOM Mary-NOM LGB-EMPH bought store-ACC knows
'Taroo knows the store where Mary bought *LGB*.'
(Shigeru Miyagawa, p.c.)

Thus we conclude that *-koso* is associated by movement to a projection within the complementizer system. Since the *-koso* phrase appears to be in situ, this movement must be covert. The fact that *-koso* cannot appear below an instance of *-ka* indicates that *-koso*-movement is blocked by some feature contained in *-ka*.

Remember (from chapter 2) that the reason *wh*-words must generally precede intervenors like *dareka* is that (a) *dareka* contains *-ka*, (b) Q starts down next to the *wh*-word, and (c) Q cannot move across *-ka*. The reason for (c) is that *-ka* (and *-mo*) both share with Q the feature involved in the movement. To say it another way, *-ka* and Q are indistinguishable from the point of view of the movement operation, and so whichever of them is closest to the attracting target must move. We can transfer this reasoning to the restrictions on *-koso* as well. Suppose that *-koso* and *-ka* are indistinguishable from the point of view of the attraction of *-koso*. More formally, the feature of *-koso* which is attracted to the clause periphery is also a feature of *-ka*.

To make the idea clearer, a simple illustration is given below. For identification, suppose that the feature that *-koso* and *-ka* share is F_1, and the clause-level head which attracts F_1 (causing the movement of *-koso*) is $H_{koso}°$.

(25) a. * $[_{HkosoP}\ H_{koso}°\ [$ ... dare-**ka** LGB-koso yomu ...
↑ (F_1) ✳

b. $[_{HkosoP}\ H_{koso}°\ [$ ... LGB-koso$_i$ dare-ka t_i yomu ...
↑ (F_1)

In (25a), *dareka* precedes *-koso*. When $H_{koso}°$ attracts F_1, the *-ka* from *dareka* is the closest element with F_1 (since both *-koso* and *-ka* have F_1), so *-ka* moves, leaving *-koso* clause-internal and uninterpretable. In the good case (25b), where *-koso* precedes *dareka*, no problems arise; $H_{koso}°$ attracts F_1, and the closest element with F_1 is *-koso*. *-koso* moves to $H_{koso}°$ and the derivation converges.

The paradigm in (26) shows that the *kadooka* 'whether' in an interrogative clause also intervenes in the movement path of *-koso*.

(continued...)

b. ?? Taroo-ga [Mary-ga LGB-**koso** katta **to yuu** mise-o] sitteiru.
Taroo-NOM Mary-NOM LGB-EMPH bought **that *yuu*** store-ACC knows
'Taroo knows the store where Mary bought LGB.' (Shigeru Miyagawa, p.c.)

(26) a. John-ga [kinoo Mary-**koso** LGB-o yonda to] omotteiru.
John-NOM yesterday Mary-**EMPH** LGB-ACC read that thinks.
'John thinks that *Mary* read LGB yesterday.'

b. * John-ga [kinoo Mary-**koso** LGB-o yonda kadoo**ka**]
John-NOM yesterday Mary-**EMPH** LGB-ACC read whether
sirigatteiru.
want.to.know
('John wants to know whether *Mary* read LGB yesterday.')

c. John-ga Mary-**koso**$_i$ [kinoo t_i LGB-o yonda kadoo**ka**]
John-NOM Mary-**EMPH** yesterday LGB-ACC read whether
sirigatteiru.
want.to.know
'John wants to know whether *Mary* read LGB yesterday.'
(Shigeru Miyagawa, p.c.)

In (26a) we see that *-koso* is allowed inside an embedded non-interrogative clause, and the relative position with respect to *kinoo* 'yesterday' ensures that *-koso* is not in the matrix clause. In (26b), where the embedded clause is interrogative, the result is ill-formed. Note that if *-koso* appears to the left of *kinoo* (26c), indicating that it has been scrambled out of the interrogative clause, then the sentence becomes well-formed again.

The possibility that the *-koso*-phrase can be scrambled out of the embedded clause (meaning that the *-ka* of *kadooka* 'whether' does not structurally intervene between *-koso* and the clause periphery) explains the well-formedness of the *prima facie* counterexample in (27) from Tanaka (1997b). This case is exactly like (26c) except without *kinoo* as a clausal landmark; in (27), *-koso* is actually outside of the embedded clause.

(27) John-ga [Mary-**koso** LGB-o yonda kadoo**ka**] siritagatteiru.
John-NOM Mary-**EMPH** LGB-ACC read whether want.to.know
'John wants to know whether *Mary* read LGB.' (Tanaka 1997b:205)

So far, we have seen evidence that *-koso* is involved in a movement relation with a complementizer-level head and that this movement is accomplished by attracting a feature (F_1) which is also a feature of *-ka*. Now, let us turn to another intervention effect we find with *-koso* which turns out to have serious implications for the structure of the derivation. The effect in question is illustrated below: *-koso* must precede *wh*-words like *dare* 'who' and *nani* 'what'. The examples in (28) and (29) show this for object and subject *wh*-words, respectively.

(28) a. ?* **nani**-o$_i$ John-**koso** t_i yonda no?
what-ACC John-**EMPH** read Q
('What does *John* read?')

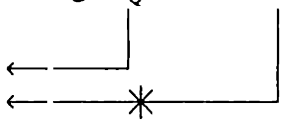
b. John-**koso** **nani**-o yonda no?
John-**EMPH** **what**-ACC read Q
'What does *John* read?' (Tanaka 1997b:71)

(29) a. ?* **dare**-ga LGB-**koso** yonda no?
what-NOM LGB-**EMPH** read Q
('Who reads *LGB*?')

b. LGB-**koso**$_i$ **dare**-ga t_i yonda no?
LGB-**EMPH** **who**-NOM read Q
'Who reads *LGB*?' (Tanaka 1997b:71)

We know from above that *-ka* blocks association of *-koso* with the clause periphery, so it is presumably the fact that *-ka* (i.e., Q) starts out by the *wh*-word in the examples above that rule out the (a) examples. That is to say, it is the fact that the *-koso* movement relation must cross the launching site of *-ka*. The idea is sketched in (30), where *-koso* is shown being attracted over the launching site of *-ka*.[22]

(30) dare-ga t_Q LGB-koso yonda ...



Incidentally, this implies that the *landing* site of *-ka* (at the clause periphery) cannot intervene between *-koso* and $H_{koso}°$, either. This means that *-ka* must end up higher than $H_{koso}°$ (so that $H_{koso}°$ can attract *-koso* without *-ka* intervening). That is to say, the head which attracts *-ka* ($H_{ka}°$) must be structurally higher than the head which attracts *-koso* ($H_{koso}°$).

There is something slightly paradoxical hiding here, however. We know that *-ka* moves *overtly* to the clause periphery, while *-koso* moves only *covertly* to its clausal position. If all overt movement precedes all covert movement, then *-ka* should be out of the way by the time *-koso* is attracted. We know that the head which attracts *-koso* must be structurally below the head which attracts *-ka*, as we just discussed. In order to account for the contrasts in (28) and (29), we need a derivation in which *-koso* is attracted first, but if *-ka* movement is overt and *-koso* movement is covert, how could this be?

There is a way out of this paradox if we suppose, following proposals made by Bobaljik (1995), Pesetsky (1998), Chomsky (1998), that the derivation proceeds in a single cycle. In other words, it is not the case that all overt movement precedes all covert movement, but rather that all movement lower in the tree (whether "overt" or "covert") precedes all movement higher in the tree. If this were the case, we would expect *-koso* to be attracted first, since, as we concluded above, $H_{koso}°$ must be structurally below the head which attracts *-ka*. Thus, at the point where F_I is attracted to $H_{koso}°$ in (30), *-ka* would still be in its launching site and thus still in a position to intervene. Only afterwards would *-ka* be moved to its final location, a movement which incidentally would turn out to be overt.

Reviewing and clarifying the proposal: (a) *-koso* and *-ka* share a feature F_I, (b) *-koso* must move to a clause-level projection lower than the landing site of *-ka*, and (c) the movement of *-koso* is driven by attraction of the feature F_I. In addition, we must suppose

[22] A technical point about (28b): We must assume that Q cannot be left behind when *nani* scrambles over the subject. This is yet another case for which we need to appeal to the stipulation from chapter 3 that Q cannot be "stranded" in Japanese.

that (d) *-ka* has some other feature F_2, and (e) the movement of *-ka* is driven by attraction of the feature F_2.[23]

To illustrate, let us run through the derivation of the sentences from (28). In these example derivations, I have again labeled the head which attracts *-ka* as $H_{ka}°$ and the head which attracts *-koso* as $H_{koso}°$. Also note that linear order reflects hierarchy (not surface order), with the leftmost elements being structurally highest.

The derivation of (28a) is illustrated in (31).

(31) a. $[_{HkaP}\ H_{ka}°\ [_{HkosoP}\ H_{koso}°\ [$ ... J-koso nani-ka yonda ...
$\uparrow$ (F_1) *covert*

b. $[_{HkaP}\ H_{ka}°\ [_{HkosoP}$ koso$_i$ $H_{koso}°\ [$ ... John-t_i nani-ka yonda ...
$\uparrow$ (F_2) *overt*

In (31a), the lower head ($H_{koso}°$) attracts the feature F_1, and *-koso* moves, being the closest thing that has the required feature (*-ka* also has it, but *-ka* is not as close to $H_{koso}°$). In the second step, illustrated in (31b), the higher head attracts a feature F_2, causing *-ka* to move (since *-ka* carries F_2, but *-koso* does not). With *-ka* moved to $H_{ka}°$ and *-koso* moved to $H_{koso}°$, the derivation converges.

By contrast, when the *wh*-word and *-koso* are in the reverse order (28b), the derivation proceeds as shown in (32). First (32a), the lower head ($H_{koso}°$) attracts the feature F_1, but *-ka* (not *-koso*) is the closest thing with F_1. So, *-ka* moves to $H_{koso}°$.[24] Then, in (32b), the higher head attracts a feature F_2 (that *-ka* has but *-koso* lacks), and so *-ka* moves—again—to $H_{ka}°$.

(32) a. $[_{HkaP}\ H_{ka}°\ [_{HkosoP}\ H_{koso}°\ [$... nani ka J-koso yonda ...
$\uparrow$ (F_1)

b. $[_{HkaP}\ H_{ka}°\ [_{HkosoP}\ H_{koso}°$-ka$_i$ [... nani t_i J-koso yonda ...
$\uparrow$ (F_2) ✳

Assuming that *-koso* must be associated with $H_{koso}°$ for interpretation,[25] we expect (32) to be ill-formed, since the *-koso* particle is never associated with the $H_{koso}°$.[26]

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[23] The account of *-koso* given here is essentially the same as the one I proposed in Hagstrom (1998), but there has been a crucial change in how I treat *wh*-words. While in the previous analysis all of the potentially conflicting movement was covert, in the present analysis *-ka* movement in questions is overt, while the feature attraction relevant to *-koso* is covert. Thus, while the analysis in Hagstrom (1998) did not require a "single-cycle" view of the derivation, the present account does.

[24] It is possible in fact that the derivation crashes right here, if *-ka* is in some way incompatible with $H_{koso}°$. If so, then it doesn't matter whether *-ka* would move again to $H_{ka}°$.

[25] We might suppose that failure to move *-koso* to $H_{koso}°$ leaves a feature unchecked, crashing the derivation at the interface.

The examples we have seen above provide strong evidence that the ordering restrictions on *-koso* are based on structural intervention effects like those we saw in chapter 2. This is contrary to the account provided by Tanaka (1997b); Tanaka attributes the restrictions to crossing dependencies (e.g., between *wh*-words and CP, between *-sika* and NegP, and between *-koso* and a focus phrase). However, we have seen that even "self-contained" instances of *-ka* or *-mo* (e.g., in quantifiers like *dareka* 'someone' or disjunctions like *John-ka Bill* 'John or Bill') intervene for *-koso*-movement. There is no dependency between these elements and any clause-level functional projection, and therefore the ill-formedness of cases like (22) (with *dareka*) cannot be explained by appealing to crossing dependencies; the only dependency in such cases is the movement chain of *-koso*.

We can conclude, based on what we have seen in this section, that *-koso* is in a movement relation with a clause-level functional projection lower than the functional projection to which *-ka* moves in questions. We can also conclude that the movement of *-koso* is driven by attraction of a feature which is shared by the morphemes *-ka* (and *-mo*), which gives rise to the complex intervention effects reviewed above.[27] Crucial to make the mechanics work was the assumption that the derivation proceeds in a single cycle, such that in principle certain covert movements can take place prior to other overt movements.

4. A crosslinguistic difference in the properties of *wh*-islands

We observed in chapter 2 that in Sinhala, a question with an embedded interrogative complement cannot have the question marker *də* inside the *wh*-island (33a), although it is allowed just outside the island (33b).

(33) a. ?* Ranjit [Chitra **monəwa də** kieuwa **də-næddə** kiyəla] danne?
Ranjit Chitra **what Q** read **whether** that know-E
('What does Ranjit know whether Chitra read?')

b. ? Ranjit [Chitra **monəwa** kieuwa **də-næddə** kiyəla] **də** danne?
Ranjit Chitra **what** read **whether** that **Q** know-E
'What does Ranjit know whether Chitra read?'
(Kishimoto 1997:33,40, Dileep Chandralal, p.c.)

Notice one important characteristic of the good case in (33b), however: *də* is outside of *kiyəla*, which is not where *də* appears when it moves to the clause periphery under a verb like *dannəwa* 'know', as we see in the data in (34) (repeated from chapter 1).

(continued...)

[26] Tanaka (1997b) also discusses examples involving *-koso* attached to a *wh*-word (e.g., *nani-koso*). These are not completely accounted for under the analysis presented here without some additional assumptions. A full proposal must be left for another time.

[27] I will not confront the question of what the features F_1 and F_2 actually *are*, since it does not matter mechanically. The answer to this question might become clearer once a semantics for *-koso* is properly worked out. F_2, the feature attracted in order to move Q, is presumably the feature responsible for the Sinhala 'E' morphology (and its analog in Okinawan and premodern Japanese). F_1, on the other hand, is presumably connectable in some way to the special *musubi*-marking *-koso* required in premodern Japanese.

(34) a. Ranjit [**kau də** aawe kiyəla] dannəwa.
Ranjit **who Q** came-**E** that know
'Ranjit knows who came.'

b. Ranjit [**kauru** aawa **də** kiyəla] dannəwa.
Ranjit **who** came **Q** that know
'Ranjit knows who came.' (Kishimoto 1997:6–7)

In Japanese, it has been widely observed (e.g., by Nishigauchi (1990) and Watanabe (1992a)) that *wh*-words inside of *wh*-islands are not well-formed (e.g., (35)). Thus, it appears that whatever allows Sinhala to have *wh*-words inside *wh*-clauses (e.g., launching Q from outside 'whether' as in (33b)) is not an option in Japanese.

(35) ?* John-wa [Mary-ga **nani**-o yonda **ka-dooka**] sitteiru **no**?
John-TOP Mary-NOM **what**-ACC read **whether** know **Q**
'What does John know whether Mary bought t?' (Kishimoto 1997:47)

In terms of the discussion from section 1 of this chapter, this suggests that in Sinhala, Q can "migrate" to a position outside of 'whether' while in Japanese it cannot.

We also saw in chapter 2 that this position outside *kiyəla* was available as an attachment site for *də* in the complement of non-bridge verbs, allowing cases like (36) and (37), repeated from chapter 2. In these examples, we see that this post-*kiyəla* position for *də* seems to be available both for bridge verbs and for non-bridge verbs

(36) a. Ranjit [Chitra **mokaa**-ṭə gæhuwa kiyəla] **də** kiiwe?
Ranjit Chitra **what**-DAT hit that **Q** said-**E**
'Ranjit said that Chitra hit what?'

b. Ranjit [Chitra **mokaa**-ṭə-**də** gæhuwa kiyəla] kiiwe?
Ranjit Chitra **what**-DAT-**Q** hit that said-**E**
'Ranjit said that Chitra hit what?' (Kishimoto 1992:59)

(37) a. Chitra [Ranjit **monəwa** gatta kiyəla] **də** kendiruwe?
Chitra Ranjit **what** bought that **Q** whispered-**E**
'Chitra whispered that Ranjit bought what book?' (~Kishimoto 1997:40)

b. ?? Chitra [Ranjit **monəwa də** gatta kiyəla] kendiruwe?
Chitra Ranjit **what Q** bought that whispered-**E**
'Chitra whispered that Ranjit bought what book?' (Kishimoto 1997:33)

As before, Japanese seems to lack the clause-external position from which to launch Q, leading to the observed ill-formedness of (38a) below. Put another way, Japanese (38a) is structurally parallel to Sinhala (37b); somehow, the structure in (37a) is prohibited in Japanese.

(38) a. ??? Taroo-wa [Mary-ga **nani**-o nusunda to] **sakenda** no?
Taroo-TOP Mary-NOM **what**-ACC stole that **shouted** Q
('What did Taroo shout that Mary stole?')

b. Taroo-wa [Mary-ga **nani**-o nusunda to] **omotta** no?
Taroo-TOP Mary-NOM **what**-ACC stole that **thought** Q
'What did Taroo think that Mary stole?' (Shigeru Miyagawa, p.c.)

In terms of the availability of Q-migration, we saw in section 1 that Q seems only able to migrate at *island* boundaries.[28] The Sinhala examples (33b), (36a), and (37a) seem to show Q migrating to a position just outside the complementizer *kiyəla*. This suggests that the "*wh*-islands" with *dəæddə kiyəla* 'whether that' in Sinhala are actually *islands*. That is, movement cannot occur across their boundary, and hence *də* must migrate to the edge.[29] On such an explanation, what makes Japanese different is that "*wh*-islands" with *kadooka* are not really islands. Rather, the ill-formedness of "*wh*-island violations" in Japanese is simply the intervention effect caused by *-ka* having to be attracted over the intervenor *kadooka*. As mentioned earlier (in footnote 6 as well as at the end of chapter 3), this view suggests that (at least some intervening component of) *kadooka* is actually structurally *below* the complementizer. Then, C attracts *-ka* (because *-ka* moves successive-cyclically), and this movement crosses *kadooka*. This will always rule out structures in which *-ka* launches from inside a clause with *kadooka* as intervention effect violations.

In support of the idea that "*wh*-islands" with *kadooka* are not movement islands in Japanese (specifically, not of the sort that might allow Q-migration), note that scrambling is allowed out of "*wh*-islands" with *kadooka* (39) but not out of strong islands of the sort we have seen allow Q-migration (40).[30]

(39) LGB-o_i Hanako-ga [John-ga t_i yonda kadooka] tazuneta.
LGB-ACC Hanako-NOM John-NOM read whether asked
'LGB_i, Hanako asked whether John read t_i.'
(Miyagawa class handout, Spring 1998)

(40) a. * hon-o_i Taroo-ga [Hanako-ga t_i katta mise]-ni itta.
book-ACC Taro-NOM Hanako-NOM bought store-to went
('A $book_i$, Taro went to the store where Hanako bought t_i.')
(Shigeru Miyagawa, p.c.)

b. ?? sono hon-o_i John-ga [Mary-ga t_i yomioete kara] dekaketa.
that book-ACC John-NOM Mary-NOM finish.reading after went.out
('That $book_i$, John went out after Mary finished reading t_i.')
(Saito 1985:247)

If this view of the difference between Sinhala and Japanese is on the right track, it suggests that languages can differ with respect to whether *wh*-islands are strong islands or not. Ironically enough, if a language has strong *wh*-islands (like Sinhala), *wh*-words will

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[28] A caveat: This will be slightly revised in chapter 8, but not in a way which affects this point.

[29] This runs us into a bit of trouble if (33b) is perfect, because given our proposal that Q must move successive-cyclically, Q should have been attracted by the C represented by *kiyəla*. Dileep Chandralal (p.c.) tells me that (33b) is "not perfect" but is better than (33a). Perhaps this means that (33) is parallel to the Japanese case from (5) in section 1. That is, (33b) shows an intervention effect and (33a) shows an island effect. More investigation is required before any firm conclusions can be drawn.

[30] Thanks to Shigeru Miyagawa (p.c.) for calling my attention to this.

be allowed inside them (since Q can migrate to the edge), whereas if a language has weak *wh*-islands (like Japanese), *wh*-words will not be allowed inside them (since Q will always be attracted by C past 'whether').[31]

5. Malay

Question formation in Malay has unusual and interesting properties which make it an interesting place to attempt to extend the analysis proposed in the previous chapters. In Malay, *wh*-questions can be asked by leaving the *wh*-words in situ (as is familiar from the languages we have been looking at), but it is also possible to move the *wh*-words. Interestingly, the "*wh*-movement" need not proceed all the way to the scope position; it is possible to move a *wh*-word only partway to the scope position. However, when a *wh*-word is "partially moved" in this way, no islands can intervene between the overt position of the *wh*-word and its scope position. Saddy (1991) was the first to describe this phenomenon in these terms (for Bahasa Indonesia [Indonesian], a closely related and mutually intelligible language), and it has also been discussed by Cheng (1991) (again for Bahasa Indonesia), Cole & Hermon (1994, 1997), and Richards (1997).

The basic facts are as follows. A *wh*-word may stay in situ, as in (41a), or it may be moved to its scope position, as in (41c). In cases where a clause boundary intervenes, as in (41b), the *wh*-word can stop partway to its scope position. All three questions in (41) can have a matrix question interpretation, and (41b) can also have an embedded question interpretation.

(41) a. Ali memberitahu kamu tadi [Fatimah baca **apa**]?
Ali informed you just.now Fatimah read **what**
'What did Ali tell you just now Fatimah read?'

b. Ali memberitahu kamu tadi **apa**$_i$ (yang) [Fatimah baca t_i](?)
Ali informed you just.now **what** YANG Fatimah read
'What did Ali tell you just now Fatimah read?'
'Ali told you what Fatimah was reading.'

c. **apa**$_i$ (yang) Ali beritahu kamu tadi [Fatimah baca t_i]?
what YANG Ali informed you just.now Fatimah read
'What did Ali tell you Fatimah was reading?' (Hooi Ling Soh, p.c.)

When a *wh*-word is moved, it is often optionally followed by the morpheme *yang*; the precise characterization of the environments in which *yang* appears is complex and won't be addressed satisfactorily here.[32] Among other places, *yang* occurs connecting a relative

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[31] There is a predication this makes about Sinhala which I have not yet tested. In Sinhala, it is possible to scramble, just like in Japanese. The prediction the view espoused in this section makes is that scrambling out of *wh*-islands and out of adjunct islands should be equally bad in Sinhala, unlike the cases in (39) and (40) in Japanese.

[32] Among the complications concerning *yang* is the fact that a certain class of *wh*-words (including *kenapa* 'why', *bagaimana* 'how', *di mana* 'at where') are fronted without *yang*. A subclass of these *wh*-words (including *kenapa* and *bagaimana* but not *di mana*) *must* be fronted, and are ill-formed in situ. I do not have an analysis for these facts, but there are potential correlates in Sinhala and Japanese. In Japanese, *naze*

(...continues) ➡

clause to its the head noun and sometimes occurs in a complementizer-like role embedding clauses.[33] Another aspect of the morphology worth pointing out is that transitive verbs often have a prefix *meng-* (which assimilates to the following consonant), but this prefix disappears if an argument moves past it overtly; thus, in (41c), *memberitahu* 'informed' becomes *beritahu* because *apa* 'what' has moved past it.

The overt movement of a *wh*-phrase is, as we would expect, constrained by islands. Thus, it is not possible to move a *wh*-phrase out of a complex noun phrase island (42) or an adjunct island (43). It is, however, possible to leave a *wh*-word in situ in these contexts, as the (b) examples show.

(42) a. * **dengan siapa**$_i$ kamu sayang [perempuan yang telah berjumpa t_i]?
with who you love woman YANG already met
('Who do you love the woman that already met *t*?')
(Cole & Hermon 1997:8)

b. kamu sayang [perempuan yang telah berjumpa **siapa**]?
you love woman YANG already met **who**
'Who do you love the woman that already met *t*?' (Cole & Hermon 1997:9)

(43) a. * **apa**$_i$ (yang) Ali dipecat [kerana dia beli t_i]?
what YANG Ali was.fired because he bought
('What was Ali fired because he bought *t*?') (Cole & Hermon 1997:8)

b. Ali dipecat [kerana dia beli **apa**]?
Ali was.fired because he bought **what**
'What was Ali fired because he bought *t*?' (Hooi Ling Soh, p.c.)

Perhaps surprisingly, for a *wh*-word that is to take scope outside of an island, if the *wh*-word is moved even *internal* to an island the result is ungrammatical. This is illustrated in (44); here, the *wh*-word is inside a complex noun phrase. The question is fine if the *wh*-word is left in situ (44a), but if it is fronted at all the result is bad (44b). Notice that the movement of the *wh*-word in (44b) did *not* cross the island boundary.

(44) a. kamu sayang [perempuan yang Ali fikir [yang telah makan **apa**]]?
you love woman YANG Ali thinks YANG already ate **what**
'What do you love the woman that Ali thinks ate *t*?'

b. * kamu sayang [perempuan yang Ali fikir [**apa**$_i$ yang telah makan t_i]]?
you love woman YANG Ali thinks **what** YANG already ate
('What do you love the woman that Ali thinks ate *t*?')

(continued...)
'why' is ill-formed inside islands (with a certain kind of exception; see Saito 1994) and in Sinhala, *æi* 'why' is impossible inside islands. We also noted in chapters 1 and 2 that with a certain class of *wh*-words in Sinhala (including *kiidenek* 'how many'), overt movement of *də* to the clause periphery was optionally possible. Hopefully, future research will be able to tie these similar-looking phenomena together coherently.

[33] These roles for *yang* make it tempting to try to draw an analogy with the adnominal agreement in the *kakari-musubi* constructions of premodern Japanese and modern-day Okinawan. Beyond pointing out the possibility of a parallel, however, I will not explore this analogy here.

The generalizations about Malay *wh*-words appear to be as in (45).

(45) GENERALIZATIONS about Malay *wh*-words
A *wh*-word in situ is well-formed inside an island.
A *wh*-word inside an island cannot move.

How can we understand this in terms of the analysis we have been developing over the course of the last few chapters?

In Malay, 'Q' does not appear to have any overt realization (at least in the questions we have seen so far; cf. footnote 36 below). As in the other languages we have discussed, we expect that Q needs to move in questions to reach the clause periphery. Since *wh*-words (in situ) are allowed inside islands, it must be the case that Q can be launched from outside of these islands (as in Japanese, Sinhala, and Okinawan) in order that the movement of Q to the clause periphery not cross any island boundaries.

To derive the data with respect to *wh*-word movement, however, it must be the case that when a *wh*-word moves, the option of launching Q from outside the island disappears. This is somewhat analogous to the use to which we put *ittai* '...in the world' in Japanese back in chapter 2; just as island-internal *ittai* implies that Q (*-ka*) launches from inside the island in Japanese, so does island-internal *movement* imply that Q had to launch from inside the island in Malay.

This result would follow if the overt movement of the *wh*-word makes crucial use of Q; for example, we might suppose that overt movement of the *wh*-word is caused by attraction of a feature of Q.[34] We can spell this out as follows: the fronting construction attracts a feature which the *wh*-word itself does not carry, but which Q *does* carry. That is to say, the only thing that *can* be fronted is Q (carrying with it the phrase to which Q is attached).

In fact, this looks similar to the "pseudo-cleft" cases we have seen in Sinhala, where a focused constituent or a Q-marked *wh*-word is right-dislocated. In such cases, it is not possible to move just the *wh*-word or the focused element without also bringing along the focusing particle.[35]

(46) a. Chitra e_i gatte [mokak **də**]$_i$? (*Sinhala*)
Chitra bought-E what **Q**
'What was it that Chitra bought?'

b. * Chitra e_i **də** gatte mokak$_i$?
Chitra **Q** bought-E what
('What was it that Chitra bought?') (Dileep Chandralal, p.c.)

(47) a. Chitra e_i gatte [potə **tamayi**]. (*Sinhala*)
Chitra bought-E book **EMPH**
'It was a book that Chitra bought.'

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[34] In fact, maybe it is attraction of "F_i", posited as a feature of Q in section 3.

[35] (47b) unsurprisingly has a reading something like 'It was Chitra that bought the book', but not the reading indicated, in which the focus of *tamayi* has been extraposed.

b. * Chitra e_i **tamayi** gatte potə$_i$.
Chitra **EMPH** bought-E book
('It was a book that Chitra bought.') (Kumara Henadeerage, p.c.)

If we suppose that it is the Q or focus particle which is being attracted in the cases above, then we also expect that anything that the Q or focus particle can attach to (since we know that at least Q can attach higher up, e.g., outside of an island) can be moved into the focus position. In Sinhala, this prediction seems to be borne out; as we see in (48), an entire *də*-marked CNP-island can be right-dislocated into the focus position, yet no piece of it can be extracted to focus position (since that is of course movement out of an island).

(48) a. oyaa e_i hoyanne [**kauru** horəkankərəpu baḍuvagəyak **də**]$_i$?
you look.for-E **who** stolen thing **Q**
'Who are you looking for things *t* stole?'
(~Sumangala 1992:141)

b. * oyaa [e_i horəkankərəpu baḍuvagəyak] hoyanne [**kau** **də**]$_i$?
you stolen things look.for-E **who** **Q**
('Who are you looking for things *t* stole?')
(Sumangala 1992:140)

If the analogy between movement of *wh*-words in Malay and this right-dislocation of *wh*-phrases in Sinhala is appropriate, then we also expect a similar phenomenon in Malay. Specifically, we know that a *wh*-word cannot move to a focus position within an island, and we attribute that to the fact that it is Q which causes focus movement and Q has to be outside the island to be grammatical. It might, however, be possible to move a whole island into focus position if Q actually attaches just outside of islands in Malay.[36]

In (49), we see that this looks right. (49a) has the *wh*-word in situ, which is fine. In (49b–c), the *wh*-word has been moved, and of course the examples are ungrammatical. In (49d), the whole island (which caused the trouble in (49b–c)) is fronted with the island-internal wh-word in situ. Although (49d) may be slightly marginal, it is reportedly significantly better than (49b–c).

(49) a. dia dipecat [sebab dia membeli **apa**]?
he was.fired reason he bought **what**
'What was he fired because he bought *t*?'

b. * dia dipecat [sebab **apa**$_i$ dia beli t$_i$]?
he was.fired reason **what** he bought
'What was he fired because he bought *t*?'

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[36] The appearance of *-kah* in this example suggests that 'Q' may have overt phonological realization in certain cases. I believe that *-kah* appears in other cases of "pied piping" as well. *-kah*, like Sinhala *də*, may also be able to delimit disjunctive alternatives in an alternative question in colloquial Malay. In (i) below, it appears reduced to *kə*, but it is (according to speaker intuition) the same particle as *-kah*.
(i) awak nak beli baju ini **kə** baju itu?
you want buy shirt this **or** shirt that
'Do you want to buy this shirt or that shirt?' (Hooi Ling Soh, p.c.)

c. * **apa**$_i$ (yang) dia dipecat [sebab dia beli t_i]?
what YANG he was.fired reason he bought
('What was he fired because he bought *t*?')

d. ? oleh [sebab dia membeli **apa**]$_i$-kah (yang) dia dipecat t_i?
by reason he bought **what**-Q YANG he was.fired
'What was he fired because he bought *t*?'
(Solakhiah Januri, Hooi Ling Soh, p.c.)

We have seen in this section a sketch of a partial analysis which applies our general approach to Malay. Many details remain to be addressed, of course, but the outlook is at least promising.

Chapter 5 A semantics for single questions and indefinites

Maybe in order to understand mankind, we have to look at the word itself. *Mankind*. Basically, it's made up of two separate words—"mank" and "ind." What do these words mean? It's a mystery, and that's why so is mankind.
—Jack Handey, *Deeper Thoughts*.

The bulk of the early chapters was devoted to investigating the syntactic properties of the morpheme *-ka* in Japanese (and *də* in Sinhala, *-GA* in Okinawan, etc.). One conclusion we reached is that it is reasonable to consider the occurrences of *-ka* in (1a) and (1b) to be instances of the same fundamental morpheme.

(1) a. John-ga nani-**ka**-o kaimasita.
John-NOM what-**Q**-ACC bought
'John bought something.'

b. John-ga nani-o kaimasita **ka**?
John-NOM what-ACC bought **Q**
'What did John buy?'

A primary goal of the next few chapters will be to explore a way to assign a consistent semantic contribution to the *-ka* morpheme. The hope is to find a single meaning which will participate both in the semantics of indefinites like in (1a) and in questions like in (1b).

1. Questions as sets of propositions

Pinning down the semantics of a "question" is a far from simple task. Even if we had a satisfactory idea of what constitutes a "statement," the relationship between a statement and a question is not so obvious.

Let us work up from some (oversimplified) intuitions about this problem. We feel that a statement like (2) has a truth value; it is true if Homer broke the toaster, and it is false if he did not break the toaster.

(2) Homer broke the toaster.

It has other properties as well, which raise a wide variety of philosophical and analytical problems that we will set aside for the moment. For instance, uttering (2) presupposes that there is a unique toaster in the discourse environment to which the speaker refers and that Homer is the sort of animate agent that can be responsible for a breaking of something, and that the toaster was previously functional. A statement whose presuppositions are not met (in this example, the statement (2) in a world in which Homer is an inanimate carbon rod and which contains nothing else but sand) seems to be neither true nor false. Acknowledging the existence of these issues, however, let us take seriously the intuition that a statement has a truth value.

Consider (3) by contrast.

(3) Who broke the toaster?

This utterance does not seem to have a truth value, but it is a request for a response of a certain kind. In particular, it is a request for a true statement, for example, a statement like (2) might be such a statement.

Notice also that we have the intuition that (4) is not the sort of statement that a person uttering (3) is after.

(4) It always rains on the Fourth of July.

That is, we feel that the question in (3) conveys certain information about what form an answer will take, information which tells us that (2) constitutes an answer while (4) does not.

We must be careful with the terminology *constitutes an answer*, of course, since it is not necessarily true that what is uttered in response to a question must itself constitute an answer for it to be cooperative and appropriate in the discourse. For example, we could easily imagine that (5) can serve as a response to the question (3), even though it is almost certain that we do not want to count (5) as *constituting an answer* to (3). Rather, the intuition is that we can *deduce* the answer to (3) from (5).

(5) Everyone but Homer is out of town.

Hamblin (1958) attempts a formalization of the intuitions we have been discussing by proposing "postulates" including the two in (6).

(6) Postulates (Hamblin 1958:162)
I. An answer to a question is a statement.
II. Knowing what counts as an answer is equivalent to knowing the question.

Postulate I says that (given a question and answer), it will turn out that the answer is a statement. Hamblin's reason for introducing this is to exclude sentence *fragments* from the domain of possible answers. That is, even if it is appropriate to answer *What is your name?* with a fragment like *Inigo Montoya*, Postulate I states that this fragment must be elliptical for the complete statement (which we can recover).

Postulate II is at the heart of the approach to questions which we will adopt here. It attempts to capture the intuition of what has been communicated when a question is asked. It states that a question (which we can identify by some other means) will turn out to be a specification for the type of answer being sought after. To understand a question (that is, to know what question is being asked, or, as Hamblin puts it, to "know the question") is to be able to segregate statements into "possible answers" and "impossible answers." A question, then, serves to specify the set of "possible answers."

These postulates do not make any sense unless we also have some independent criterion by which we can *identify* a "question" and an "answer." Hamblin seems to implicitly assume that such identifications can be made, but the only clue he gives is to say that "if pressed to define a question, I should do so by saying that it is a sentence which requires an answer; or (I should hastily add) a refusal to answer, or the raising of a point of

order" (Hamblin 1958:161). The suggestion seems to be that a question can be identified by its effect on discourse, a question being an utterance which requires a response in a well-formed discourse. However, the task of defining a question will not be easy in these terms.[1] For example, we intuitively want to classify an imperative like *Tell me the topic of your thesis* as something other than a question,[2] although it seems to have nearly the same discourse effect as a question like *What is the topic of your thesis?* This alone should be enough to warn us that the attempt to *define* a question will be a complicated matter. Because this is in fact peripheral to the main points we wish to address in this thesis, let us concede this point and take the identification of questions (and answers, the responses which questions elicit) as part of the given information. That is, we will assume that a question and an answer *can* be identified in some independent way. Once we have a question-answer pair, we can use Hamblin's postulates.[3]

Of course, this still falls short of a complete characterization of understanding a question without some notion of what constitutes a "possible answer." This was the issue we were discussing surrounding the use of (5) as an answer to (3). There is an intuition about the sort of answers that (3) demands that includes (2) but excludes (5); put another way, the answer must be a statement expressible in the form *x broke the toaster*, where *x* is a person. (2) is such a statement, while (5) is not. It seems that (5) is an appropriate answer to the question, but our intuition is that it is only an appropriate answer if it is possible to reason *from* the statement in (5) *to* a statement of the form *x broke the toaster*, where *x* is a person. That is, there is an intuition about questions that an appropriate answer is connected by (perhaps vacuous) inference to a statement of a specific form. Let us suppose that what "possible answer" should refer to is statements of this specific form, e.g. *x broke the toaster* for (3).[4]

Hamblin (1973) casts the spirit of Postulate II into a formal semantic framework in which an utterance is assigned a semantic representation. Here, we will often refer to the semantic representation as the "semantic value," which is the result of applying the evaluation function ⟦ ⟧ to the utterance. Hamblin's (1973) proposal was, in essence, that the semantic value of a question is the set of its possible answers.

Up until now, the discussion has been valid only for matrix questions, but it is also possible to embed sentences which look like questions under verbs like *know*, *ask*, *tell*, *wonder*, etc., as in (7). Notice that if we wish to classify matrix and embedded questions together, this further undermines a "discourse effect" means of identifying a question.

(7) a. I know who broke the toaster.
b. I wonder who broke the toaster.

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[1] Thanks to Noam Chomsky (p.c.) for clarifying these points for me.

[2] Actually, Hamblin (1958:159) himself seems not so sure of this point; with reference to the utterance *Tell me how many fingers I am holding up!*, he writes that it is "a command, but at least almost equally well considered as a question."

[3] We are also limiting our discussion to information seeking questions and informative answers. This excludes echo questions, rhetorical questions, questions answered by a question, and so forth.

[4] Note that this excludes answers like *The toaster was broken by Homer* or *It was Homer who broke the toaster* from the set of possible answers for (3), since neither of these statements are of the form *x broke the toaster* for a person *x*. Of course, the chain of reasoning by which one could deduce (2) from either of these statements is presumably not very complicated.

Embedding a question like (3) under *I know*, as in (7a), seems to implicate at least that if *Homer broke the toaster* is true, then *I know that Homer broke the toaster.*[5] More generally, if I know who broke the toaster, then for statements of the form *x broke the toaster* (where *x* is a person), if a statement is true then I know that the statement is true. Embedding the question under *I wonder*, as in (7b) means (intuitively) that I wonder which of the statements of the form *x broke the toaster* is true. We can see that, even without working out a specific semantics at this point, the idea that the embedded questions in (7) have a set of propositions (of the form *x broke the toaster*) as their denotation seems to match reasonably well with the intuitions of what these sentences mean.

2. Some basic assumptions about semantic composition

> I think there probably should be a rule that if you're talking about how many loaves of bread a bullet will go through, it's understood that you mean lengthwise loaves. Otherwise it makes no sense.
> —Jack Handey, *Deepest Thoughts*

Before getting too far into the details of the semantic analysis of questions that will occupy us for the remainder of this chapter, we will take a (very brief) moment to outline some of the assumptions we will be adopting about semantic interpretation and its connection with the syntax. For a more complete introduction to these concepts, see, e.g., Heim & Kratzer (1998) and Gamut (1991).

The most fundamental assumption we will make is that the semantic interpretation is *compositionally* derived from the structure provided by the syntax. To illustrate the basic concepts, consider (8) below.

(8) a. John left

b. $[\![\text{ left }]\!](x) = 1$ iff x left.

c. $[\![\text{ left }]\!] = \lambda x[\text{ left}'(x)]$

Assuming that the constituency of the English sentence (8a) can be approximated by treating *John* and *left* as sisters, we can evaluate the truth conditions of (8a) by using the definition of $[\![\text{ left }]\!]$ (the semantic value of *left*) given in (8b), alternatively expressed as in (8c). In (8b), the semantic value of *left* is a function which takes an individual argument and returns 1 ("true") if the individual left. I will use "left'" to metalinguistically notate the lexical meaning of *left*.

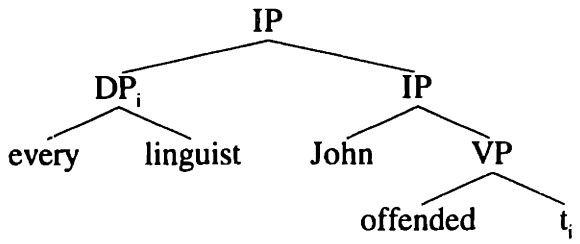
I will notate the semantic type assigned to (model-theoretic) individuals as <e>, and the semantic type of truth values as <t>. Because $[\![\text{ left }]\!]$ is a function from individuals (type

[5] I am brushing aside the hard questions about "opacity"; that is, if, for example, Homer is Margaret's father, and I know that Margaret's father broke the toaster, but I don't know that Homer is Margaret's father, the *de dicto* interpretation of *I know Homer broke the toaster* is false. Many issues, both tangential and crucial, arise here, which must be left for future thought (thanks, however, to Noam Chomsky, p.c., for making me aware of the problems involved).

<e>) to truth values (type <t>), the type of ⟦ left ⟧ is written as <e,t>. Where no ambiguity is introduced, I will omit noncrucial punctuation in this notation, hence the type of one-place predicates like ⟦ left ⟧ will generally be referred to as <et>. In general, the assumptions I make here are those outlined in Heim & Kratzer (1998). In particular, I will assume that in *all* cases (at least to a good first approximation) whenever two semantically contentful elements are in a sisterhood relation in the syntactic structure, one is a function which takes the other as an argument.[6]

Since at least May (1977), it has been a common assumption that in sentences which contain quantificational phrases like *every linguist*, there is a syntactic movement referred to as Quantifier Raising ("QR"). Looked at in terms of semantic compositionality, this movement can be considered to be in some sense semantically motivated; this is because the type of a quantifier cannot be the same as the type of an individual, yet quantifiers appear in argument positions which are occupied in other sentences by individuals. I follow Heim & Kratzer (1998) in assuming that the "type mismatch" which arises in such cases is repaired by QR as follows.[7] QR moves the quantifier to a position outside the predicate (e.g., to adjoin to IP), leaving a bound variable in its base position. This bound variable (syntactically, its trace), is of type <e> and is therefore appropriate as an argument. The operation of QR is illustrated in (9) below.

(9) a.



b. ⟦ every linguist ⟧ λi [offended′ (John′, i)]

Semantic type-mismatch drives the operation of QR when it would repair the mismatch (as it does in the case above; *every linguist* quantifies over individuals, and the theme argument of *offended* should be an individual. In fact, semantic type-mismatch will be called upon to drive other operations as well (e.g., flexible functional application, introduced in section 5, and type-lifting operations discussed in chapter 7).

Heim & Kratzer (1998:185–8) propose a particular interpretation of movement-created "coindexation" that will be important to the discussion that follows. It is assumed that some principle of chain interpretation identifies the derived and base positions of a movement relation created in the syntax. We can notate the property of "belonging to the

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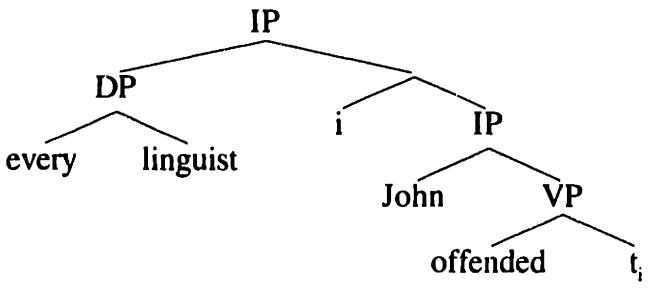
[6] There are cases where more will need to be said; for example, in some cases (probably for relative clauses) we may need to assume that another mode of sister combination is set *intersection* rather than functional application. This issue will not arise in any serious way in this thesis, however.

[7] Pesetsky (1982, ch. 2, sec. 4.2) makes a proposal which seems to be based on the same intuition; there, QR is forced from argument positions because quantifiers are of the wrong *syntactic* category and it is assumed the *trace* of QR has the syntactic category NP—This is nearly a notational variant of the idea that QR is motivated by type-mismatch, leaving a type <e> trace, although the semantic type-mismatch approach that we take here is more general (and its generality will in fact become useful as we invoke QR for quantifiers of types other than <et,e>).

same chain" by coindexation.[8] Semantically, we will interpret movement relations of this kind as causing λ-abstraction in the manner illustrated above. Notice that what is λ-abstracted is the *scope* of the moved constituent. Notationally, Heim & Kratzer (1998) represent this by treating the index as having its own node in the tree; thus, compositionally (9a) is actually more like (9c) below.

(9) c.



We will adopt (9c) as the compositional structure as the convention for the coindexation of movement.[9]

A concept which will come into heavy use is that of the *characteristic function*. In general, a set *A* containing elements of type α can be described in terms of a function from the domain of type-α elements (D_α) to the domain of truth values ($\{0,1\}$), where the characteristic function of the set *A* assigns 1 ("true") to any *a* of type α such that $a \in A$ and 0 ("false") to any other *a*. The characteristic function embodies the membership information of the set *A*. Because the information carried by the set *A* and the characteristic function of *A* are equivalent, we can (and will) speak of sets and characteristic functions interchangeably. That is, any function *f* from D_α to $\{0,1\}$ (which is to say that *f* is of type $<\alpha t>$) can be considered to be a *set* of things of type $<\alpha>$, the set characterized by the function *f*.

Let me also comment on the semantic type of propositions. Because we don't want the semantic content of any two arbitrary true propositions to be evaluated as identical, we need to take "circumstances" into account. That is, a proposition *p* might be true under some circumstances but false in others. What we will assume here is that a proposition is represented as the set of circumstances ("possible worlds") in which the proposition is true.[10] The semantic type of a possible world will be represented as <s> (as is standard in

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[8] This is stated in such a circumlocutory fashion in order to make it clear that it is not necessarily required that indices be syntactically active objects, at least for the purposes under discussion at the moment.

[9] I am treating this as a "convention" in order to avoid making any explicit claims that the "index node" exists in the pre-interpretation syntax. Cresti (1995) cites Reinhart (1983) and Rooth (1985) in connection with this convention as well. Nissenbaum (1998) provides arguments for actually encoding the λ-abstraction in the pre-interpretation syntactic structure based on an analysis of parasitic gap constructions. Shortly, there will be a question related to head movement that will arise, but I suspect the solution I will suggest can be translated into Nissenbaum's assumptions as well.

[10] It is almost certain this representation of propositions (as sets of possible worlds) will not be rich enough to handle propositions with full generality. With few exceptions, we do not make crucial reference to the internal composition of propositions in this thesis, so I set the issue aside. It is probably crucial to what follows that propositions are sets of *something*, particularly to get the type-shifting rules to work, but whether they are sets of possible worlds or something else is not important. However, it is not clear to me that the type shifting rules *couldn't* be reformulated even if propositions were to be composed in some other fashion, but no attempt has been made here.

the literature), making the semantic type of a proposition <st> (the characteristic function of a set of possible worlds).

For convenience, certain semantic types will be abbreviated. For example, I will refer to the semantic type of a proposition, <st>, as <p> wherever it would not cause confusion. Also, rather than attempt any formalization of the lexical semantics of predicates, I will label predicates with their English name and a prime; that is, the meaning of the verb *arrive* will be represented in the semantic formalism as "arrive′".

3. *-ka* as existential quantification over choice functions I: indefinites

As mentioned at the outset, our goal is to provide a coherent semantics for *dare* and for *-ka* that can account for their use both in questions and in indefinites (recall (1)). Because the syntax of indefinites is the simpler of the two, we will begin there. This section will be devoted to working out a preliminary semantics for indefinites like Japanese *dare-ka* 'someone', transparently composed of a *wh*-word, *dare* 'who', and the "question marker" *-ka*. We will concentrate on the Japanese data, although the concepts carry over trivially to the Sinhala examples as well.

Let us consider the intuitive meaning of (10a), whose essence is captured by the paraphrase in (10b).

(10) a. dare-ka-ga kita.
who-Q-NOM came
'Someone came.'

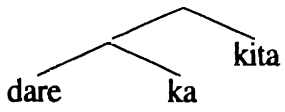
b. There is a person x such that x came.

The paraphrase has two important components which we need to represent. First, there is the existential statement that 'there is an x (such that P(x))' for P=came′. Second, there is the additional restriction that x be a person. We have ample evidence that *dareka* is bimorphemic, containing the *wh*-word *dare* 'who' and the Q morpheme *-ka*. We can assume that the domain restriction on the values for x is a property of the *wh*-word component, simply because substituting a different *wh*-word for *dare*, say *nani* 'what', the semantics remains unchanged except for the restriction on the variable x, which would then be constrained to take on thing-values instead of person-values.

Still thinking in terms of intuitive decomposition of the meaning of (10a), if *dare* contributes the restriction set (e.g., people), *-ka* is plausibly responsible for the variable which *dare* restricts.

Presumably, the constituency of (10a) is roughly as shown in (11). Given that *kita* 'came' takes arguments of type <e> in simple cases (e.g., *John-ga kita* 'John came'), we can suppose that compositionally, in the end, the sister node to *kita* 'came' must be of type <e>. Assuming that the sisters *dare* and *-ka* must combine by function application, the simplest proposal is that *-ka* takes the restriction set *dare* as its argument, yielding something which is of type <e>.

(11)



If *dare* is treated as an argument of *-ka*, and its role is to restrict the argument of *kita* to be individuals of which person′ is true, then we might say that *-ka* is yielding a value that is consistent with the property of being a person. Translating this intuition into formalism, let us suppose that *dare* is the (extensional) property of being human, type <et>, and *-ka* is a function which yields an individual with that property, type <et,e>.[11] What has just been described has been called a "choice function" in recent literature (e.g., von Stechow 1996b, Reinhart 1997, Winter 1997, Kratzer 1997). A predicate of type <et> can be thought of as characterizing a set, namely the set of individuals of which the predicate is true. Treating predicates and sets as equivalent, we define a choice function as in (12).

(12) A function *f* is a *choice function* if it applies to a (non-empty) set and yields a member of that set.

A very simple scenario involving a choice function is illustrated in (13). The set A contains three elements, and a choice function applied to the set A will return one of those three elements. As defined, f_1, f_2, and f_3 each are possible choice functions.

(13) $A = \{a, b, c\}$
$f_1(A) = a$
$f_2(A) = b$
$f_3(A) = c$

Returning now to our analysis of (10a), we can suppose that *-ka* is contributing a choice function, which takes *dare* as an argument, and returns an individual which is in turn taken by *kita* 'came' as an argument, finally resulting in a truth value. This almost derives the meaning we are after; it translates to '*x* came, where *x* is the individual chosen by the choice function *f* from the set of people.' However, the meaning of (10a) is not that the person chosen by some *specific* choice function came; rather, it asserts that *some* choice function *f* can be found such that the person chosen by *f* came. That is to say, we have yet to explain the existential force of *dareka*. The meaning we are after is (essentially) the following:

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[11] There is probably more to this. As this is stated, it is not clear how ⟦ *dare* ⟧ differs from, say, ⟦ *hito* ⟧ 'person', yet we will almost certainly need to distinguish them (since *hito-ka* cannot be used in place of *dare-ka* nor can *hito* be used as a *wh*-word in a *wh*-question). One possibility is that *hito* 'person' is a intensional property (type <ep>) while *dare* 'who' is extensional (type <et>). Another possibility is that there is a real difference between predicates (which are *functions*) and sets (which are not, although they can be *characterized* by functions) in the semantics, and *hito* is a predicate (type <et>) while *dare* is a set (of type <e> elements). It seems that there are already several concepts which have the mathematical structure of sets yet need to be distinguished from one another; for example, plurals are often considered to be (essentially) sets of individuals, but a plural noun is not interchangeable with a one-place predicate, nor should plurals trigger the use of flexible functional application, introduced in section 5 (although they may trigger a similar interpretive process, i.e., the "*" operator for predicate "pluralization"; this will be mentioned again briefly at the end of chapter 6.). I leave these as thoughts in a footnote.

(14) $\exists f$. came′ (f ([[*dare*]]))

One possibility is that the existential force arises through the mechanism of "existential closure," which is assumed to apply to existentially bind variables still free at the point of its application. Thus, if *-ka* represents a choice function *variable*, existential closure over that variable would yield the meaning above. However, we will now see evidence that existential closure is not the source of the $\exists$ in (14).

A primary motivation for the view that indefinites are simply variables without quantificational force of their own is the fact that indefinites exhibit "quantificational variability" (see in particular Heim 1982). That is, indefinites can "pick up" quantificational force from their environment. Consider the sentences in (15). Each contains an indefinite NP in the *if*-clause and a quantificational adverb in the main clause. In each case, the indefinite is interpreted as taking on the quantificational force of the adverb, which we can see from the fact that the sentences in (15) can be roughly paraphrased by the corresponding sentences in (16).

(15) a. *In most cases*, if a table$_i$ has lasted for 50 years, it$_i$ will last for another 50 years.
b. *Sometimes*, if a cat$_i$ falls from the fifth floor, it$_i$ survives.
c. If a person$_i$ falls from the fifth floor, he$_i$ *very rarely* survives.
d. If an article$_i$ is published in LI, John *usually* reads it$_i$.

(16) a. *Most* tables that have lasted for 50 years will last for another 50 years.
b. *Some* cats that fall from the fifth floor survive.
c. *Very few* people who fall from the fifth floor survive.
d. John reads *most* articles that are published in LI.

In Japanese, a similar phenomenon occurs with bare nouns. Japanese does not have an article which corresponds to English *a(n)*, but bare nouns exhibit quantificational variability just like the English indefinites above, as shown in (17).

(17) a. MIT Press-ga ronbun$_i$-o syuppansureba John-ga *taitei* sore$_i$-o yomu.
MIT P.-NOM article-ACC published-if John-NOM *usually* it-ACC read
'If MIT Press publishes an article$_i$, John usually reads it$_i$.'
='Most articles published by MIT Press are such that John reads them.'
(Shigeru Miyagawa, Hidekazu Tanaka, Junko Shimoyama, p.c)

b. Hon$_i$-o saigo-made yonda hito-wa *taitei* sore$_i$-o utte simatta.
book-ACC end-to read person-TOP *usually* it sold ended
'A person who read a book$_i$ to the end usually ended up selling it$_i$.'
='Most books read to the end are sold (by the reader)'
(Nishigauchi 1990:142)

Accordingly, we suppose that Japanese bare nouns, like the English *a(n)*-indefinites, do not have any quantificational force of their own, but simply introduce (restricted) variables into the semantic representation.

In English, indefinites like *someone* behave like the indefinites discussed above, as (18) shows. This suggests that *someone* does not have inherent quantificational force.

(18) a. If someone$_i$ falls from the fifth floor, he$_i$ *very rarely* survives.
b. If something$_i$ is published in LI, John *usually* reads it$_i$.

Compare this effect with sentences like (19), where the quantifier *everything* is used.[12] The result is quite ill-formed.

(19) * If everything$_i$ (submitted) is published in LI, John (usually) reads it$_i$.

Let us take a moment to consider why (19) is ill-formed and how this would follow from the fact that *everything*, unlike indefinites, has inherent quantificational force (and thus is not simply a variable). The symptom of the problem is that the covaluation between *everything* and *it* is not possible. With indefinites, the *someone* in the *if*-clause represents a variable which is bound by the quantificational adverb in the matrix clause. The covaluation between *someone* and *he* in, e.g., (18a), comes about because both are variables bound together by the quantificational adverb *rarely*.[13] The situation is different with *everything*; in order to get covaluation in (19) between *everything* and *he*, *he* (the variable) must be bound by *everything*. In order to do this, *everything* must move (e.g. by QR) to a c-commanding position; but this movement is not possible because *everything* is contained inside a strong island (the *if*-clause). The end result is that (19) is ill-formed because the required configuration cannot be met. Note that the adverb *usually* plays no particular role in the explanation.

The important point is that quantificational variability is a property of simple variables, so we may be able to use it as a diagnostic for "variablehood." In this light, let us turn to consider the Japanese indefinites formed from *wh*-words, such as *nanika* 'something'. In (20), *nanika* 'something' is substituted in place of the bare noun in (17a).

(20) * MIT Press-ga nanika$_i$-o syuppansureba
MIT P.-NOM something-ACC published-if
John-ga *taitei* sore$_i$-o yomu.
John-NOM *usually* it-ACC read
('If something$_i$ is published by MIT Press, John usually reads it$_i$.')
(='Most things published by MIT Press are such that John reads them.')
(Shigeru Miyagawa, p.c.)

We saw that the bare noun in (17a) exhibited quantificational variability. Strikingly, however, *nanika* in the same context does not. (20) is ill-formed on the reading where *sore* 'it' in the consequent is meant to corefer to *nanika* 'something'.[14,15]

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[12] Thanks to Ken Hale (p.c.) for suggesting this type of example.

[13] Incidentally, binding from the matrix clause into the *if*-clause is independently possible, as the examples in (i) show.

(i) a. If his$_i$ parents call, every (sane) student$_i$ will ask for money.
b. If his$_i$ parents call, John$_i$ comes home.

[14] Saito (1998) observed a strange fact about sentences like (20); if the case marker on *nanika* is omitted, the sentence becomes good again. He speculates that a case marking might in some way confer specificity. Under that approach, what makes (20) bad is not the unbindability of *nanika* but rather an incompatibility between being specific and being a bound variable. My own speculation about such cases is that the explanation of the ill-formedness of (20) in the text holds as given, and the well-formedness of the version without the case marker might be due to a structure that might also be extended to the caseless *-mo* phrases

(...continues) ➠

What this suggests is that *nanika* 'something' does not introduce a simple variable to the semantic representation, unlike bare nouns in Japanese. Note also that *nanika* 'something' patterns with *nanimo* 'everything', both of which are ill-formed in this context (parallel to the English example in (19)).[16]

(21) * MIT Press-ga dono-ronbun-mo$_i$ syuppansureba
MIT P.-NOM every-article-ACC published-if
John-ga *taitei* sore$_i$-o yomu.
John-NOM *usually* it-ACC read
('If every article$_i$ is published by MIT Press, John usually reads it$_i$.')
(Junko Shimoyama, Hidekazu Tanaka, p.c.)

This leads us to an important conclusion about *nanika* 'something' in Japanese. Unlike English indefinites, *nanika* is *not* simply a nonquantificational variable. Instead, it seems to have some *inherent* quantificational force, specifically existential quantificational force. In fact, the same seems to be true of multiword *some*-indefinites in English.[17] The status of (22) is presumably comparable to (20) (as to (19) and to (21)).

(22) * If some package$_i$ falls from the fifth floor, it$_i$ rarely survives.

Recall that we entered this discussion in an attempt to discover where the existential quantificational force comes from in the semantic representation (14), repeated below.

(14) $\exists f$. came′ (f (⟦ *dare* ⟧))

The possibility under consideration was that it was a form of "existential closure," and that the choice function *f* was a simple variable. The facts discussed above cast doubt on this view, however, since we saw that *dareka* does not act as if it introduces a simple variable, but rather as if it contributes the existential force itself.[18,19]

(continued...)
that serve as "NPI's" (e.g., *dono hito-mo* 'any man'). The structure I have in mind has *nanika* (without a case marker) serving in some adverbial way to "limit" or "specify" (although basically vacuously as far as I can see) a null pronoun in argument position. That is, in this case *dareka* is not *itself* in argument position. If that *null pronoun* can be interpreted as a variable in the same way that bare nouns can be, Saito's fact can be made to follow. At this point I have no corroborating evidence to offer in favor of this analysis, so I leave it as a speculation for now.

[15] Not everyone seems to agree about (20). A simple explanation might be that those who find (20) to be good on the quantificational variability reading need not drop the case marker to get the effect mentioned in the previous footnote. It is also possible that *taitei* can quantify over events, to yield a reading like 'In most cases, if something is published by MIT Press, John reads it.' There are a number of open questions here, but they must be left for future investigation.

[16] Hidekazu Tanaka (p.c.) tells me that universal quantifiers with *-mo* sound bad in *if*-clauses regardless of whether there is a bound pronoun in the matrix clause. If so, (21) might be simply irrelevant.

[17] Orin Percus (p.c.) observed that English *where* acts like Japanese *wh*-words in that it can be both part of a *wh*-question as well as part of an indefinite *somewhere*. Also *somewhere*, unlike *something* and *someone*, seems to pattern with *some N* and Japanese *nanika*, etc., with respect to having inherent quantificational force.

[18] There is a potential gap in the logic here: We don't have any guarantee that a *choice function* variable is capable of being bound by an adverb like *taitei* 'usually.' In fact, allowing quantificational variability effects over choice functions brings up potentially serious issues, as Orin Percus (p.c.) reminded me. What

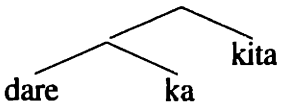
(...continues) ➡

Of course, these indefinites are manifestly bimorphemic (a fact which we made much of in previous chapters), so the next question is: can we isolate the existential force of *dare-ka* in one of its component morphemes? That is, is *-ka* responsible for the existential quantificational force, or is the *wh*-word responsible for it?

The answer to this question is reasonably obvious, considering that *dare-mo* 'everyone' has a different quantificational force, yet appears to contain the same *wh*-word component as *dare-ka* 'someone'. Specifically, we conclude that existential quantification must be an inherent part of the semantic value of *-ka*. The next question is: how does this work out technically?

Repeated in (11) below is the constituency that we used to arrive at the conclusion that *-ka* represents a choice function. However, notice that if *-ka* also contributes the existential force in (14), somehow the existential quantifier must be realized compositionally outside the predicate.

(11)



In fact, we already have a mechanism that has this kind of effect. The mechanism is QR, introduced in section 2. There, it was motivated in terms of repairing a type mismatch between quantifiers like *every linguist* and the individual-type argument that the relevant predicate requires. The idea is that QR moves *every linguist* to adjoin it to a higher projection, leaving behind a trace which is interpreted as a bound variable of type <e>.

As we set up the scene initially, there is no type mismatch in (11), but we don't know that this isn't a *result* of QR. Suppose that *-ka* is of a higher type, a *quantifier* over choice functions. Let us abbreviate the type of choice functions (<et,e>) as <c>, and the type of propositions (<st>) as <p>. Parallel to quantifiers over individuals, we take a quantifier over choice functions to have type <ct,p>, a function from sets of choice functions to propositions (compare to the type of *every linguist*, which is <et,p>, a function from sets of individuals to propositions). We can suppose that this choice function

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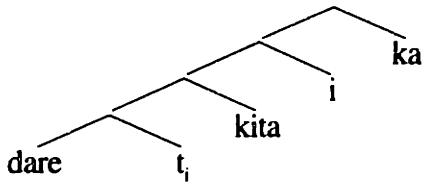
(continued...)

does it mean, for example, to say 'most choice functions applied to the set of *tables over 50 years old* return an individual *x* such that *x* will last another 50 years'? If we allow many differentiable choice functions to pick out the same table, it is unclear how to evaluate *most*. To avoid this problem, we can suppose that choice functions are highly extensional; there are only as many choice functions for a given set as there are members of that set. There may be other issues lurking here as well, but I think they will not seriously undermine the discussion in the text. Even if quantificational variables like *taitai* 'usually' cannot bind choice function variables, we would still assume that existential closure could, which would predict that (20) should not be ill-formed, just that it should lack the quantificational variability reading (i.e. to have an existential reading with *taitei* 'usually' quantifying only over events). The fact that (20) is actually *bad* suggests that the argument in the text above still goes through. But, of course, cf. footnote 15.

[19] A more convincing argument for the inherent quantificational nature of *-ka* (vs. the alternative involving existential closure) would be to show that the existential force is clause-bound, since we would expect that the existential force would be effectively unbounded under an existential closure explanation. Thanks to Orin Percus (p.c.) for pointing this out to me. Ambiguity is reported to arise if *nanika* is scrambled (Hoji 1985), but if it is scrambled beyond a clause boundary, then it must take scope as if it never moved. This is at least consistent, but I'm not sure it is conclusive.

quantifier is moved by means of QR to a position outside the predicate, yielding a structure like (23), leaving a trace behind of type <c>, a choice function, as required.[20]

(23)



Compositionally, (23) is exactly what we need to derive (14). First, *dare*, the set of humans, is taken as an argument to the trace of *-ka*, a choice function (variable). This results in some particular choice of a human individual (type <e>) which can be taken as an argument by the predicate *kita* and mapped to a proposition. The movement index *i* causes λ-abstraction which binds the choice function variable, resulting in a function from choice functions to propositions. It is an "unsaturated proposition" which requires a choice function to become a proposition. This is then taken as an argument of *-ka*.

We are now in a position to outline an explicit hypothesis about the compositional semantics of the components involved in the derivation of (23), which is done below in (24). In (24b), p_c represents an unsaturated proposition of type <cp>.

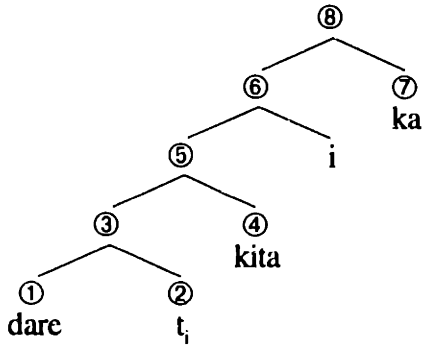
(24) a. $[\![\textit{dare}]\!] = \lambda x.\text{human}'(x)$ <et>

b. $[\![\textit{-ka}]\!] = \lambda p_c \lambda w \exists f.p_c(f)(w)$ <cp,p>

The derivation described above is worked out in more detail below, which shows that the semantic hypotheses in (24) are at least sufficient to handle the case at hand.

[20] This requires assuming that not *all* traces are interpreted as individuals of type <e>. However, notice that the type shift between a quantifier <et,p> and its trace <e> is parallel to the shift between a choice function quantifier <ct,p> and its trace <c>.

(25)



①	λx.human′(x) = WHO	<et>
②	λP.f(P)	<c> = <et,e>
③	f(WHO)	<e>
④	λxλw.came′(x)(w)	<ep> = <e,st>
⑤	λw.came′(f(WHO))(w)	<p>
⑥	λfλw.came′(f(WHO))(w)	<cp>
⑦	$\lambda p_c \lambda w \exists f.p_c(f)(w)$	<cp,p>
⑧	λw∃f.came′(f(WHO))(w)	<p>

We have seen that a straightforward compositional semantics can give us the observed meaning of Japanese indefinites like *dareka*, where we have assigned a specific semantic contribution to each of the two morphemes from which they are composed.

4. *-ka* as existential quantification over choice functions II: questions

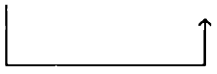
Having outlined a specific semantic proposal for how to interpret indefinites like *dareka* 'someone', we now turn to consider how this proposal translates into the domain of questions. Specifically, given that *dare-ka* (26a) and questions involving *dare* 'who' and the question marker *-ka* (26b), involve the same individual components, we will try to carry over the semantic proposals from the previous section to account for questions as well.

(26) a. **dare-ka**-ga hon-o katta.
who-Q-NOM book-ACC bought
'Someone bought books.' (Kuroda 1965:97)

b. **dare**-ga hon-o kaimasita **ka**?
who-NOM book-ACC bought **Q**
'Who bought books?'

In chapter 2 we saw evidence, primarily from Sinhala, Japanese, and Okinawan, that the appearance of the question marker *-ka* at the clause periphery in (26b) comes about through movement from a clause-internal position, as illustrated in (27).

(27) **dare** t_i ... kaimasita-**ka**?



Let us start by considering the semantics we *expect* for a question like (26b) based only on the discussion from section 1. Adopting a Hamblin/Karttunen-style semantics for questions,[21] we expect the question in (26b) to have a semantic value something like (28), which characterizes a set of propositions of the form *x bought books*.

(28) $\lambda p \exists x.p=\lambda w.\text{bought}'(x, \text{books}')(w)$

However, (28) is not *quite* what we want, since the answers to (26b) should be restricted to cases in which *x* takes on a value from the set of human individuals.

Thinking back to the indefinites like *dareka* discussed in the previous section, we might suppose that the source of this restriction is the same in both cases, since indefinites and questions appear to be built from the same materials. Specifically, recall that for indefinites, the individual in argument position was restricted to humans (for *dareka*) by means of a choice function which selected a member from the set of humans. Doing the same thing here amounts to replacing the *x* in (28) with the choice function variable $f(\text{WHO})$ in (29), where I am using "WHO" to refer to the set of human individuals ($\text{WHO} \equiv [\![\textit{dare}]\!]$). The set of propositions characterized by (29) contains the propositions of the form *x bought books* for all the values of *x* that can be chosen (in some way) from the set WHO. This is the semantic representation we end up with. This is the representation that we expect for the question.

(29) $\lambda p \exists f.p=\lambda w.\text{bought}'(f(\text{WHO}),\text{books}')(w)$

Now, let us rejoin our discussion of the syntax of the Japanese question (26b) in conjunction with our previous proposals about the semantic contributions of *dare* and *-ka*. As mentioned above, in the previous chapters we reviewed syntactic arguments that *-ka* moves from a clause-internal position up to an interrogative clause-level head. This procedure will yield the constituency given in (30) for the question (26b).[22]

(30) $C°\text{-ka}_i\ [_{IP}\ [t_i\ \text{dare-ga}]\ [\text{hon-o katta}]]$

Focusing first on the constituent below the landing site of *-ka* (roughly "IP"), notice that the semantic representation compositionally produced by the system proposed for indefinites will correctly yield a subpart of our expected semantics from (29); specifically, it accounts for the content of the proposition, the part following "p=". We will work this out in detail later, but it is clear enough from inspection that this is true: the trace of *-ka* is a choice function variable, taking *dare* 'who' as its argument and returning an individual (type <e>) which can be taken as a normal argument to the predicate (*katta hon-o* 'bought books'). The end result at the IP level is a proposition, with the choice function variable still unbound.

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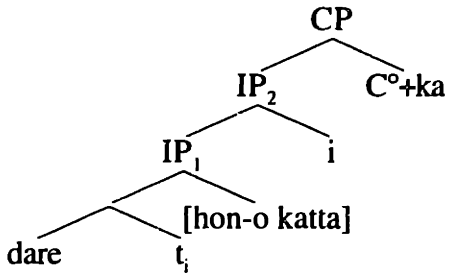
[21] Although not discussed in section 1, Karttunen (1977) contains a widely cited elaboration on and extension of Hamblin's (1973) proposal, hence the reference to "Hamblin/Karttunen-style semantics."

[22] In (30), and for the rest of this and the next two chapters, I refer to the interrogative head as C°. I do not mean to commit to a view that this is necessarily syntactically a complementizer (like English *that*). One reason we might not want to consider this as a C° head is, as we saw in our early discussions of Sinhala that *də* 'Q' seems to move to a position below *kiyəla* 'that'. Nevertheless, I continue using the notation "C°" since it seems as clear as anything I could use in its place.

The rest of the representation in (29) is due to the joint semantic contribution of the interrogative complementizer and *-ka*. Assuming that *-ka* moves up to C° to form a complex head, *-ka* and C° are a constituent. At this point, we reach a nontrivial issue, which is how to compositionally interpret head-movement of this sort. This is a particularly important question due to the convention of movement that we have adopted (recall section 2) under which the index is treated as a separate node in the semantic composition, responsible for λ-abstracting over the variable left in the trace position.[23] Clearly, the λ-abstraction (i.e., the "index node") must be in a position to bind the variable. As it happens, we can interpret the indexing convention in a consistent way in these cases, but it is a point that is worth bringing out.

Recall that for XP movement, the idea is that the index node forms a constituent with the scope of the moved element. When we consider head-movement of *-ka* to C°, forming a complex head, it is still reasonable to consider the complement of C° (that is, IP) as the scope of the moved constituent (part of the complex head whose sister is IP). The indexing convention then tells us that the index node should be a constituent with IP, which in fact properly allows the variable to be bound. This is illustrated in (31).[24]

(31)



The result of the discussion above is the conclusion that the sister of C° will be a proposition abstracted over choice functions. We can then give a semantic value for the contribution of the complex C° head, as in (32).

(32) $[\![[C°+\textit{-ka}]]\!] = \lambda p_c \lambda p \exists f.p=p_c(f)$ <cp,pt>

The idea is that the IP_2 in (31) is an unsaturated proposition, requiring a choice function; that is, IP_2 has type <cp>. What the complex C° head does is take this unsaturated proposition as an argument (the p_c in (32)), and turns it into a set of propositions (type <pt>) derived by substituting in all possible choice functions.

Head movement is assumed to create a complex head which itself has internal constituency; one part will be the C° head itself, and the other part will be the adjoined *-ka*. We already have a proposal for the semantic value of *-ka* from the previous section, and, in fact, we can roughly see its presence as the "∃f" part within (32). We can factor out the

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[23] The gravity of this issue was brought to my attention by Paul Portner (p.c.).

[24] As David Pesetsky (p.c.) pointed out to me, if *-ka* were not a head but rather something moving into a specifier or adjunct position as an XP, this issue does not even arise. The semantics works out just as easily either way, although the semantic value of the interrogative complementizer would have to be modified in sympathy. We will continue to assume that *-ka* is a syntactic head, however (cf. also the discussion of this issue near the end of chapter 2).

meaning we assigned to *-ka*, arriving at a semantic value for the interrogative complementizer alone. This is done in (33).

(33) $[\![C_{[+interrogative]}°]\!] = \lambda Q \lambda p_c \lambda p.Q(\lambda g.p=p_c(g))$ <<cp,p>,<cp,pt>>

The interrogative complementizer takes *-ka* as an argument, and returns (32). Recall that *-ka* is a function from unsaturated propositions to propositions (type <cp,p>), and that C°+*-ka* is a function from unsaturated propositions to sets of propositions (type <cp,pt>), so the type of the interrogative C° must be <<cp,p>,<cp,pt>>.

The definition in (33) is fairly complicated, but the crucial part is that which is contained within the outermost parentheses. We start with the proposition that p is the same as the proposition we get by saturating p_c with the choice function *g*. Abstracting over *g* gives us something of the right type to give as an argument to Q (which will be the semantic value of *-ka*). Applying the semantics of *-ka* to this newly formed unsaturated proposition yields:

(34) a. $[\![\textit{-ka}]\!](\lambda g.p = p_c(g))$

b. $(\lambda g.p = p_c(g))\ \lambda p_c\ \exists f.p_c(f)$

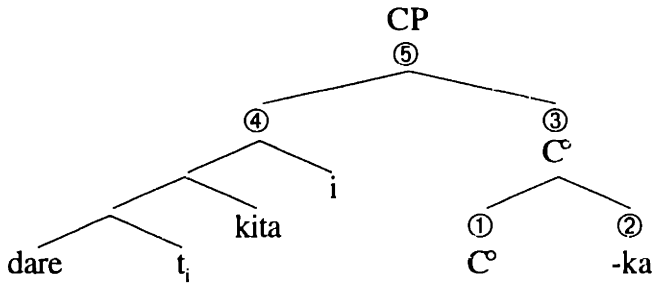
c. $\exists f.f\lambda g.p = p_c(g)$

d. $\exists f.p = p_c(f)$

This is exactly what we want inside the abstraction over propositions p to derive, e.g., (29).

As the last step in this section, let us go through a fully explicit derivation of a simple question *dare-ga kita-no?* 'who came?' which will have much the same structure as the indefinite sentence *dareka-ga kita* 'someone came' analyzed in the previous section. Where the tree below and the tree from the previous section (in (25)) are identical, I omit them from the derivation.

(35)



①	$\lambda Q \lambda p_c \lambda p[Q(\lambda g[p=p_c(g)])]$	<<cp,p>,<cp,pt>>
②	$\lambda p_c \lambda w \exists f.p_c(f)(w)$	<cp,p>
③	$\lambda p_c \lambda p \exists f[p=p_c(f)]$	<cp,pt>
④	$\lambda f \lambda w.\text{came}'(f(\text{WHO}))(w)$	<cp>
⑤	$\lambda p \exists f.p=\lambda w.\text{came}'(f(\text{WHO}))(w)$	<pt>

The technological details aside, the claim that I am making here is that the semantic representation of *-ka* even in questions is fundamentally the same as it was for indefinites,

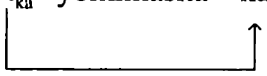
an existential quantifier, quantifying over choice functions. We have seen that it is possible to assign a single semantic contribution to *-ka* and derive the meanings both for indefinites (as we saw in the previous section) and for questions. Combining this with the results from the first few chapters, we can conclude that this same existential quantifier is carried (by syntactic movement) to the clause periphery (forming a complex head), where it is interpreted as a semantic argument of the interrogative complementizer.

5. *Wh*-words in islands and flexible functional application

One celebrated environment in which Japanese *wh*-words can find themselves is within (complex noun phrase and adjunct) islands. Much has been made of this in the syntactic literature, as well as in chapters 2–4. Recall that we reviewed examples like (36) and concluded that they must have a structure like (37), where *-ka* launches from outside the island to the clause periphery.[25]

(36) kimi-wa [**dare**-ga kai-ta hon-o] yomi-masi-ta **ka**?
you-TOP **who**-NOM wrote book-ACC read.POL **Q**
'Who did you read books that t wrote?' (Nishigauchi 1990:40)

(37) kimi-wa [dare-ga kaita hon-o] t_{ka} yomimasita ka?



The structure in (37) has nontrivial implications for the semantics of these questions, since in the previous section we assigned a semantic role to the launching site of *-ka*. Specifically, the trace of *-ka* is the choice function variable.

First, notice that in (37), the choice function variable is essentially outside an entire proposition, which we assume it takes as an argument. This raises some questions. First, a choice function chooses a member from a set. Where is the set in (37)? Second, the choice functions discussed in the previous section were choice functions from sets of individuals to individuals. What semantic type are the members of the set in (37)?

Let us "ignore" these questions for a moment, and try to work out the compositional semantics of the island. Here, I'll take what may be a simplistic view of the relative clause modification and just intersect the properties expressed by the head noun and by the relative clause. Working our way through it, we discover that we hit a snag at the point represented by the last line of (38).

[25] In chapter 4, we discussed the relation between the base position of *-ka* and that "launching site" of *-ka*, and concluded that *-ka* actually moves *to* the launching site from inside the island. Nevertheless, we will suppose here that only the launching site (and not the base position) is semantically *active*. We will return to this point at the end of this section, and in more detail in chapter 8.

(38) ⟦ [[dare-ga kaita] hon-o] ⟧ =

⟦ hon ⟧ ∩ ⟦ dare kaita ⟧ =

λx.book′(x) ∩ λx.wrote′(WHO, x) =

λx.[book′(x) & wrote′(WHO, x)]

The snag is this: ⟦ *dare* ⟧ = WHO, which as proposed in the previous section, is a set of individuals (specifically, the human individuals). However *kaita* 'wrote' is a two place predicate whose arguments are *individuals*, not *sets* of individuals. In other words, we have a type mismatch at the end of (38).

Suppose we stubbornly insist that the composition must go on. How then would we compose a property of individuals and a set of individuals? There is a natural way to do this; we perform the composition with *each* of the individuals in the set of individuals. Since there are many results of this predication (one for each of the individuals in the set of individuals), we collect the results in a set. Thus, instead of getting a property, we get a set of properties. This idea was already proposed by Hamblin (1973):

> This does not mean, of course, that the formula 'who walks' asserts that the set of human individuals walks: we must modify other stipulations in sympathy. We shall need to regard 'who walks' as itself denoting a set, namely, the set whose members are the propositions denoted by 'Mary walks', 'John walks', ... and so on for all individuals. (Hamblin 1973:48)

Concretely, if we suppose that WHO consists of {A, B, C, ... }, we can continue (38) as follows:

(39) λx[book′(x) & {wrote′(A, x), wrote′(B, x), wrote′(C, x), ...}] =

{ λx[book′(x) & wrote′(A,x)], λx[book′(x) & wrote′(B,x)], ... } =

{ P: ∃y ∈ WHO: P = λx[book′(x) & wrote′(y,x)] }

In (39), we twice made use of the idea that when a predicate receives a set of arguments instead of a single argument, we propagate the sethood by creating a set of results of applying the predicate to each of the arguments in the set of arguments. We can extend this more generally to cases where sets of predicates are to be applied to a single argument, or where sets of predicates are to be applied to a set of arguments. We will call this mode of composition "flexible functional application" (see also Rooth 1985, Bittner 1994, Heim 1994, Rullmann & Beck 1997), which can be formalized as in (40).

(40) FLEXIBLE FUNCTIONAL APPLICATION

$[\![f\ a]\!]$ = (where f and a are sisters)

(i) $f(a)$

(ii) $\lambda m \exists x.[m=f(x) \wedge a(x)]$

(iii) $\lambda m \exists g.[m=g(a) \wedge f(g)]$

(iv) $\lambda m \exists g \exists x.[m=g(x) \wedge f(g) \wedge a(x)]$

whichever is defined.

Now, following the foregoing discussion, the island in (37) is going to be represented in the logical structure as a set of properties, i.e. as (39). Going back to the questions we were "ignoring," we can now both identify the set which is being taken as the argument of the choice function introduced by *-ka* and identify the type of its elements. The set is (39), and it is a set of properties.

In the previous sections, *-ka* introduced a choice function which chose individuals from sets of individuals (type <et,e>). In (37), the argument of *-ka* is a set of *properties*, and it is clear that we want *-ka* to introduce a choice function which chooses properties from sets of properties. In other words, the choice function introduced by *-ka* needs to be a truly *general* choice function, not a choice function restricted only to choosing from sets of individuals. This is an important observation, but it does not fundamentally alter anything proposed so far; we must simply take the type of $[\![ka]\!]$ to be <αt,α> (for, presumably, any type <α>) instead of strictly casting it as type <et,e>.[26]

If we continue through the derivation of (36), making use of flexible functional application, we wind up with something like (41) below. In (41), the "∃x" comes from existential closure over the indefinite object (which I'm treating just like a bare noun phrase, e.g., *hon* 'book'),[27] and *A* is standing in for the set of properties from (39).

(41) $[\![C°+ka]\!] \exists x.\text{you-read}'((f(A))(x)) =$
where $A = \{ P: \exists y \in \text{WHO}: P = \lambda x[\text{book}'(x) \ \&\ \text{wrote}'(y,x)] \}$

$\lambda p \exists f.p = \exists x.\text{you-read}'((f(A))(x))$

The function in (41) characterizes exactly the set we want as our answer set for (36).[28]

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[26] For simplicity, I will just treat the <αt,α> $[\![ka]\!]$ as a shorthand for a "family" of (homophonous) lexical items; i.e. the *-ka* with type <et,e>, the *-ka* with type <pt,p>, and so forth. Certainly there are more insightful ways to deal with this, but it isn't really important at the moment.

[27] We may well want to consider normal indefinites like *hon* 'book' as also involving choice functions; i.e. something like ∃g...g(book) instead of ∃x...book(x). I do not represent this above, however, in the interest of readability.

[28] At this point, there is an issue that becomes particularly evident, although it has been hiding in the background in previous sections as well. Notice that the *semantic value* of the question depends on the membership of the set WHO. For any two given interlocutors, the chances are vanishingly small that they share exactly the same set of acquaintances; does this play a role in the semantic value each person assigns to WHO? Does this mean that the question *Who left?* has a different semantic value when uttered by me and when uttered by my officemate? Whether this is even a problem is not entirely clear; is the semantic value of the utterance *The grass is green* dependent on the utterer's color divisions and botanical background? This raises difficult issues which are outside the scope of this discussion. It is likely that we will want to divorce the semantic representation from facts about the world, but the determination of how best to implement this must be left for another forum.

(42) {you read a book A wrote, you read a book B wrote, you read a book C wrote, ...}
where WHO = {A, B, C, ...}

The goal of this section has been to point out one of the implications of the juxtaposition of the syntactic story about how *-ka* moves in the context of islands and the semantic story about the logical representation assigned to the launching and landing sites of *-ka*. We have seen that in cases where *-ka* is launched from a place where it takes a constituent larger than a *wh*-word as its argument, the semantics still work out if we assume a mode of composition that allows sets to propagate through the semantics.

Another side comment is worth making here about the set we arrived at in (42); the propositions in this answer set vary by author, as they should. That is, one answers a question like (36) by making reference to the author and not simply making reference to books. This was pointed out in chapter 4 as being a problem with the semantics proposed by Nishigauchi (1990), which predicts that such questions could be answered by simply referring to books (reviewing a point previously made by Ohno 1989, von Stechow 1996a, as well as by Barbara Partee, p.c. to Nishigauchi, as noted by Nishigauchi himself in a footnote).

The relation between the discussion at the beginning of chapter 4 (distinguishing the base position and the launching site of Q) and the postulation of flexible functional application here deserves comment (as promised in footnote 25). First, it is true that if the *base position* of Q (and not the *launching site*) introduced a choice function variable, we would not have needed flexible functional application to derive the semantic value of (36); it would work in the same way as non-island cases. However, this does *not* mean that we can do without flexible functional application altogether. In fact, flexible functional application will be crucial in deriving pair-list readings in chapters 6 and 7, even outside the context of islands.

Even in single-*wh*-questions, we make crucial of flexible functional application in deriving the semantic representation in cases of "*-ka* drop" in Japanese. These are questions, such as that given in (43) below (repeated from chapter 1), which lack *-ka* but nevertheless have a question meaning.

(43) dare-ga kuru? (*rising intonation*)
who-NOM come
'Who will come?'

If *-ka* is absent, it surely cannot be the source for a choice function variable. However, flexible functional application predicts both the availability of question meanings for questions like (43) as well as the actual meanings that such questions can get (this is discussed in more detail in chapter 6). How this works for (43) is clear by inspection; *kuru* translates as come′, which takes a type <e> argument. *dare* translates as WHO, which is a set of type <e> arguments. Composing the two triggers flexible functional application, which results in the application of come′ to each of the members of WHO, and the collection of the resulting propositions in a set. This is a set of propositions, the canonical type of a question; hence, (43) has a question meaning.

The point of this discussion is to highlight the fact that we need flexible functional application even outside the cases where a *wh*-word is found inside an island (e.g., to account for cases like (43)). Thus, although there is evidence for a trace of *-ka* inside the island (cf. chapter 4), this only undermines the motivation for using flexible functional application in this *one* case. Moreover, we will see in chapter 8 that we can only predict the correct meanings for multiple-*wh*-questions if we assume that the only semantically active trace of *-ka* is at the *launching site* of *-ka*. That is, the choice function variable introduced at the "trace of *-ka*" in the preceding discussions in this chapter is introduced specifically at the *launching site* of *-ka*, not at, for example, its base position (if different from the launching site).

6. Chapter wrap-up

In this chapter we started to address the issues involved in mapping the syntax of questions that was developed over the first four chapters onto the semantics of questions. So far, we have considered only questions with a single *wh*-word, and spent our energy developing an analysis of the semantics of questions which can also handle the fact that the same components found in questions (for example, in Sinhala and Japanese) can be found in indefinites as well.

The approach we are pursuing here is, for the most part, a fairly standard one in the recent literature on the semantics of questions. We start from the premise that the semantic value of a question is a set of propositions which constitute (in some technical sense) "answers" to the question. By supposing that the semantic value of a *wh*-word is a set of individuals and that the basic semantic value of the Q morpheme (*-ka* in Japanese, *də* in Sinhala) is that of an existential quantification over choice functions, we are able to derive the appropriate semantic representations for both indefinites and for single *wh*-questions. The specific proposal is repeated below.

(24) a. $[\![\textit{dare}]\!] = \lambda x.\text{human}'(x)$ <et>

b. $[\![\textit{-ka}]\!] = \lambda p_c \lambda w \exists f.p_c(f)(w)$ <cp,p>

By using the definition above in conjunction with our hypothesis about the semantics of questions, we were also able to posit the following semantics for the interrogative complementizer.

(33) $[\![C_{[+\text{interrogative}]}{}^{\circ}]\!] = \lambda Q \lambda p_c \lambda p.Q(\lambda g.p=p_c(g))$ <<cp,p>,<cp,pt>>

We assume that in the mapping from the syntactic structure to the semantic representation, the trace of Q (i.e. *-ka*), introduces a choice function variable (referred to as *f* in (24b)).[29]

[29] We must assume that the semantic evaluation procedure can differentiate the trace from the moved element in its landing site, even if the trace of movement is in general an identical copy of the element which moves. This implies that semantic interpretation cannot proceed strictly bottom-up (at least not without some ability to revise decisions about composition once one encounters the head of a movement chain), but rather must be able to detect a whole chain so it can differentiate the head from the tail.

We saw ample evidence in the first few chapters (particularly chapter 2) that Q can be launched from outside of islands, which puts an interesting twist in the semantics as well, assuming that the island-external launching site is responsible for introducing the choice function. In particular, it means that we needed a way to evaluate the semantic values *inside* the island without the help of Q. We proposed that this is accomplished by means of "flexible functional application," the definition of which is repeated below.

(40) FLEXIBLE FUNCTIONAL APPLICATION

$[\![f\ a]\!] =$ (where f and a are sisters)

(i) $f(a)$

(ii) $\lambda m \exists x.[m=f(x) \wedge a(x)]$

(iii) $\lambda m \exists g.[m=g(a) \wedge f(g)]$

(iv) $\lambda m \exists g \exists x.[m=g(x) \wedge f(g) \wedge a(x)]$

whichever is defined.

For the moment, flexible functional application is simply required by the syntactic analysis we adopted in the first few chapters. However, we will see in the next chapter that we have independent reason to believe that flexible functional application is needed for questions above and beyond the semantics of Q given above.

All in all, the main accomplishment of this chapter was to show that we can define a coherent semantics for Q and for *wh*-words which can both account for their use in *wh*-questions and account for their use in indefinites, while remaining faithful to the syntactic structures proposed in chapters 1–4.

Chapter 6 A semantics for multiple and functional questions

1. A semantics for multiple questions

So far, we have only considered cases which involve single *wh*-words, but we now turn to consider the more complex issues which arise for questions with more than one *wh*-word. To simplify the discussion, we will concentrate only on multiple *wh*-questions that involve two (as opposed to three or more) *wh*-words.

Multiple questions have two distinguishable kinds of readings (as we recall from chapter 3). A question like (1a) may be answered with a list, such as the one in (1b). This reading is commonly referred to as the *pair-list* reading, since the information it provides is a list of pairings between buyers and buyees.

(1) a. Who bought what?
b. John bought beer, Mary bought soda, and Bill bought motor oil.

Another way to think about the pair-list reading is as a series of questions, the answers to which are provided in the response. In this light, asking (1a) is something like asking *What did John buy? What did Mary buy? What did Bill buy?* Thus, the pair-list reading of a multiple question stands in for a whole set of questions. The analysis to be proposed shortly will be a formalization of this intuition.

Some *wh*-questions resist being answered by lists of pairs, but rather seem to be answered by providing a single proposition, filling in a single value for each *wh*-phrase. This reading will be referred to as the *single-pair* reading. The question in (2a) has a single pair reading, answered by a single proposition like (2b).[1]

(2) a. Who asked whether Sue bought what?
b. John asked whether Sue bought ice.

The semantics of questions we developed in chapter 5 represents a single-*wh*-question as the set of propositions that serve as answers to the question; e.g., *What did John buy?* is represented by the set of propositions {*John bought beer*, *John bought soda*, ...}. Consistent with that view, let me suggest that the pair-list reading of a multiple-*wh*-question is actually standing in for a set of questions, formally a *set of sets* of propositions. Concretely, the representation of the multiple question in (3a) would be something like (3b), or more explicitly, (3c).

[1] Example (2a) was chosen because it seems to be biased toward a single answer reading, but with the right context and prosody this preference for a single-answer reading seems to be able to be overridden.

(3) a. Who bought what?
b. {*What did John buy?*, *What did Mary buy?*, *What did Bill buy?*}
c. {{John bought beer, John bought soda, John bought motor oil},
{Mary bought beer, Mary bought soda, Mary bought motor oil},
{Bill bought beer, Bill bought soda, Bill bought motor oil} }

One advantage of the representation in (3) is that it does not require us to add anything new to our semantic ontology; just as we defined questions as being sets of propositions, we now define the pair-list meaning as being a set of questions.

This is perhaps a good time to call attention to some assumptions we need to make about the pragmatics of questions. Although for the most part tacit throughout the discussion in the previous chapter, an important ingredient of our analysis of questions is the assumption that the listener, upon hearing an utterance whose semantic value is a set of propositions, interprets this as a question and understands his/her task to be to choose an answer from among these alternative propositions. Let us call this rule Single Question Recognition.

(4) *Single Question Recognition*
If the semantic value of an utterance is of type <pt> (a set of propositions),
then the utterance is a (single) question.
To respond: (a) one proposition from the set is selected,
or (b) the presupposition (that there is an answer) is denied.

In the discussion above, we introduced a new semantic type for the pair-list question. It is a set of questions, a set of sets of propositions. Since Single Question Recognition does not apply to utterances of this semantic type, we need to state what happens when an utterance has the type of a set of questions. We will call this rule Multiple Question Recognition.

(5) *Multiple Question Recognition*
If the semantic value of an utterance is of type <pt,t> (a set of questions),
then the utterance is a (pair-list multiple) question.
To respond: For each member set *A*,
(a) one proposition from the set *A* is selected,
or (b) the presupposition (that there is an answer in *A*) is denied.

Multiple Question Recognition essentially treats a set of questions by treating each member question as its own single question.

Before we are through, we will need to add one more recognition assumption to the list ("Lifted Question Recognition"), but we will postpone discussion of this until chapter 7.

We will not make any attempt to derive (4) and (5) from anything more basic; they are treated here as (perhaps arbitrary) facts about the pragmatic aspect of language and its sensitivity to semantic type.

Questions with a single-pair reading, like (2a), do not appear to be sets of questions, but rather a single question. For such questions, the answer is a single proposition (not a list of propositions), implying that the answer set has the same form as a single-*wh*-question does, a set of propositions.

To foreshadow a later point, let me call attention again to the fact that the *types* of a pair-list reading and of a single-pair reading differ; the single-pair reading of a multiple-*wh*-question, like a single-*wh*-question, is a set of propositions, type <pt>. The pair-list reading of a multiple-*wh*-question is different; it is a set of questions, type <pt,t>. This difference will become relevant in section 4 when we discuss scope phenomena in questions with more than one interrogative clause.

We have now motivated our expectations for the semantic representation of multiple questions, but it remains to be seen how these representations are derived in the system being proposed. We will start with an interesting case from Japanese that suggests an analysis along the lines outlined above, and also demonstrates the importance of the flexible functional application mechanism in deriving the meanings of questions.

As we saw at the end of chapter 5, the question marker *-ka* can be dropped while still maintaining the meaning of a question in informal Japanese speech, as observed by Yoshida & Yoshida (1997). However, there is an effect on the interpretation, as pointed out by Miyagawa (1997a). In multiple questions like (6a), a pair-list interpretation is allowed only when the question marker *-ka* is present. If *-ka* is dropped, as in (6b), only the single pair interpretation remains.

(6) a. dare-ga nani-o motte kita no?
who-NOM what-ACC brought Q
'Who brought what?' (pair list reading available)

b. dare-ga nani-o motte kita?
who-NOM what-ACC brought
'Who brought what?' (single pair reading only) (Miyagawa 1997a)

This is a curious state of affairs, since in chapter 5 we attributed a nontrivial semantic content to the question marker (and its "launching site") in deriving the semantics of questions. How can something like (6b) still have the meaning of a question?

The answer lies in the availability of flexible functional application (as we already saw at the end of chapter 5). Flexible functional application was initially introduced in chapter 5 to handle the semantics of *wh*-words inside islands; it repairs a certain kind of semantic type mismatch, including cases where a function receives a *set* of arguments rather than a single argument. What happens in such a case is that the function is applied to each argument in the set of arguments, and the results are collected into a set. This was the way we analyzed islands, and this is the way will analyze (6b) as well; in effect, (6b) will be treated as a big island. Here we will look at how the question meaning of a *-ka*-less question like (6b) is derived in somewhat more detail (and with a slightly more complicated question) than was done at the end of chapter 5.

In (7) is a semi-formal derivation of the semantic value of (6b), which we will walk through in prose immediately below.

(7) (⟦ motte kita ⟧ (⟦ nani ⟧)) (⟦ dare ⟧) =

(brought′ (WHAT)) (WHO) =

(λP∃x∈ WHAT.P=brought′(x)) (WHO) =

λp∃x∈ WHAT, ∃y∈ WHO.p = (brought′(x))(y) =

{A brought α, A brought β, ... B brought α, B brought β, ... }
(where WHO = {A, B, ...} and WHAT = {α, β, ...})

A *wh*-word (which represents a set of individuals) in the object position of a transitive verb yields a set of properties (with the help of flexible functional application, which applies the second-order property to each individual in the set in object position, yielding a set of first-order properties). If that set of properties is then to be applied to a *wh*-word in subject position, each property in the set of properties is applied to each member of the set represented by the subject *wh*-word. The result is a set of propositions, one for each possible subject with each possible object.

The end result of (7) is a set of propositions of the form *x brought y* for *x* people and *y* things. A set of propositions is a question, answered by selecting one of its members. Happily, (7) is exactly the answer set we would expect for the single-pair reading of the multiple question (6b); choosing one proposition entails choosing a single pair of bringer and bringee. Notice, however, that there is no question morpheme *-ka* in the utterance; it is not in fact needed in this case, since a set of propositions can be formed simply by virtue of the fact that the *wh*-words represent *sets* of individuals and flexible functional application propagates these sets through the composition. Furthermore, there is no reason to think that there is an interrogative complementizer in (6b), since it is not needed to get the correct semantic representation. In fact, if the interrogative complementizer (syntactically) "drives" the movement of *-ka* to the clause periphery in normal questions; whatever requirement motivates that movement could not be satisfied in (6b) since *-ka* is not present to be moved.[2]

Here is where we are: we have reviewed the representations we expect for two distinguishable meanings a multiple-*wh*-question can take on, and we have seen in one specific case, how the single pair meaning might arise. We now take on the second question, which is how the more complicated pair-list meaning can arise. A good place to start considering this question is with (6a), repeated below. What differentiates (6a) from the single-pair question (6b) we were discussing above is that (6a) has a question marker and as a result has a pair-list reading.

(6) a. dare-ga nani-o motte kita no?
who-NOM what-ACC brought Q
'Who brought what?' (pair list reading available)

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[2] My preliminary investigations seem to indicate that such "Q-less" questions are also possible in Sinhala, as in (i). Notice that along with the lack of *da*, the 'E' morphology is also missing.

(i) kauru mokak gatta?
who what bought
'Who bought what?' (Dileep Chandralal, p.c.)

The task is this: We need to derive from (6a) a representation which is a set of questions, i.e. a set of *sets of* propositions. Our proposal from the previous chapter was that in a *single* question, the choice function introduced by *-ka* chooses a single member from the set introduced by a *wh*-word, resulting in something which is not a set. A simple example is given below in (8a), the semantic value of which is given in (8b).

(8) a. John-ga nani-o katta no?
John-NOM what-ACC bought Q
'What did John buy?'

b. $\lambda p \exists f.p=\lambda w.\text{bought}'(f(\text{WHAT}))(\text{John})(w)$ <pt>

The result in (8b) is a set of propositions, which vary in the identity of the choice function *f*.

Suppose we minimally alter (8a) by replacing *John* with *dare* 'who', holding everything else constant. The result is in (9).

(9) **dare**-ga nani-o katta no?
who-NOM what-ACC bought Q
'Who bought what?'

Now if (8b) characterizes a set of propositions (of the form *John bought x* for *x* things chosen from the set WHAT), we expect that through the action of flexible functional application, (9) will yield a set of sets of propositions, one set of propositions for each value *y* in the set WHO. This follows from exactly the same logic that got us a question meaning for the *-ka*-less question in (6b). The set we are after is the following:

(10) {{A bought f_1(WHAT), A bought f_2(WHAT), ...},
{B bought f_1(WHAT), B bought f_2(WHAT), ...}, ... }

That is, informally, the set {*What did A buy?*, *What did B buy?*, ...}. Notice that this set has one question for *each* member of WHO. That is, a question like (9) asks a question about each of the contextually relevant people.

To properly answer (9) is to provide an answer to each of its component questions. This is the function of the pragmatic assumption made above, the Multiple Question Recognition assumption. It is repeated below in (5).[3]

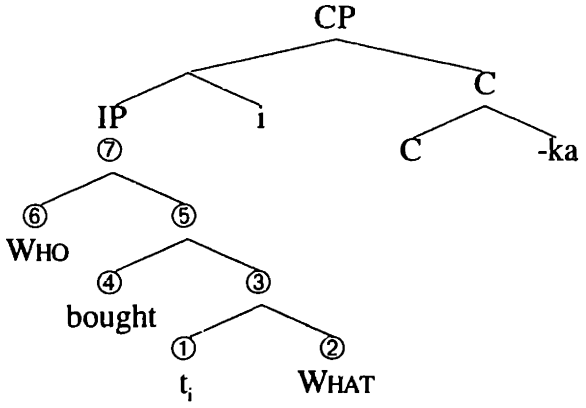
(5) *Multiple Question Recognition*
If the semantic value of an utterance is of type <pt,t> (a set of questions), then the utterance is a (pair-list multiple) question.
To respond: For each member set *A*,
(a) one proposition from the set *A* is selected,
or (b) the presupposition (that there is an answer in *A*) is denied.

[3] Allowing for denying the presupposition allows an answer like *John bought beer, Mary bought soda, and Bill didn't buy anything* to the question *Who bought what?*

As a result of (5), *who* gets a kind of "universal force" insofar as it asks a question for every individual member of WHO (which by (5) must then be answered). This effect has been observed by É. Kiss (1993), who proposed that the superior *wh*-word is in fact "converted into a universal quantifier" in some unspecified way. While we do not adopt her mechanism which interprets a *wh*-word as a universal quantifier, we nevertheless account for the observed universal force that the superior *wh*-word carries in the pair-list reading.[4] Of course, this prediction assumes that the proposed structure is correct, and we have yet to discuss how we predict that structure in these cases.

We have now discussed the issues in enough detail that we can tackle a fully explicit derivation of the semantic value of a pair-list question like (9). For the most part, the technical details are already in place and so they require minimal comment. An issue arises in one of the later stages of the derivation, which we will address after laying out the straightforward part of the derivation.

(11)



①	λP.i(P)	<c>
②	λx.thing′(x) = WHAT	<et>
③	i(WHAT)	<e>
④	λxλyλw.bought′(x,y)(w)	<e,ep>
⑤	λxλw.bought′(x, i(WHAT))(w)	<ep>
⑥	λx.person′(x) = WHO	<et>
⑦	λp∃x∈ WHO.p=λw.bought′(x, i(WHAT))(w)	<pt>

At the point (node ⑦) where the derivation in (11) ends, we have evaluated up to the IP level and have come up with a set of propositions, of the form *x bought f(WHAT)* for all of the *x*'s in WHO. Note that if the subject were not a *wh*-word but a single individual (e.g., *John*), then the semantic value at this point would be just a single proposition (e.g., *John bought f(WHAT).*).

The first issue we need to address is what happens at the next step of the derivation, which is the λ-abstraction of *i* over a set of propositions. To start off the discussion, consider the normal rule for λ-abstraction, given in (12). By making use of assignment functions, it turns a metalinguistic λ into a true λ, binding a variable inside φ.

[4] The universal force itself stems from the "each" in the response instruction for (5).

(12) $[\![\lambda i.\varphi]\!]^g = \lambda x.[\![\varphi]\!]^{g[i \to x]}$

This is fairly straightforward when φ is a proposition. What happens if the type of φ is a set (i.e. <μt> for some type <μ>)? In the spirit of flexible functional application, since we know what we want to happen in the normal case (λ-abstraction over a proposition like *John bought f(WHAT)*, for example), if we have a set of "normal cases," then we want to apply the operation to each member of the set. We can formalize this in the following way.[5]

(13) FLEXIBLE LAMBDA-ABSTRACTION

$[\![\lambda i.\varphi]\!]^g = \lambda A \exists \phi.A=[\ \lambda x.[\![\phi]\!]^{g[i \to x]}\ ] \wedge \forall x.[\![\phi]\!]^{g[i \to x]} \in [\![\varphi]\!]^{g[i \to x]}$

where a) φ is a set (type <μt>), b) the result is composable.

Given this definition, we can continue the derivation in (11) as follows. λ-abstraction over the set of propositions at the level of IP yields a *set of* unsaturated propositions, each of which requires a choice function; in other words, it yields a set of type <cp,t>. This set can be composed with the complex C° head with the help of flexible functional application. The final result is a set of sets of propositions (a set of questions), as desired.[6]

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[5] I should point out that (13) quantifies over expressions. An alternative way to approach this is to make everything a function of assignments as discussed by Rooth (1985), Kratzer (1991), Wold (1996), among others. The decision to formulate this as in (13) was made to reduce complications to the existing system.

[6] One technical issue which needs to be considered is defining the *domain of application* of "flexible lambda abstraction" as defined above. (13) is stated at its most general; flexible λ-abstraction applies any time it is confronted with a set. There is a question of what happens when we λ-abstract over a *proposition*, under the assumption that a proposition is itself a set (for example, we have been presuming that a proposition is the set of possible worlds in which the proposition is true, although the adequacy of this was questioned in a footnote in chapter 5). We want to make sure either (a) that flexible λ-abstraction over a proposition yields the right result if applied to each component world, or (b) that flexible λ-abstraction cannot apply to a proposition for some other reason.

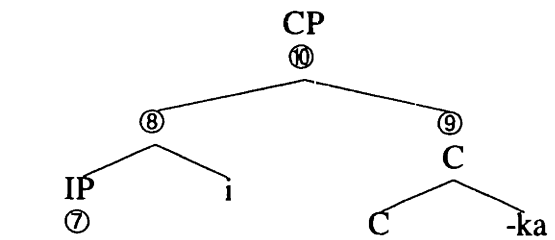
It quickly becomes apparent that (a) will not work; we cannot derive the right meaning for λ-abstraction over a proposition by breaking it into λ-abstraction over its component worlds. Thus, if we want to maintain the most general statement of flexible λ-abstraction (that is, avoiding making it something which applies specifically to sets of propositions), we must find a way to rule out λ-abstraction over component worlds of a proposition.

Here is one approach: It turns out that if we λ-abstract *into* a proposition in this way, the result will be a type mismatch that cannot be repaired by the limited means available to us. Recall that the type of mismatch that flexible functional application can repair involves sets whose *members* can compose. Consider a single-*wh*-question, where at the IP level we would be λ-abstracting over a choice function variable. If we were to λ-abstract a choice function variable, type <c>, into a proposition, type <st>, under flexible λ-abstraction this would yield a set of the results of λ-abstracting over the members, resulting in a set of functions from choice functions to possible worlds (type <cs,t>). At this point, it would need to compose with the complex C° head, which as we have seen has type <cp,pt>. Even flexible functional application cannot repair this type mismatch; shifting up or down from sets to members cannot compose something of type <cs,t> with something of type <cp,pt>.

Notice that this result does not rule out the case we *want* to derive, namely λ-abstracting a choice function <c> into a set of propositions <pt>; as we have seen, this gives us a set of functions from choice functions to propositions, type <cp,t>, which *can* compose with interrogative C° (type <cp,pt>) with the help of flexible functional application. By shifting from the *set* of type <cp> functions to the member <cp> functions, composition can proceed.

(...continues) ➡

(14)



⑦ $\lambda p \exists x \in \text{WHO}.p=\lambda w.\text{bought}'(x, f(\text{WHAT}))(w)$ <pt>

⑧ $\lambda A \exists \phi.A=[\ \lambda f.[\![\ \phi\ ]\!]^{g[i\rightarrow f]}\ ] \wedge$
$\forall f.[\![\ \phi\ ]\!]^{g[i\rightarrow f]} \in \lambda p \exists x \in \text{WHO}.p=\text{bought}'(x, f(\text{WHAT}))$
$\lambda \rho \exists x \in \text{WHO}.\rho=[\ \lambda f \lambda w.\text{bought}'(x, f(\text{WHAT}))(w)\ ]$ <cp,t>

⑨ $\lambda p_c \lambda p \exists f[p=p_c(f)]$ <cp,pt>

⑩ $\lambda Q \exists x \in \text{WHO}.Q=\lambda p \exists f.p=[\lambda w.\text{bought}'(x, f(\text{WHAT}))(w)]$ <pt,t>

Let us review what we've seen in this section. We have seen that with the mechanism of flexible functional application, introduced previously to compute the semantic value of a *wh*-word inside an island, we can also derive semantic values for the two meanings of a multiple-*wh*-question. The semantic value of a "single-pair" question has the same type as that of a single-*wh*-question, namely <pt>, a set of propositions. The semantic value of a "pair-list" question has a higher type; it is a set of questions, <pt,t>, or a set of sets of propositions. We have seen that pair-list meanings can be derived by leaving one of the *wh*-words outside the choice function variable, triggering flexible functional application and resulting in a set of questions.[7] This required a generalization of λ-abstraction, but one which is strictly within the spirit of flexible functional application.[8]

One last question is worth briefly addressing before moving on. The question in (6a), repeated below, is ambiguous. Above we saw how to derive the pair-list reading, but

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(continued...)

If we accept this approach to ruling out flexible λ-abstraction into a proposition, the foregoing discussion indicates that the compositional properties (i.e. type) of the *sister* of the result of λ-abstraction has control over whether flexible λ-abstraction is applied or not.

[7] There is an important point which I am glossing over here. Saying nothing further, this predicts that *triple wh*-questions can get one of two "pair-list" list readings, neither of which is a true "list of triples." Each will be a list of *pairs*, each pair specifying the value of one *wh*-word and the values (simultaneously) of *both* the other *wh*-words. If Q launches from above the lower two *wh*-words, a pair must be given for each member of the set introduced by the higher *wh*-word, according the Multiple Question Recognition. This *may* be the reading such questions have, but the judgments on such questions is *very* slippery, far too subtle to be seriously dealt with in this thesis. Now, notice that if Q launches from below the higher two *wh*-words (in the spirit of the story we told about single-pair readings of *-ka*-less questions in Japanese), Multiple Question Recognition as stated would require an answer for each possible pair of values the upper two *wh*-words could take on. This is combinatorially ridiculous, and clearly not a reading such questions have. However, it seems to arise from the *configuration* we would expect in a triple question, if Q-introduction Antisuperiority governs the introduction of Q into these questions. This will be mentioned again in chapter 8, when we talk about Q-introduction Antisuperiority, but it appears that certain aspects of triple-*wh*-questions remain slightly outside the coverage of the proposals in this thesis.

[8] Incidentally, the reason that flexible λ-abstraction can't actually be subsumed under flexible functional application is that λ-abstraction is insensitive to the type of its argument; this means that there would never be a type mismatch, and thus flexible functional application would not be triggered.

it also (although perhaps marginally) has a single-pair reading. How do we account for this?

(6) a. dare-ga nani-o motte kita no?
who-NOM what-ACC brought Q
'Who brought what?' (pair list reading available)

Recall from (11) that the source of the set of questions that resulted in the pair-list reading for (6a) was the *wh*-word left outside the domain of the choice function. The set contributed by the *wh*-word propagated through the semantics to yield a set of sets of propositions at the end. However, if all *wh*-words were contained within the argument of the choice function variable, this set would be reduced to one of its members before it gets a chance to propagate. That is, if we introduce the choice function variable higher in the structure, we can effectively duplicate the results we saw for (6b), the parallel question without the question marker *-ka/-no*.

Let us work this out in more detail. We will start with the premise that (6a) has a syntactic constituency like (15), where *-ka* is launched from a position *outside* the base position of both the subject and the object.[9] Although the verb might move higher syntactically, we also assume that for the purposes of compositional interpretation, it is in its base position.

(15) [dare nani motte kita] t_{ka} ka

Applying the system developed in the previous sections leads to a derivation like this:

(16) $[\![C°+ka]\!]^f (([\![\text{motte kita}]\!] ([\![\text{nani}]\!])) ([\![\text{dare}]\!])) =$

$[\![C°+ka]\!]^f (\{P: \exists y \in \text{WHAT}: P=\lambda x[\text{brought}'(x,y)]\}(\text{WHO})) =$

$[\![C°+ka]\!]^f (\{p: \exists x \in \text{WHO}: \exists y \in \text{WHAT}: p=\text{brought}'(x,y)\}) =$

$\lambda p' \exists f.\ p' = f (\{p: \exists x \in \text{WHO}: \exists y \in \text{WHAT}: p=\text{brought}'(x,y)\})$

The last step in (16) actually reduces to (17), which is a straightforward result of the theorem in (18).

(17) $\lambda p \exists x \in \text{WHO} \exists y \in \text{WHAT}.\ p = \text{bought}'(x,y)]$

(18) THEOREM: $\lambda a \exists f.a=f(A)$ characterizes A.
(for A a set and f a choice function)

We will refer back to this theorem occasionally in later derivations. The theorem guarantees that if you have a set A, the set of things one can choose from A in *some*

[9] We will return to discuss reasons for adopting such a structure in chapter 8.

manner is going to be that same set A. The truth of this is intuitively obvious, and is easily proven.[10]

What the theorem in (18) tells us about the derivation of (6a) is that in this simple case of a single-pair reading for a multiple-*wh*-question, the interrogative complementizer is not really adding anything, since the answer set already existed compositionally below the CP level. Of course, we knew that, since we saw already that (6b), which has no question marker *-ka*, nevertheless has a (single-pair) question meaning. The answer set we end up with is (19); choosing one proposition and asserting it fixes a value for both the bringer and the bringee.

(19) {A bought α, A bought β, ... B bought α, B bought β, ... }
(where WHO = {A, B, ...} and WHAT = {α, β, ...})

2. Background on functional readings

In this section, we will discuss the existence and properties of "functional answers" to *wh*-questions, in preparation for integrating these facts into our developing analysis of *wh*-questions. For previous discussions of this topic, see Engdahl (1980, 1986), Chierchia (1991, 1993), Dayal (1996), among others.

As an introduction to the issue, consider the question in (20) and its three possible answers. The question can be answered as in (20a), where every man bought the same thing and we are reporting on the identity of that thing (the "single answer"). The question can also be answered with a list, pairing men with things they bought, as in (20b) (the "pair-list" answer). There is a third kind of answer, a "functional answer" like (20c) which provides a *function* which determines, for every man, what that man bought, but without providing an explicit list.

(20) What did every man (in this group) buy?
a. Coffee.
b. John bought a cake, Fred bought a pail, and Joe bought some rice.
c. His mother's Earth Day present.

There is a contrast between the question in (20) and the question in (21) in terms of the answers which are possible. In (21), the single answer reading is available, while the other two are impossible (or at least *much* harder to get).

(21) Which man (in this group) bought every soft drink?
a. John.
b. ?* John bought the Coke, Fred bought the Pepsi, and Joe bought the RC.
c. ?* Its most vocal advocate.

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[10] PROOF: Let A be a set. D_f is a set of functions f with the property that $\forall f \in D_f$, $f(A) \in A$ and that for any $a \in A$, we can find $f \in D_f$ such that $f(A)=a$ (that is, D_f is the set of possible choice functions). Let B be the set characterized by $\lambda a \exists f.a=f(A)$. The goal is to show that B=A. Let $a \in A$. By the definition of B, $a \in B$ if for some $f \in D_f$, $a=f(A)$. By definition of D_f we can find such a function. So $a \in B$. This proves $A \subseteq B$. Let $b \in B$. By the characteristic function of B, we know that we can find a function $f \in D_f$ such that $b=f(A)$. By the definition of D_f, we know that $f(A) \in A$, so $b \in A$. This proves $B \subseteq A$, which proves A=B.

The difference between the single answer and the list answer feels (intuitively) like a difference in relative scope between the *wh*-phrase and the *every* phrase; the single answer to (20) seems to respond to the question *what is the x such that every man bought x?* while the list answer responds to the set of questions *for every man x, what did x buy?* May (1985) proposed an account which essentially formalizes this intuition, tying the availability of a list answer to the possibility of giving wide scope to *every*. This is the same approach we took in chapter 3, which we will formalize in chapter 7.

This leaves open the question of where the functional answer fits in. One possibility is that the functional answer is simply a "shortcut" to a list; that is, it provides a means of constructing a list without giving the list explicitly. If so, that would leave the distribution of functional answers essentially in the domain of pragmatics, the list answer being basic. There is some reason to be skeptical of this approach, though.

Chierchia (1991, 1993) points out that if functional answers are shortcuts to list answers, functional answers should only be available when list answers are. This prediction is not borne out by the data, however. In the question (22), both a single answer and a functional answer are possible, but not a list answer. If a functional answer were simply a shortcut to a list answer, we would expect the functional reading to be impossible as well.

(22) What does no man (in this group) like?
  a. Coffee with salt.
  b. * John likes cake, Fred likes pails, and Joe likes rice.
     * John doesn't like cake, Fred doesn't like pails, and Joe doesn't like rice.
  c. His Visa bill.

We can also see informally that paraphrasing the "list" meaning of (22) by giving the quantifier wide scope over the question leads to the nonsensical *for no man x, what does x like?*.

Examples like (22) exemplify the independence of functional readings from list readings, which tells us that we don't want to *derive* the functional reading *from* the list reading. Since (22) *lacks* a list reading, the functional reading cannot be "standing in" for the list reading.

Given this conclusion, Chierchia (1991) takes an opposite approach, claiming that list answers are a special case of functional answers, subject to more strict conditions; so, (22), for example, does not meet the stricter conditions imposed on list answers. Taking this view has the opposite implication: Wherever a list answer is possible, so should a functional answer be possible. However, this too seems like it may be too strong.

Let us put aside the question of how list answers are derived for the moment (we will return to them in the next chapter), and concentrate on what is required in the semantics for functional readings.

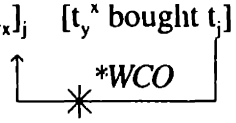
Chierchia's proposal is based on the existence of functional answers like (20c) and (22c). When (20) is a question seeking a functional answer, it would take a form roughly paraphrasable as 'What is the function F such that for every man in this group x, x bought $F(x)$?'. In particular, notice that *every* here binds the argument of the function F. Chierchia treats this argument as a bound pronoun, parallel to the bound pronoun *his* in *Every man in this group bought his mother's Earth Day present.* The representation he assigns for

(20) is (23a), where the bound pronoun is represented as a superscript on the *wh*-trace. Chierchia's proposal is that the *wh*-trace t_y^x is *interpreted* as a function taking the bound variable x as its argument.

(23) a. What$_y$ [every man$_x$ buy t_y^x]
b. What is the function y such that
for every man x, x bought (the individual returned by) $y(x)$?

Given that the function is taking a bound pronoun as its argument, this predicts that QR of the binding quantifier over the bound pronoun should result in a weak crossover violation, just as in *?*His$_i$ mother loves every boy$_i$*, where variable binding is only possible if *every boy* moves covertly to a position above *his mother* (violating WCO). According to Chierchia, this is why the missing readings in (21) are missing; they would have the structure in (24), which violates WCO.

(24) Which man$_y$ [every soft drink$_x$]$_j$ [t_y^x bought t_j]



The difficulty in getting the missing readings in (21) (which might be very marginally possible) is therefore parallel to the marginal grammaticality of (25) below.

(25) ?* Who$_i$ does his$_i$ mother like t_i?

This concludes the brief introduction to functional readings; in the next section, we will see some facts from Japanese that can help us to pin down the structure and semantic form of functional questions.

3. Functional readings in Japanese and the base position of Q

According to Miyagawa (1997a), functional readings in Japanese are possible when the universal quantifier *daremo* 'everyone' precedes a *wh*-word, as in (26).[11,12]

(26) **daremo**-ga **dare**-o aisiteiru no?
everyone-NOM **who**-ACC love Q
'Who does everyone love?'
i. (zibun-no) hahaoya-desu.
self-GEN mother-be
'(It is) his mother.'

[11] According to Shigeru Miyagawa (p.c.), the contrast is even clearer with *hotondo daremo* 'almost everyone'.

[12] As mentioned in an earlier footnote (in chapter 2), preliminary investigation of the corresponding examples in Sinhala seem to show similar results. Thus, (i) is not well-formed on a pair-list reading, but improves if taken to be asking for an answer like '*his name*' (Dileep Chandralal, p.c.).

(i) kaurut mokak də kiiwe?
who-T what Q said-E
'What did everyone say?'

ii. (?*) Taroo-desu.
Taroo-be
'(It is) Taro.'
iii. * John-wa Mary-o, Bill-wa Sue-o, ... desu.
John-TOP Mary-ACC, Bill-TOP Sue-ACC be
('(It is) John, Mary; Bill, Sue; ...')
(adapted from Miyagawa 1997a:19, Yoshida 1993:183–185)

Let us begin by looking closely at the configuration in (26), where a *wh*-object is below a universally quantified subject *daremo* 'everyone'. First, a clarification of the datum is in order: Those familiar with the literature on Japanese *wh*/quantifier interactions will recognize (26) as being exactly parallel to a famous example provided by Hoji (1985:270) (*daremo-ga nani-o kaimasitaka?* 'what did everyone buy?'). What made Hoji's example famous was the fact that he rated it as being highly marginal ("??"), a rating which has been reaffirmed by many linguists since. However, Miyagawa (1997a) indicates that the question is only bad on a single answer reading, and becomes fully grammatical when interpreted as a request for a functional answer. Presumably, the reason it is felt to be marginal is that functional readings are not generally the most salient/accessible reading for questions. The improvement of examples like (26) under a functional reading was hinted at by Yoshida (1993) as well; although she rated (a question parallel to) (26) as being highly marginal, she noted that if *dono gakusei-mo* 'every student' is used instead of *daremo* 'everyone', as in (27), the example improves and admits a functional answer.

(27) ? dono gakusei-mo$_i$ dare-o (zibun$_i$-no ie-ni) shootasisita no?
which student-MO who-ACC self-GEN house-to invited Q
'Whom did every student invite (to his house)?'
i. (zibun-no) hahaoya-desu.
self-GEN mother-be
'(It is) his mother.'
ii. Taroo-desu.
Taroo-be
'(It is) Taro.'
iii. * John-wa Mary-o, Bill-wa Sue-o, ... desu.
John-TOP Mary-ACC, Bill-TOP Sue-ACC be
('(It is) John, Mary; Bill, Sue; ...')
(adapted from Yoshida 1993:185)

There is an interesting aspect of the structure of questions like (26) and (27). Recall that much of the discussion in chapter 2 was centered around the fact that neither *-ka* nor *-mo* can intervene along the path of *-ka* movement; in terms of the semantic representation, neither *-ka* nor *-mo* can intervene between the choice function variable left at the launching site of *-ka* and its existential binder in C°. Notice that the question in (26) has an instance of *-mo* between the *wh*-word and the C°, and only one (the functional reading) of two possible readings is allowed. Presuming that our previous conclusions were correct, this datum has an interesting implication: On the functional reading, *-ka* must originate somewhere above *daremo*, since otherwise *-ka* would need to cross *daremo* on its way to the clause periphery. Presumably, what rules out the single-answer reading is that it would require *-ka* to originate *below daremo*, which is ill-formed by virtue of having to (structurally) cross *daremo*. This idea is illustrated in (28) below.

(28) a. * [daremo-ga dare-o t_{ka} aisiteiru] C-ka (single answer)
b. [daremo-ga dare-o aisiteiru] t_{ka} C-ka (functional answer)

The suggestion is that when *-ka* launches from a more internal position, a single-answer reading would result, whereas when *-ka* launches from a point higher in the structure, the result is a functional reading.

Let us see what we can deduce from this. A functional answer requires a binding relationship between a universal quantifier and some aspect of the question word; the choice of *who* is loved varies with the choice of which *who* is loving. The hypothesized compositional constituency of the two readings is illustrated in (29); again, what makes (29a) ungrammatical is the crossing of Q over *-mo*.

(29) a. * C°-ka [daremo-ga [love [dare-o t_{ka}]]] (single answer)
b. C°-ka [t_{ka} [daremo-ga [love dare-o]]] (functional answer)

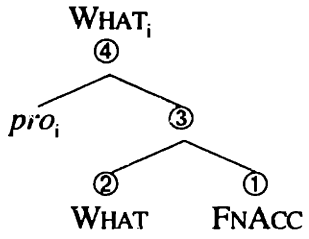
For the functional reading in (29b), it is clear that any binding relation between *daremo* 'everyone' and *dare* 'who' must be established before the trace of *-ka* enters the semantic composition. This suggests that something like a bindable pronoun is introduced into the representation down near *dare* itself, an idea similar to Chierchia's proposal concerning functional *wh*-traces.

I will propose a particular implementation of Chierchia's idea. First of all, note that because we are discussing a *wh*-in-situ language, we are not in fact going to be able to make use of an ambiguity in the type of a *trace*. This is simply because there is no trace, there having been no movement. Instead, we will introduce an ambiguity in the interpretation of the *wh*-word itself; it can either be interpreted in the way we have been treating it so far, or it can be interpreted as an argument of a "functional accessibility" operator, "FnAcc."

(30) $[\![\text{FnAcc}]\!] = \lambda P \lambda x \lambda y \exists F \in D_{ee}.y=F(x) \wedge P(y)$ <et,<e,et>>

The functional accessibility operator takes two arguments. They are a set (e.g., a *wh*-word) and an individual (e.g., a bound pronoun). The functional accessibility operator returns the set of individuals, chosen from the argument set, which are accessible from the value of the pronoun by means of *some* function. I will refer to the set of individuals from a set What that are functionally accessible from the individual *i* as What_i. The details of its semantic compositionality are illustrated below.

(31)

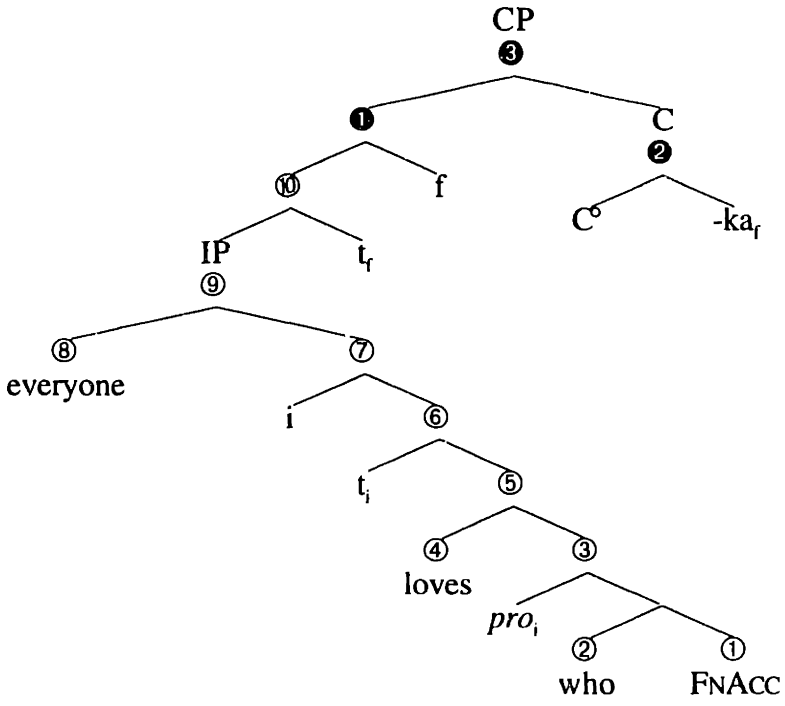


①	$\lambda P \lambda x \lambda y \exists F \in D_{ee}.y=F(x) \wedge P(y)$	<et,<e,et>>
②	$\lambda x.thing'(x) = \text{WHAT}$	<et>
③	$\lambda x \lambda y \exists F \in D_{ee}.y=F(x) \wedge \text{WHAT}(y)$	<e,et>
④	$\lambda y \exists F \in D_{ee}.y=F(i) \wedge \text{WHAT}(y)$	<et>

What FNACC is doing is acting something like a "filter" through which a set is "pushed." In prose, (31) yields the set of all the individuals x from the set WHAT such that, for *some* function (from individuals to individuals, a "Skolem function") F, F maps i onto x. Now, suppose we come to the point where we need to choose a member of WHAT$_i$. Since the members of WHAT$_i$ differ in what function F maps i to $x \in$ WHAT, to identify a member of WHAT$_i$ (that works for any value of i, in the case where i is an as-yet-unbound variable), we must specify F.

We now have all of the pieces in place to derive the functional reading of (26). The derivation is performed below.

(32)



① $\lambda P\lambda x\lambda y\exists F\in D_{ee}.y=F(x) \wedge P(y)$ <et,<e,et>>

② $\lambda x.person'(x) = \text{WHO}$ <et>

③ $\lambda y\exists F\in D_{ee}.y=F(i) \wedge \text{WHO}(y)$ <et>

④ $\lambda y\lambda x\lambda w.loves'(x,y)(w)$ <e,ep>

⑤ $\lambda P\exists F\in D_{ee}.P=[\lambda x\lambda w.loves'(x, F(i))(w)] \wedge \text{WHO}(F(i))$ <ep,t>

⑥ $\lambda p\exists F\in D_{ee}.p=[\lambda w.loves'(i, F(i))(w)] \wedge \text{WHO}(F(i))$ <pt>

⑦ $\lambda P\exists F\in D_{ee}.P=[\lambda x\lambda w.loves'(x,F(x))(w)] \wedge \text{WHO}(F(x))$ <ep,t>

⑧ $\lambda P\lambda w\forall x\in \text{WHO}.P(x)(w)$ <ep,p>

⑨ $\lambda p\exists F\in D_{ee}.p=\lambda w\forall x\in \text{WHO}.[loves'(x, F(x))(w)] \wedge \text{WHO}(F(x))$ <pt>

⑩ $f(\lambda p\exists F\in D_{ee}.p=\lambda w\forall x\in \text{WHO}.[loves'(x, F(x))(w)] \wedge \text{WHO}(F(x)))$ <p>

❶ $\lambda f.f(\lambda p\exists F\in D_{ee}.p=\lambda w\forall x\in \text{WHO}.[loves'(x, F(x))(w)] \wedge \text{WHO}(F(x)))$ <cp>

❷ $\lambda p_c\lambda p\exists f[p=p_c(f)]$ <cp,pt>

❸ $\lambda p'\exists f.p'=$
$f(\lambda p\exists F\in D_{ee}.p=\lambda w\forall x\in \text{WHO}.[loves'(x,F(x))(w)] \wedge \text{WHO}(F(x))))$
$= \lambda p\exists F\in D_{ee}.p=\lambda w\forall x\in \text{WHO}.[loves'(x,F(x))(w)] \wedge \text{WHO}(F(x))$ <pt>
[see (18)]
(= ⑨)

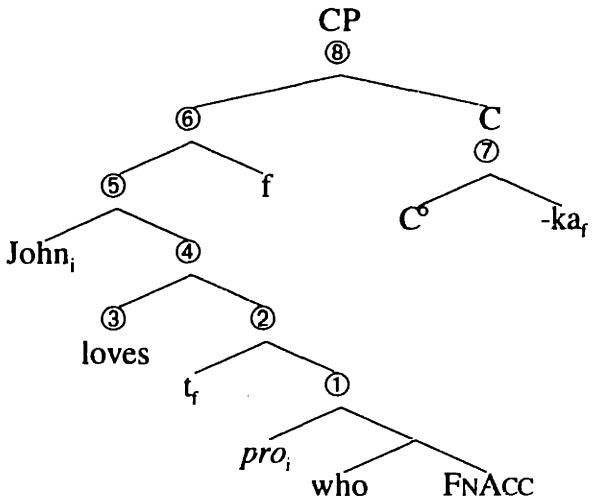
In prose, what we end up with after the above derivation is the following: A set of propositions of the form *everyone$_x$ loves F(x)*, where *F* is a Skolem function which maps people to people. To answer the question is to choose a proposition, and the way the propositions are differentiated is by which function *F* occurs in it. Thus a function like *F* = mother-of' would pick out an answer to the question.[13]

[13] This hints at a view of answerhood that says that an answer needs (only) to specify something which uniquely picks out one of the propositions in the answer set. The fact that *A picture by whom sold for $1 million dollars?* can be answered with *Picasso*, while *Whose mother left?* cannot (but rather must be answered with something like *Picasso's*) indicate that it must also be limited by morphological well-formedness. There are almost certainly additional constraints, but we will set these issues aside here.

We introduced the "functional accessibility operator" FNACC in order to derive the functional meaning above, but we need also to consider two further cases. First, since FNACC has no overt realization,[14] we should consider what would happen if FNACC were to appear in a simple single-*wh*-question without a quantifier. Second, we should consider the consequences of having a quantifier/*wh*-question like (32) except *without* an instance of FNACC.

In the first scenario (FNACC in a question without a quantifier), FNACC introduces a bound pronoun which must be bound by something other than a quantifier, e.g., by a proper name. Anticipating the results of a discussion in chapter 8, we will suppose that *-ka* is not (semantically) introduced until *after* the pronominal argument of FNACC is bound; that is, we will suppose that *-ka* launches from a position above the subject.[15] The semantic derivation is as shown below:

(33)



①	$\lambda y \exists F \in D_{ee}.y=F(John') \wedge WHO(y)$	<et>
②	$f(\lambda y \exists F \in D_{ee}.y=F(John') \wedge WHO(y))$	<e>
③	$\lambda y \lambda x \lambda w.loves'(x,y)(w)$	<e,ep>
④	$\lambda x \lambda w.loves'(x,f(\lambda y \exists F \in D_{ee}.y=F(John') \wedge WHO(y)))(w)$	<ep>
⑤	$\lambda w.loves'(John',f(\lambda y \exists F \in D_{ee}.y=F(John') \wedge WHO(y)))(w)$	<p>
⑥	$\lambda f \lambda w.loves'(John',f(\lambda y \exists F \in D_{ee}.y=F(John') \wedge WHO(y)))(w)$	<cp>
⑦	$\lambda p_c \lambda p \exists f[p=p_c(f)]$	<cp,pt>
⑧	$\lambda p \exists f[p=\lambda w.loves'(John',f(\lambda y \exists F \in D_{ee}.y=F(John') \wedge WHO(y)))(w)]$	<pt>

The result of the above derivation is essentially a set of propositions of the form *John loves F(John)*, varying in the value of *F*. There is a choice function involved,

[14] I have not run across any evidence to suggest that FNACC *ever* has a phonological realization, crosslinguistically. This might suggest that FNACC is a strictly *interpretive* option, rather than something which is syntactically present. However, a later discussion of FNACC in chapter 8 will show that FNACC seems to be able to enter the derivation *in place of* Q, which suggests that FNACC is an active syntactic object. I will continue to assume the latter view (that FNACC is, essentially, part of the numeration), although the former possibility is worth keeping in the backs of our minds.

[15] This structure suggests certain predictions, which I have not been able to check. For example, if *-ka* is not introduced until the pronoun is bound, we might be able to obviate certain intervention effects that would otherwise occur (e.g., if an intervenor is located between the binder of FNACC's pronoun and the its *wh*-word argument).

choosing one member of the set *F(John)* for different values of *F*, but as mentioned before, the way to identify which choice was made (i.e. which value *f* took on) is by specifying the value of *F* (since the values *f* chooses among vary only in the value for *F*). The meaning of this question should be something akin to 'What is the function *F* from individuals to individuals that maps John to the person he loves?' A response to this question might be to specify such an *F*, like mother-of' ("*his mother*"). To put this another way, the expectation is that a simple *wh*-question that makes use of FNACC will be asking for a functional answer.

The second scenario we were going to consider is one where no FNACC appears in a quantifier-*wh*-question. We saw in (32) that we get a functional reading with the FNACC operator, but what happens if FNACC is omitted?

Anticipating a conclusion from chapter 8, it will turn out that with no FNACC present, Q could not have been introduced as high in the structure as it was in (32). Instead, the Q-introduction Antisuperiority generalization (from chapter 3, but as interpreted in chapter 8) would force Q to be base-generated as a sister to the *wh*-word. If this happens (in Japanese), *-ka* will have to travel across *daremo* 'everyone' on its way to the clause periphery, causing the standard intervention effect and ruling out the structure.

To wrap up this section, the proposal is that FNACC is an optional device, employed when a functional answer is desired (e.g., in a quantifier-*wh*-question). If FNACC is employed in a single-*wh*-question without a quantifier, it results in a "functional" question asking not about an individual but about a function (which takes an individual as an argument).

4. *Wh*-scope and long-distance lists

We know from earlier discussions that *wh*-words can "take scope" at clauses other than the clause in which they are base generated. To give a simple example from English, we know that *what* in both (34a) and (34b) is logically the embedded object, but it can be associated either with the matrix clause (forming a direct question) or with the embedded clause (forming an indirect question).

(34) a. What did John say I bought?
b. John knows what I bought.

This is not particularly mysterious in the semantic system that we have been developing here; (34a) and (34b) differ in the location of the interrogative complementizer, and hence, the location to which Q—which contributes the existential quantification over choice functions—moves. The logical representations would be something like (35).[16]

(35) a. λp∃f[p=said'(John', I-bought'(f(WHAT)))]
b. knows'(John', λp∃f[p=I-bought'(f(WHAT))])

[16] In chapters 2 and 4 we saw evidence that *-ka* moves successive cyclically, but that would only trivially affect the semantics here and is therefore ignored in the representations.

Things begin to get more interesting when there are two interrogative clauses. It has long been known that it is possible for *wh*-words which are generated in the same clause to "take scope" in two different clauses. As Baker (1970) pointed out, (36) has two readings, which can be characterized by the two answers given in (36a–b).

(36) Who knows where we bought what?
  a. John knows where we bought what. (So why don't you go ask *him*...!?)
  b. John knows where we bought the footstool,
     Bill knows where we bought the endtable and
     Mary knows where we bought the loveseat.

These two answers are described in terms of two different "scope" options for *what*. If *what* "takes matrix scope" (with *who*), the result is a request for a list of pairs (36b); if *what* "takes embedded scope" (with *where*), the result is question involving embedded pairs.

The problem with this interpretation of the "matrix-scope-*what*" reading is that it either suggests (a) that *what* can move out of a *wh*-island (if scope is assigned by movement), or (b) that *what* can be bound by an interrogative complementizer other than the closest one (if scope is assigned by binding).

Dayal (1996) points out that the phenomenon we see in the English question (36) occurs crosslinguistically, even in languages which appear to be otherwise strict about disallowing *wh*-words to take scope out of the most immediate interrogative clause. For example, in Japanese (37a), *nani* cannot take scope outside of the embedded interrogative clause; yet if the matrix subject is a *wh*-word, as in (37b), the "matrix *what*" reading is available (just as in English).[17]

(37) a. Tanaka-kun-wa [Mary-ga doko-de nani-o katta ka]
  Tanaka-TOP Mary-NOM where-LOC what-ACC bought Q
  sitte-imasu ka?
  know Q
  'Does Tanaka know where Mary bought what?'
  * ('What does Tanaka know where Mary bought *t*?')

  b. dare-ga [Mary-ga doko-de nani-o katta ka]
  who-NOM Mary-NOM where-LOC what-ACC bought Q
  sitte-imasu ka?
  know Q
  'Who knows where Mary bought what?' (Dayal 1996:92–3)

Dayal also points out that Bulgarian, a language which moves all of its *wh*-words to clause-initial position, renders the question from (36) as (38). What is interesting about (38) is that both *wh*-words from the embedded clause *remain* in the embedded clause, yet (38) has the

[17] Nishigauchi (1998:17), while agreeing with the judgment that Dayal reports, indicates that some Japanese speakers need to stress both *dare* 'who' and *nani* 'what' in (37b) to get the list reading. Nishigauchi also notes that reversing the *wh*-phrases and/or the stress allows a long-distance list that pairs *who* and *where* instead of *who* and *what*, although the details are not made fully clear.

same kind of "matrix *what*" (matrix pair-list) reading that English (36) has.[18] This suggests strongly that moving the embedded *wh*-word into the matrix clause is *not* a prerequisite for getting the long-distance list reading.

(38) koj znae [kakvo kude e kupila Mariya] ?
who knows what where has bought Maria
'Who knows where Maria bought what?' (Dayal 1996:91, Marina Todorova, p.c.)

Dayal, recognizing the need for some means of getting a "long distance list" (the "matrix *what*" reading) without recourse to any direct long-distance association between an embedded *wh*-word and a matrix *wh*-word, proposes an account which derives this reading through an interaction of the whole embedded clause with the matrix interrogative. The proposal here is also roughly in this vein.

An important observation that Dayal makes is that the embedded clause must be a multiple-*wh*-question in order to get a long-distance list reading. In fact (although this is hard to verify intuitively, since it turns out to be somewhat analysis-internal), the embedded multiple-*wh*-question must have a pair-list reading (rather than a single-pair reading). Notice that a question like (39) cannot be answered with a list of woman-book pairs, which we attribute to the fact that it has only a single-*wh*-question as its embedded clause.

(39) Which woman knows which book Mary bought?

As it happens, the basic principles of the system developed so far already predict the existence of long-distance lists. To see why, consider first the fact that question-embedding verbs like *know* can take both single and multiple-*wh*-question (pair-list) complements (40).

(40) a. Dale knows who killed Laura Palmer.
b. Dale knows which deputy likes which donut.

As discussed in section 1, pair-list and single-answer questions differ in their semantic *type*; specifically a single-answer question is of type <pt> (a set of propositions), while a pair-list question is of type <pt,t> (a set of questions, i.e. a set of sets of propositions). The facts in (40) tell us that *know* is capable of taking complements of *either* type. To sidestep the issue of how to relate these two versions of *know*, I will simply interpret this as homophony; $know_1$ takes a <pt> complement, and $know_2$ takes a <pt,t> complement.[19]

Now, consider question (36) again. Interpreting *know* as $know_2$, we expect a meaning like (36a) straightforwardly enough. But what happens if we interpret *know* as

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[18] Marina Todorova (p.c.) tells me that it is possible, though somewhat marginal, to front the embedded *wh*-word into the matrix clause (in Bulgarian), as in (i). Doing so *forces* the long-distance list reading.

(i) ? koj kakvo znae kude e kupila Mariya?
who what knows where has bought Maria
'Who knows where Maria bought what?' (*who-what* pairs only) (Marina Todorova, p.c.)

[19] It is of course obvious that homophony is not the *right* analysis of this; as far as I know, it is *crosslinguistically* possible for these verbs to take both single- and multiple-*wh*-complements. I only say "homophony" in order to avoid actually formulating the type-shifting rule which gets us from $know_1$ to $know_2$.

know$_1$? We've said that *know*$_1$ takes a complement of type <pt>, but here it would be presented with a complement of type <pt,t>. Of course, we *have* a way to interpret such representations; this is the canonical situation in which flexible functional application applies.

The embedded question in (36) is *Where did we buy what?* Notice that in this question, it is *what* which must be exhausted. This is most easily detected when embedded; if I need to know where we bought what, then I need to know a place for each thing, but not necessarily a thing for each place.[20] Thus, the representation of this (pair-list) question would be as in (41), where α, β, etc. are members of WHAT.

(41) {*Where did we buy α?, Where did we buy β?, ...*}

Now, suppose we embed (41) under the question *Who knows...?* using *know*$_1$ (remember: *know*$_1$ takes a <pt> complement, thus triggering flexible functional application). This is shown in (42).

(42) (*know*$_1$ ({*Where did we buy α?, Where did we buy β?, ...*}))(f(WHO)) =

{*know*$_1$(*Where did we buy α?*), *know*$_1$(*Where did we buy β?*), ...}(f(WHO)) =

{*know*$_1$(*Where did we buy α?*) (f(WHO)),
know$_1$(*Where did we buy β?*) (f(WHO)), ... } =

{*Who knows where we bought α?, Who knows where we bought β?, ...*}

As shown above, we apply *know*$_1$ to each member of the set of questions in turn, creating a set of predicates which is then applied to the subject (which we take to be *f*(WHO), supposing that Q cannot be introduced as a sister to the embedded question), and, in the end, we end up with a set of questions. Specifically, we end up with the set of questions *Who knows where we bought x?* for all of the *x*'es in WHAT. This has the standard representation for a pair-list multiple-*wh*-question, and it has the effect of pairing up the matrix *who* with the embedded *what*, just as meaning (36b) describes.

Notice too that by deriving the long-distance list reading in the way we just did, we predict that it is the embedded *what* which is "exhausted" in the list answer. This is because it is the sethood of *what* that is generating the multiple question. Empirically, as Dayal (1996:133) observes, this is the correct result. That is, in responding to the question *Who knows where we bought what?*, an answer must be given for each *thing* bought not for each *person* who knows about some buying event. This is a problem for Dayal's account because it requires a kind of WCO violation; for her, in the question *Which woman knows where we bought which book?*, *which book* must (in some sense) bind *which woman*, but in order for this binding relation to be possible, *which book* would have to be moved over *which woman*—causing a WCO violation. To handle this, Dayal has to make some special assumptions about what triggers WCO violations, but under our account, the data follow straighforwardly. There is no WCO violation because there is no binding

[20] Conversely, if I need to know what we bought where, I need to know a thing for each place.

involved; the exhaustivity effect is due to a *wh*-word propagating its own sethood through the semantic representation.

All in all, this is a fairly tidy result. There are many details left open, which will unfortunately have to be left to future work. Let me mention one. A major point made by Dayal (1996) about long-distance list readings is that they are subject to certain locality restrictions. In particular, they appear to be unable to escape tensed clauses. So far, nothing in the system we have developed above predicts this, although it is predicted on Dayal's account by the clauseboundedness of QR. Our account of long-distance lists makes crucial use of the propagation of sets via flexible functional application, and so to account for Dayal's observation, we might look for restrictions on locality of set-propagation of this sort. One approach which may hold promise is to compare the characteristics of flexible functional application to the characteristics of plurals (e.g., Link (1983)'s "*" operator which bears a certain similarity in function to flexible functional application). If we find that propagation of pluralization is clausebound, we may be able to extend the result to flexible functional application. This task, however, is left for a later time.[21]

5. Chapter six synopsis

In this chapter, we tackled multiple *wh*-questions and functional readings of questions with quantifiers.

The first issue we addressed in this connection is what the semantic representation of the "pair list" reading should be. The proposal was that pair list readings arise from *sets* of questions, and as part of this proposal we posited the following (essentially pragmatic) rules of interpretation.

(4) *Single Question Recognition*
If the semantic value of an utterance is of type <pt> (a set of propositions), then the utterance is a (single) question.
To respond: (a) one proposition from the set is selected,
or (b) the presupposition (that there is an answer) is denied.

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[21] Beck (1998) gave examples (incidental to her analysis) like those in (i) below, which do suggest a kind of clause-boundedness of plural propagation.

(i) a. Brett and Karen read books that came to different conclusions.
b. Brett and Karen said that John read books that came to different conclusions.
c. Brett and Karen left after John read books that came to different conclusions.

In (ia), the partition on *books* can be mapped to partitions of *Brett and Karen*, such that Brett read books with conclusions that differ from the conclusions in the books that Karen read. In (ib), however, this reading is unavailable; (ib) can only mean that John read conflicting reports, according to Brett and Karen. Assuming that the plurality of *books* (with the contrasted partitions evoked by *different*) must be local to the plurality of *Brett and Karen*, (i) suggests that the intervening clause boundary blocks propagation of this plurality. Also, it appears that this reading (at least marginally) returns in (ic), where there is no clause boundary. Notice that the plurality is in an adjunct island in (ic), which suggests that (a) plurality can propagate out of islands (like flexible functional application), and (b) that plurality-propagation is not dependent on QR (which cannot get out of such islands; compare (ic) to (ii), for which the *every>some* reading is quite difficult). Clearly, more systematic work is needed here.

(ii) Some administrator called after John met every student.

(5) *Multiple Question Recognition*
If the semantic value of an utterance is of type <pt,t> (a set of questions), then the utterance is a (pair-list multiple) question.
To respond: For each member set *A*,
(a) one proposition from the set *A* is selected,
or (b) the presupposition (that there is an answer in *A*) is denied.

We saw that flexible functional application (introduced in chapter 5) was crucial to both the derivation of pair-list readings and to single-pair readings for questions without Q. Recall that multiple questions in Japanese can occur without a Q marker and nevertheless be interpreted as questions. Flexible functional application predicts that such questions should exist, and moreover correctly predicts that they are limited to a "single pair" reading.

We also make crucial use of flexible functional application in deriving the pair-list reading of multiple *wh*-questions. On the proposal made in this chapter (building on the Pair-list Antisuperiority generalization of chapter 3), a pair-list reading arises from Q having one *wh*-word in its domain but not another. The *wh*-word outside the scope of Q has a set as its semantic value, and, with the help of flexible functional application, yields a set of questions. Multiple Question Recognition then interprets this as a pair-list question.

As a technical detail of the proposal, we also needed to assume the following "flexible version" of λ-abstraction that allows λ-abstraction over a set to translated as λ-abstraction over each member of the set. The definition of flexible λ-abstraction is repeated below.

(13) FLEXIBLE LAMBDA-ABSTRACTION

$$[\![\lambda i.\varphi]\!]^g = \lambda A \exists \phi.A=[\lambda x.[\![\phi]\!]^{g[i\rightarrow x]}] \wedge \forall x.[\![\phi]\!]^{g[i\rightarrow x]} \in [\![\varphi]\!]^{g[i\rightarrow x]}$$

where a) φ is a set (type <μt>), b) the result is composable.

The proposals made in this chapter provide the semantic foundation for the Pair-list Antisuperiority generalization; the semantic representation can only turn out to be a set of questions where at least one of the *wh*-words is outside the domain of Q (i.e. not in the scope of the choice function).

The second half of this chapter was concerned with the "functional reading" of questions. Following an important observation made by Miyagawa (1997a), we deduced (based on the syntactic discussions of chapters 2–3) that functional readings (at least in Japanese, and presumably more generally) arise from structures in which Q is introduced compositionally outside the quantifier. This was illustrated in (29b), repeated below, where *daremo* 'everyone' is below the base position (t_{ka}) of Q (*-ka*).

(29) b. C°-ka [t_{ka} [daremo-ga [love dare-o]]] (functional answer)

This necessitated an analysis in which *dare* 'who' can be interpreted as the set WHO_i, derived through the use of the "functional accessibility operator" FNACC (whose definition is repeated below). FNACC takes a set (e.g., WHO, the set of human individuals) as one argument, and an individual (e.g., the bound individual variable *i*) as its other argument,

returning the set of individuals which are "functionally accessible" (by some function *F* from individuals to individuals) from *i*.

(30) $[\![\text{FNACC}]\!] = \lambda P \lambda x \lambda y \exists F \in D_{ee}.y=F(x) \wedge P(y)$ <et,<e,et>>

The last issue we tackled was the question of how to derive what Dayal (1996) labeled "long-distance lists." These arise in questions with two interrogative clauses, the lower of which has two *wh*-words and the higher of which has one (the configuration Dayal (1996) refers to as a "*wh*-triangle"). In such cases, the observed fact is that they can in general (and crosslinguistically) be answered by listing values for one of the matrix *wh*-words and one of the embedded *wh*-words. In English, these are cases like *Who knows where we bought what?* which (as observed by Baker 1970) can be answered with lists like *John knows where we bought the beer, Mary knows where we bought the charcoal, and Bill knows where we bought the lighter fluid.*

We saw that the availability of this reading follows from the juxtaposition of two previously introduced elements of our analysis of questions: the semantic representation of pair-list multiple questions being *sets* of questions, and the availability of flexible functional application as a mode of semantic composition. Verbs like *know* can embed either single or multiple questions, each of which has a different semantic type (single questions being set of propositions, and [pair-list] multiple questions being sets of questions, or *sets of* sets of propositions). If the single-question version of *know* gets an embedded *multiple* question as an argument, flexible functional application will generate a set of questions. This set is then interpreted (via Multiple Question Recognition) as a pair-list multiple question, effectively pairing the matrix *wh*-word with the embedded *wh*-word that was outside the scope of Q.

The main point of this chapter was to introduce a proposal for the representation of pair-list multiple questions (as sets of questions), and outline an analysis of functional questions. In the next chapter, we will turn to the last major hurdle, pair-list readings for questions with quantifiers.

Chapter 7 Pair-list readings of quantifier/*wh*-questions

In the previous chapter, we addressed the *functional* reading of *wh*-questions involving quantifiers, but there is also another reading that such questions can (usually) get which involves listing off propositions. The answer exhibited in (1b), repeated below, is an example of this "pair-list" reading.

(1) What did every man (in this group) buy?
  a. Coffee.
  b. John bought a cake, Fred bought a pail, and Joe bought some rice.
  c. His mother's Earth Day present.

This chapter is devoted to investigating the semantics of questions which receive these "pair-list" answers. In the first section, we will be primarily concerned with evidence that the pair-list reading constitutes a distinct semantic *type* from the other question readings. The technical details of how to work out the formal semantics will be covered in the following sections.

1. Evidence for a quantificational type

Intuitively, when answering a question like (1) with (1b), we feel that we are actually answering a series of questions, which can be paraphrased as something like (2).

(2) For every man (in this group) x, what did x buy?

That is, it feels as if the quantifier has in some way taken scope over the question. We can fortify this intuition by noting that, while pair-list answers work for quantifiers like *everyone*, they are not available if the quantifier is something like *nobody* or *few men*. This is demonstrated by the following examples, (3) and (4).

(3) What does no man (in this group) like?
  a. Coffee with salt.
  b. * John likes cake, Fred likes pails, and Joe likes rice.
  * John doesn't like cake, Fred doesn't like pails, and Joe doesn't like rice.
  c. His Visa bill.

(4) What does almost every man (in this group) lack?
  a. Common sense.
  b. * John lacks money, Fred lacks time, and Joe lacks rice.
  * John doesn't lack money, Fred doesn't lack time, and Joe doesn't lack rice.
  c. His father's wisdom.

Now, consider the paraphrases of these hypothetical pair-list readings in (5). Higginbotham (1993:212) comments that questions like (5a) should be answerable by responding for no man—that is, by saying anything (or perhaps nothing) at all. As for

what is wrong with (5b), it feels as if what is being asked is not well-defined; how many answers would be sufficient, as well as which particular instances of *x* are to be answered for, is left underspecified.[1] We will return in section 3 to the question of how these readings are ruled out technically.

(5) a. # For no man *x*, what does *x* like?
b. ?# For almost every man *x*, what does *x* lack?

The claim of this section is that the pair-list reading of quantifier/*wh*-questions of this kind have a structure very much like the paraphrase in (2). That is, pair-list questions have their own distinguishable semantic type, being in essence a quantifier over questions.[2] The most striking evidence for this view comes from the scope interactions of embedded questions. This phenomenon has been discussed by Moltmann & Szabolcsi (1994), Sharvit (1996), and Nishigauchi (1998).

Under normal conditions, movement of quantifiers by means of QR cannot escape embedded (finite) clauses. Thus, while (6b–c) are ambiguous between readings where *some professor* takes scope over *every student* and vice-versa, (6a) is unambiguous. The explanation that is commonly given is that for *every* to have scope over *some*, it must move (covertly) by means of QR, a type of movement which cannot cross finite clause boundaries.

(6) a. Some professor found out that every student cheated on a test. (∃>>∀)
b. Some professor wanted every student to cheat on a test. (∃<>∀)
c. Some student cheated on every test. (∃<>∀)

Moltmann & Szabolcsi (1994) notice that a quantifier inside an embedded *wh*-phrase *does* seem to be able to outscope a matrix quantifier despite the intervening clause boundary. For example, in (7) a reading in which the librarians vary with the boys is available.

(7) Some librarian (or other) found out which book every boy needed. (∃<>∀)

Sharvit (1996) points out that examples like (7) are in fact three-ways ambiguous, since if *some* has wide scope, both functional and pair-list readings are available in the embedded question. That is, when there is only a single librarian involved, that librarian might have discovered either an arbitrary pairing between boys and books, or a functional connection between boys and books, e.g. that every boy needed the textbook for his first-period class. Sharvit's own example (8) may make these readings more easily distinguishable.

(8) Some professor found out which woman every student dated. (∃<>∀)

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[1] Many issues arise here that I am disregarding. For example, the discussion in the text basically excludes "mention some" readings, for which it is possible to give an incomplete answer. These types of readings will not be addressed in this thesis. For discussion, see, e.g., Groenendijk & Stokhof (1984).

[2] Dayal (1996) makes a similar claim for multiple-*wh*-questions, based in part on the readings available in a particular configuration which she refers to as the "*wh*-triangle" (involving a matrix *wh*-word and an embedded multiple-*wh*-question). This was discussed at the end chapter 6.

Where *some* has wider scope in (8), it can either mean that Professor X discovered a list of student-woman dating pairs, or that Professor X discovered that, say, every (relevant) student$_i$ dated his$_i$ chemistry tutor.

The two readings just mentioned do not violate the clauseboundedness of QR, since *some* still outscopes *every*. However, where *every* takes scope over *some*, only one reading—the pair-list reading—is available inside the *wh*-clause. Because the functional and pair-list readings are somewhat difficult to distinguish in (7), consider the wide-scope-for-*every* reading of (8). It can't be that every student$_i$ dated his$_i$ chemistry tutor and that for each student a different professor found out about it (without necessarily having a means of identifying of the relevant woman). Instead, what (8) must mean (on the $\forall > \exists$ reading) is that, for each of the student-woman dating pairs, a different professor knows that pairing.

The intuitions here are admittedly somewhat difficult, but the point is this: The availability of wide scope for a quantifier inside a *wh*-complement appears to be dependent on the pair-list reading of the embedded *wh*-clause. This can perhaps be tested more directly by considering examples which preclude pair-list readings, like the cases where the quantifier is *nobody* or *almost everyone* instead of *everyone*. As Moltmann & Szabolcsi (1994) observe, such examples lack the relevant readings; in (9) ((9a) is Sharvit's example), it is not possible for professors to vary with the students.[3]

(9) a. Some professor found out which woman no student dated. ($\exists$>>*no*)
b. Some professor found out which woman almost every student dated. ($\exists$>>*almost every*)

We can round out the paradigm by observing that (10) lacks the inverse scope reading; although *every* is contained within a *wh*-complement, it is not free to take arbitrarily wide scope. Because a finite clause boundary intervenes in (10), scope is fixed with *some* outscoping *every* (although both pair-list and functional readings are available for the embedded question).

(10) Some professor found out that I know which woman every student dated. ($\exists$>>$\forall$)

It is as if the *wh*-complement as a whole, when it receives the pair-list reading, can function like a quantifier. In particular it appears to be able to take scope over clausemate quantifiers. The account we will give (which essentially follows the ideas of Moltmann & Szabolcsi 1994, Sharvit 1998, as well as Dayal 1996) is that a pair-list *wh*-complement *is* in fact a quantifier, subject to QR like other quantifiers. In the cases above where a quantifier inside a *wh*-complement outscopes a matrix quantifier, it is due to the entire *wh*-complement QR'ing to a position above the matrix quantifier.

If these readings are really due to this kind of "massive QR" of entire clause-size objects, we make certain binding predictions as well. For example, we should find that if the *wh*-complement would cause a Principle C violation if interpreted in situ, the inverse

[3] It appears that not everybody agrees with these judgments, but those reported above seem to accurately reflect my own judgments.

scope reading should be forced. Of course, with added complexity comes added difficulty in judging, but the contrast seems to be as predicted. That is, (11a) appears to have *only* the reading in which the professor varies with John's friends. This is parallel to the example in (11b) which does not contain a *wh*-complement but shows essentially the same fact for a regular quantifier.

(11) a. Some professor asked him$_i$ which woman every one of John$_i$'s closest friends dated. (∀>>∃)

b. Some professor asked him$_i$ about every one of John$_i$'s closest friends. (∀>>∃)

What we conclude from the foregoing discussion is that there is something quantificational about the pair-list reading of quantifier/*wh*-questions. The question we will address in the next section is what that quantificational something is, formally.

2. Lifted questions and Laziness

In the previous section, we saw evidence that *wh*-complements (containing a quantifier) which receive a pair-list reading behave as if they themselves are quantificational, thus subject to QR. In this section, we will try to work out what this means from a technical standpoint.

The basic approach we are going to take is that pair-list readings involve "quantification into questions." That is, the paraphrase *For every man x, what does x like?* is taken to be a fairly accurate characterization of the pair-list meaning. The legitimacy of quantifying into questions has been the subject of considerable debate in the existing literature on the semantics of questions, but I will not be able to do justice to the full range of existing arguments here. Rather, the goal will be to propose a plausible system which works.

To make the issue explicit, let us first consider how we might derive the semantic value of *everyone walks*. The standard semantics of *everyone* makes it a function from predicates (type <ep>) to propositions, as given in (12). In essence, this means that *everyone* takes *walks* as an argument, returning a true proposition if *walks* is true of all (contextually relevant) people in WHO.[4]

(12) $[\![\text{everyone}]\!] = \lambda P \lambda w \forall x \in \text{WHO}.P(x)(w)$ <ep,p>

Questions are sets of propositions under the view we have been endorsing here, and so to quantify into a question we would need *everyone* to apply to something which, given an individual, returns a question. That is something like the second part of the pair-list paraphrase used above: *for x, what does x like?* The idea is that *everyone* should contribute universal force, so that we would get *for every x, what does x like?* as a result. However, the definition for *everyone* given in (12) is not suited to the task. For one thing,

[4] Here, I am using the notation WHO to mean the set of (contextually relevant) people, the same set we referred to in chapters 5 and 6 in our discussion of questions.

it takes an argument of type <ep>, when what we need is for it to take an argument of type <e,pt> (the aforementioned function from individuals to questions).

Let us tackle the question by considering where we want to end up. It should not escape our notice that the "pair-list" answer (13c) that responds to a question with a *wh*-word and a universal quantifier (13a) takes the same form as the "pair-list" answer previously discussed in the context of multiple-*wh*-questions like (13b).

(13) a. What did everyone buy?
b. Who bought what?
c. John bought pretzels, Mary bought hot dogs, and Bill bought lighter fluid.

Recall that in chapter 6 it was proposed that the pair-list reading of a multiple question like (13b) arises from a set of questions, each of the form *What did x buy?* for all of the (contextually relevant) *x*'s in WHO. As a starting point, we might suppose that the pair-list reading of the quantifier/*wh*-word case has roughly the same form. That is, the semantic value of the pair-list reading of a quantifier/*wh*-question is a something like set of questions, one question for every value taken on by the quantifier's variable.

Groenendijk & Stokhof (1984, ch. 6) connect the issue of quantifying into questions with the issue of coordination of questions in an interesting and revealing way. They start by considering the simple case of coordination of proper names. Suppose for the moment that proper names are of type <e>,[5] and we wish to conjoin two proper names. Given the well-formedness of all three examples in (14), we have a potential dilemma. If *walked* always takes an argument of type <e>, this implies that *John and Mary* in (14c) must be of type <e>. But what kind of individual is *John and Mary*? And how does the truth of (14c) imply the truth of (14a–b)?

(14) a. John walked.
b. Mary walked.
c. John and Mary walked.

The problem can be dealt with by "type lifting" the proper names from type <e> individuals to type <ep,t> sets of properties of individuals (an approach which has a fairly long history, most directly traceable in this form to Rooth & Partee 1982). The procedure for doing this is reasonably straightforward; it amounts to considering *John* to be the set of properties which hold of John.[6]

(15) $[\![[_{lift}$ John $]]\!] = \lambda P.P(John')$ <ep,t>

[5] There are all sorts of issues about whether treating proper names as being of type <e> is fully adequate, but the resolution of most of those issues do not affect the point being made.

[6] A word about "properties" is in order. I have not usually explicitly differentiated intensional and extensional properties, but it is clear that when "lifting" *John* we need to consider the *intensional* properties of *John*. That is, a "property" which is a function of type <e,st>, a function from individuals to propositions. Such a property *P* is only true or false of *John* given an evaluation world. So, any such property that is even *defined* for *John* will be in the "lifted" *John*, regardless of which evaluation world will be applied later. I mention this because if we used an *extensional* notion of property, *John* would have different properties in different possible worlds (making identifying *John* in another possible world by means of a set of properties impossible in principle). However, intensional properties are world-invariant, being functions which take a possible world as an argument.

In this fashion, we can evaluate *John and Mary* as the conjunction of John's properties and Mary's properties—that is, as the properties which hold of both John and Mary. If *walked* is in that set, then (14c) is true, and for *walked* to be in that set, both (14a) and (14b) must have been true. The effect that type lifting had in (14) was to reverse the direction of the function-argument relation (dubbed "function-argument flip-flop" by Partee & Rooth 1983); the lifted type of *John* takes *walked* as its argument (returning true if *walked* is a property of *John*) as in (16b), rather than *walked* taking the individual *John* as its argument (returning true if *John walked* is true) as in (16a). The truth conditions are of course the same.

(16) a. John′ λxλw.walk′(x)(w)
b. (λxλw.walk′(x)(w)) λP.P(John′)

Groenendijk & Stokhof point out that we can just as well lift questions, and in fact we need to in order to account meaningfully for conjoined questions. If we try to represent the conjoined question in (17a) by intersecting the two sets of propositions as in (17b), the result would be the empty set (except under the unhelpful circumstances that John and Mary are the same person).

(17) a. Who does John love and who does Mary love?
b. NO (λp∃x.p=love′(John′,x)) ∩ (λp∃x.p=love′(Mary′,x))
= Ø unless John′ = Mary′
c. YES (λQ.Q(λp∃x.p=love′(John′,x))) ∩ (λQ.Q(λp∃x.p=love′(Mary′,x)))
= λQ.Q(λp∃x.p=love′(John′,x)) ∧ Q(λp∃x.p=love′(Mary′,x))

On the other hand, we can intersect *lifted* questions, which are sets of properties that hold of questions, as in (17c), yielding a set of properties that holds of both questions.[7] A question is of type <pt>, making properties of a question of type <pt,t>. A set of such properties (like (17c)) is thus of type <<pt,t>,t>. We are now faced with the issue of what to do if the semantic value of an utterance ends up being such a high type.

Departing from the discussion in Groenendijk & Stokhof (1984) now, notice that the question in (17a) shares with (our interpretation of) pair-list multiple-*wh*-question the property of representing in discourse a series of questions each of which must be answered. If we stick to the representation discussed in chapter 6, this means that we want (17a) to end up being evaluated as a set of questions containing *Who does John love?* and *Who does Mary love?* as its only two members. Let us refer to this set which we after as Q_{17}. In the terminology used above, Q_{17} can also be characterized as being a property of questions, true for both *Who does John love?* and for *Who does Mary love?* but false for all other questions. As a property of questions, Q_{17} will be in the set described in (17c). There are other members of the set described in (17c), but *all of these members contain Q_{17} as a subset.* This is true because any member of the set (17c) must be a property that holds (at least) both of *Who does John love?* and *Who does Mary love?*, so all members

[7] I am treating properties of questions extensionally because it is not clear that intensionality is necessary. Perhaps for consistency with lifted individuals (cf. footnote 6) it would be better to use intensional question properties, but I have not done so (partly) in the interests of presentational parsimony.

of (17c) contain these two questions. In fact, this allows us to isolate Q_{17} in the set (17c). Q_{17} is the *minimal member* of (17c), the unique member that is contained as a subset of all the other members of (17c).

An important part of the system we are developing is the presumption that the conceptual-intentional system, when faced with an utterance whose semantic value characterizes a set of questions, takes this to be a request to provide an answer for *each* question in the set. This is the basis for the analysis of pair-list readings of multiple-*wh*-questions, and indeed for conjoined questions as described above. This was treated in chapter 6 by hypothesizing Single Question Recognition and Multiple Question Recognition as part of the pragmatic system. However, the semantic type of (17c) is a set of *sets of* questions; this type is not covered by either Single Question Recognition or by Multiple Question Recognition. Accordingly, we must add Lifted Question Recognition, defined below.

(18) *Lifted Question Recognition*
If the semantic value of an utterance has type <<pt,t>,t> (a set of sets of questions) then the utterance will be treated as a (pair-list multiple) question.
To respond: For any one member set Q (a set of questions),
For each member set $A \in Q$,
(a) one proposition from the set A is selected,
or (b) the presupposition (that there is an answer in A) is denied.

What Lifted Question Recognition has us do when faced with a lifted question is this: We choose one member Q of the set of sets of questions, and address it (as a multiple question; i.e. we address all of the questions in the set Q). As to which single member we choose for Q, let us suppose the following. If we assume that any choice for Q is equally cooperative, then the choice for Q can be governed, essentially, by laziness.

(19) *Laziness*
When choosing among sets of questions for which any choice will be cooperative, choose the smallest set (where $X \subseteq Y \rightarrow X$ is smaller than Y).

Remembering that Q_{17} is a subset of every possible choice for Q out of the lifted question in (17c), Q_{17} will be the smallest member, and therefore the one chosen by Laziness. Put another way, since responding to Q_{17} would be cooperative, just as responding to any other Q that could have been chosen from (17c) would be cooperative, the choice of Q_{17} allows the respondent both to be cooperative and to minimize the exertion involved in being so.[8]

To finish off the example from (17), notice that we can write (17c) as follows:

(20) $\lambda Q \forall x \in \{\text{John, Mary}\}.Q(\lambda p \exists y.p=\text{love}'(x,y))$ <<pt,t>,t>

The function (20) characterizes the set of question-properties which are true for both the question *Who does John love?* and the question *Who does Mary love?*

[8] To connect this to existing literature on the semantics of questions (and of quantifiers), notice that the set which Laziness picks out is essentially the "minimal witness set" (cf. Cnierchia 1993, Barwise & Cooper 1981, Groenendijk & Stokhof 1984).

Here is where we are: We saw that in order to interpret conjoined questions, we need to lift them to a higher type, conjoining that higher type. In a matrix question, where that higher type turns out to be the type of the entire utterance, we see that it is treated (via the principle of Laziness) as being a (minimal) set of questions, each of which must be answered. We now want to apply what we have done to the main question of this section, namely the formalization of "quantifying into questions" in order to generate list answers to quantifier/*wh*-questions.

It should be intuitively evident that we can extend the conjunction of questions to the universal quantification over questions. Instead of ending up with a set of properties (of questions) that hold of two questions q_1 and q_2 (as we did in (20)) we want to end up with a set of properties that holds of all questions q_n. We can formalize this as in (21), where the q_n are represented as $q(x)$, a function from individuals to questions.

(21) $\lambda Q \forall x \in \text{WHO}.Q(q(x))$ <<pt,t>,t>

This is the set of question-properties which are true of all $q(x)$ derivable using an x from WHO. Following the logic before, the interpretive result (in light of Laziness) is that this is treated as a set of the questions $\wp$ which contains only the $q(x)$ for all $x \in$ WHO ($\wp$ is the smallest member of (21)). This is our goal. The next step is to see how this comes about compositionally.

The way this is going to work is that a QR-like operation will move *everyone* to adjoin to CP, causing λ-abstraction over the CP.[9] In the preceding discussion of conjoined questions, we saw reason to believe that we can raise the type of questions to a "lifted question," a set of question-properties (type <<pt,t>,t>). So, suppose that this type-lift occurs prior to the λ-abstraction caused by QR of *everyone*. The result after λ-abstraction and just prior to composing with *everyone* will have a type of <e,<<pt,t>,t>> (a function from individuals to lifted questions).[10]

Now, let us consider the meaning that *everyone* must have in the context of lifted questions. We have seen that in its basic form, *everyone* takes a predicate argument (type <ep>) and returns a proposition (type <p>) (recall (12)). What we want to define is a meaning for *everyone* that takes a unsaturated lifted question (type <e,<<pt,t>,t>>) and returns a lifted question. Such a definition is given in (22).[11]

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[9] Recall that this is how we treated pair-list readings *syntactically* as well, back in chapter 3.

[10] A point: This is a case in which flexible λ-abstraction must *not* apply, despite the fact that this appears to be an appropriate environment; if it did, the result would be something of type <<e,<pt,t>>,t>. It should be shown that were flexible λ-abstraction to apply, it would either yield something which could not be composed higher up or something that (even performing all of the necessary type-shifts) would turn out to be meaningless (e.g., returning the empty question, or something of the sort). This project is saved for later. If the project is successful, this probably means that in general flexible λ-abstraction is free to either apply or not (when presented with a set argument), but in certain (most? all?) cases the wrong choice is ruled out by later composition problems, tautologies, or contradictions.

[11] I would like to be able to motivate and define a family of *everyone*'s such that moving between its members is essentially like type-shifting. To be able to do this, I need to be able to define a common kernel of meaning for *everyone* and state the rule that can translate (12) into (22) (or, indeed, to other types). My initial attempts as formulating the meaning proved unsuccessful, so I will leave this as a task for a later time. Since we know what we want to end up with, I will for now be content simply to *define* the meanings for *everyone*.

(22) $[\![\text{everyone}]\!]_{<<pt,t>,t>} = \lambda \mathcal{Z}_e \lambda g \forall x \in \text{WHO}.\mathcal{Z}_e(x)(g)$ <<e,<<pt,t>,t>>,<<pt,t>,t>>

Let us walk through what (22) says. A lifted question is a set of properties of questions. According to (22), *everyone* takes as its argument an unsaturated lifted question, $\mathcal{Z}_e$, and yields a set of question properties g that meet the following requirement: g must be contained in *all* of the sets of question properties that arise by saturating $\mathcal{Z}_e$ with an argument x from WHO. To put this another way, *everyone* intersects the lifted questions that arise by saturating $\mathcal{Z}_e$ with an argument x from WHO. The result is a set of just those question properties that hold of *all* the lifted questions.

Recall that the actual problem at hand is how to compositionally arrive at (21), and so the next step is to show that (22) is sufficient for the task. Consider the point at which composition is to proceed between *everyone* and the function from individuals to lifted questions which arose via QR of *everyone* to CP. Suppose we were considering the question *What did everyone buy?* The sister to *everyone* would then be the function from individuals x to the (lifted) question *What did x buy?* This is illustrated in (23), where $\mathcal{Z}_e(x)$ takes on the value of the lifted question *What did x buy?* The result in (23) is the set of question properties g such that g holds of the question *What did x buy?* for all x in WHO.

(23) $[\![\textit{everyone}\ \lambda x\ [_{\text{lift}}\ \textit{What did x buy?}\ ]]\!] =$

$[\![\lambda x\ [_{\text{lift}}\ \textit{What did x buy?}\ ]]\!] \lambda \mathcal{Z}_e \lambda g \forall x \in \text{WHO}.\mathcal{Z}_e(x)(g) =$

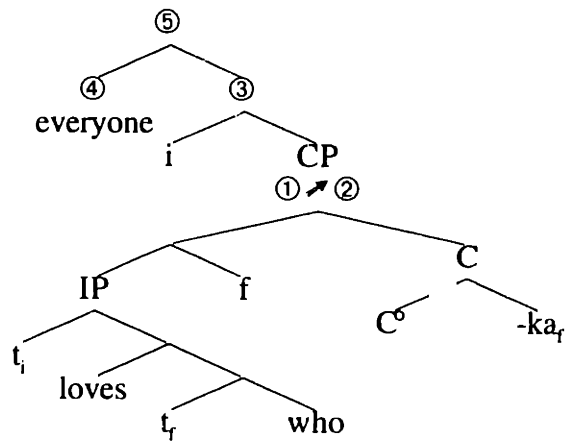
$\lambda g \forall x \in \text{WHO}.g\ \lambda Q.Q(\lambda p \exists y.p = \text{bought}'(x,y)) =$

$\lambda g \forall x \in \text{WHO}.g(\lambda p \exists y.p = \text{bought}'(x,y))$

A set of question properties (a lifted question) is a set of sets of questions. According to the principle of Laziness given in (19), this is interpreted by finding and addressing the smallest set of questions in the lifted question. The smallest set is the one which is contained in all of the others. What we end up with after (23) is the set of question-properties that are true of *all* questions of the form *What did x buy?* where x is drawn from WHO. We know that there is one question-property g which is true of *only* those questions and that all other question-properties contain g as a subset. By Laziness, it is g that will be interpreted, as the series of questions *What did x buy?* for all the x's in WHO. Happily, this is precisely the meaning we were after.

For completeness, a derivation in standard form is provided below, starting at the point where it differs from previous derivations.

(24)



①	λp∃x∈ WHO.p=[λw.loves′(i,x)(w)]	<pt>
②	λQ.Q(λp∃x∈ WHO.p=[λw.loves′(i,x)(w)])	<<pt,t>,t>
③	λiλQ.Q(λp∃x∈ WHO.p=[λw.loves′(i,x)(w)])	<e,<<pt,t>,t>>
④	λ$\mathcal{Z}_c$λg∀y∈ WHO.$\mathcal{Z}_c$(y)(g)	<<e,<<pt,t>,t>>,<<pt,t>,t>>
⑤	λg∀y∈ WHO.g(λp∃x∈ WHO.p=[λw.loves′(y,x)(w)])	<<pt,t>,t>

3. Loose ends

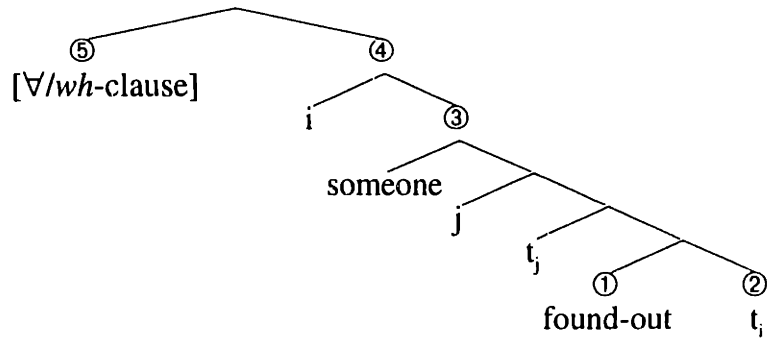
In the previous section, we worked out the details of how the pair-list reading of quantifier-*wh*-questions is derived, but we should go back to see how it applies to the data discussed in section 1. Recall that part of the evidence for analyzing the pair-list reading of quantifier-*wh*-questions as having a distinct type from other questions was the fact that an embedded *wh*-clause with a pair-list reading appears to be able to undergo QR and interact scopally with clausemate quantifiers.

To show how this works, we can essentially continue the example from the last section, and add a matrix clause with a subject quantifier. For example, we can consider the sentence in (25). The relevant reading of this sentence has the discover-er varying with the love-er.

(25) Someone found out who everyone loves.

We already derived the semantic value of the embedded question in (24); it has a type <<pt,t>,t>, which is a set of question-properties. This is not the right type to be the complement of *found out*. Rather, the complement of *found out* needs to be a question, type <pt>. Accordingly, QR is invoked, raising the embedded *wh*-clause to a point outside the proposition. The reading we are interested in is the one where QR carries the embedded clause to a point outside the scope of the matrix subject *someone*. As always, QR triggers λ-abstraction at its landing site, and the resulting structure comes out as below.

(26)



①	λpλxλw.found-out′(x,p)(w)	<pt,<ep>>
②	q	<pt>
③	λw∃f.found-out′(f(WHO), q)(w)	<p>
④	λqλw∃f.found-out′(f(WHO), q)(w)	<pt,p>
⑤	λ$\mathcal{P}$∀y∈ WHO.$\mathcal{P}$(λp∃x∈ WHO.p=λw.loves′(y,x)(w))	<<pt,t>,t>

At the final point in the derivation (26) there is a type-mismatch which needs to be resolved before composition can proceed. On the left, we have a pair-list quantifier-*wh*-question whose semantic value is of type <<pt,t>,t> as we know from the previous section. On the right, we have the matrix proposition, λ-abstracted over questions, making its overall type <pt,p> (a function from questions to propositions). Thus, the quantifier is looking for an argument of type <pt,t> but it is getting an argument of type <pt,p>.

The type mismatch that arises in (26) is not unique to this configuration; it also arises with the simple quantifiers like *everyone* if we treat them as having type <et,t>. That we have a type mismatch here is basically a notational side-effect of having been less than completely intensional in our earlier discussion. It is not a deep problem, but for the technical derivation to work out, it should at least be addressed.

Because we have already made use of type shifting rules (for example, the rule which allows lifting of questions and of individuals), we will treat this as another case requiring type shifting. The rule in (27) can serve this purpose.[12] By using (27), we can continue to talk in terms of extensional sets, rather than cluttering up the notation with extraneous world arguments.

(27) TYPE SHIFTING RULE
Where f is a function of type <τσ,σ>,
we can define a function f′ of type <<τ,ρσ>,ρσ> for any type ρ as follows:

f′ ≡ λhλx.f(λy.h(y)(x))

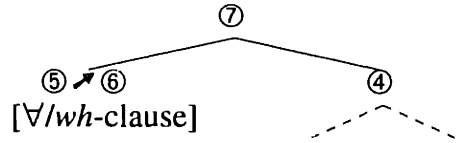
(where *h* is of type <τ,ρσ>, *x* is of type <ρ>, and *y* is of type <τ>)

The rule in (27) is exactly what we want, considering that we need the result to be a proposition. Recalling that propositions are of type <st>, we can use the type shifting rule above to shift the quantifier from type <<pt,t>,t> to type <<pt,st>,st> (in other words,

[12] The formulation of (27) was taken from Heim (1994), which in turn draws on Rooth & Partee (1982), Partee & Rooth (1983), and Rooth (1985).

(<pt,p>,p>) if ρ = s, τ = pt, and σ = t. With the help of (27), we can finish the derivation of (26) as follows:

(28)



④ λqλw∃f.found-out′(f(WHO), q)(w) <pt,p>

⑤ λ$\mathcal{Q}$∀y∈ WHO.$\mathcal{Q}$(λp∃x∈ WHO.p=λw′.loves′(y,x)(w′)) <<pt,t>,t>

⑥ λ$\mathcal{Z}$λw.⑤(λq.$\mathcal{Z}$(q)(w)) = <<pt,p>,p>
λ$\mathcal{Z}$λw∀y∈ WHO.[λp∃x∈ WHO.p=λw′.loves′(y,x)(w′)]λq.$\mathcal{Z}$(q)(w) =
λ$\mathcal{Z}$λw∀y∈ WHO.$\mathcal{Z}$([λp∃x∈ WHO.p=λw′.loves′(y,x)(w′)])(w)

⑦ [λqλw″∃f.found-out′(f(WHO), q)(w″)]
λ$\mathcal{Z}$λw∀y∈ WHO.$\mathcal{Z}$([λp∃x∈ WHO.p=λw′.loves′(y,x)(w′)])(w) =
λw∀y∈ WHO.([λp∃x∈ WHO.p=λw′.loves′(y,x)(w′)]
λqλw″∃f.found-out′(f(WHO), q)(w″)) (w) =
λw∀y∈ WHO. wλw″
∃f.found-out′(f(WHO), [λp∃x∈ WHO.p=λw′.loves′(y,x)(w′)])(w″)) =
λw∀y∈ WHO∃f.found-out′(
f(WHO), [λp∃x∈ WHO.p=λw′.loves′(y,x)(w′)]) (w) <p>

There are a lot of mechanical reductions involved in finishing up (28), but we end up with exactly the meaning we were after: for every person *y*, there is some person *z* (picked from WHO by *f*) such that *z* found out which person *x* is such that *y* loves *x*.

We have now succeeded in integrating the results of the previous section with the results of section 1. In section 2 we saw how the semantics of pair-list readings in *wh*-questions with quantifiers can be derived. We now turn to the second loose end I wish to cover in this section.

Only certain quantifiers allow pair-list readings, meaning that only certain quantifiers are allowed to "quantify into a question." Among the quantifiers that can do this is *everybody*, which is the quantifier that we used in the examples. Excluded from the quantifiers allowed to quantify into questions is *nobody* (as we know from the inability to get any pair-list-like reading for *What did nobody buy?*) There are two issues which we should address: (a) What characterizes the set of quantifiers that *can* quantify into questions? (b) What prevents other quantifiers from quantifying into questions?

Briefly, the problem with quantifiers like *nobody* or *almost everybody* is that Laziness is unable to pick out a unique minimal set of questions to use in Lifted Question Recognition. Essentially, this is conceptually the same explanation as appealing to the lack of a "unique minimal witness set" (see Groenendijk & Stokhof 1984).

Consider what happens if we were to quantify *almost everybody* into a question as in *What did almost everybody buy?* (intending a reading that the question in fact does not have). This yields a set of sets of questions, each one a set of questions containing, for almost everybody *x*, *What did x buy?* When we present this to Lifted Question Recognition, it instructs us to choose one of these sets of questions and address it as a multiple question. Which set of questions we choose is determined by Laziness, and it is here that the problem arises. Laziness tells us to choose the set of questions Q which is a subset of all of the other questions—but there is no such set. One set, Q_1, might exclude

the question *What did John buy?*, but have questions for everybody else (*everybody*, minus John, suffices as *almost everybody*), while another set, Q_2, might exclude the question *What did Mary buy?* but have questions for everybody else. This is true for every x in *everybody*; if we intersect all of these sets, we get the empty set. That is, there is no set which is contained in all of the sets formed by quantifying in *almost everybody*.

The idea, then, is that the quantifiers which are allowed to quantify in will be just those quantifiers for which Laziness can pick out a unique set of questions that is a subset of all the other sets of questions in the lifted question.

4. Chapter seven in review

This chapter proposed an analysis for the remaining major case of questions, namely questions with quantifiers that receive pair-list readings. The proposal that was advanced here is that such readings come about by "quantifying into questions," roughly parallel to the paraphrase of *What did everyone buy?* as *For everyone x, what did x buy?*

The first part of the chapter argued (following Moltmann & Szabolsci 1994 and Sharvit 1998 primarily) that a question with a quantifier that receives a pair-list reading itself acts as a quantifier. This can be explained if we suppose that the quantifier (after quantifier movement to a position outside the interrogative clause) phrase has scope over the entire interrogative clause, the details of which were covered in the preceding section.

In order to get the semantics right, we needed to introduce some new semantic concepts, but the concepts are needed for other reasons as well. This part of the argument primarily followed Groenendijk & Stokhof (1984). Specifically, we needed to introduce the semantic operation of "type lifting" (introduced at least as far back as Rooth & Partee 1982). By type-lifting the argument x of a function f, we reverse the function-argument relation between them, creating a higher-type function X which takes f as its argument. Type lifting is required in order for the semantics of coordination, including the coordination of questions, which provides the independent motivation for the operation and the semantic type.

A lifted question has a complex type (it is a set of sets of questions, type <<pt,t>,t>), but by lifting questions to this type, quantifying in of a quantifier like *everyone* can be accomplished straightforwardly.

In order to make use of lifted questions and to derive the observed interpretation they receive, we needed to add a third Recognition rule to our list of pragmatic rules (which from chapter 6 already included Single Question Recognition and Multiple Question Recognition). The third rule, Lifted Question Recognition, is repeated below.

(18) *Lifted Question Recognition*
If the semantic value of an utterance has type <<pt,t>,t> (a set of sets of questions) then the utterance will be treated as a (pair-list multiple) question.
To respond: For any one member set Q (a set of questions),
For each member set $A \in Q$,
(a) one proposition from the set A is selected,
or (b) the presupposition (that there is an answer in A) is denied.

Lifted Question Recognition is not quite enough by itself, however. What Lifted Question Recognition says is that when faced with an utterance whose semantic value is a lifted question, we choose one of the sets of questions it contains (recalling that a lifted question is a set of these sets of questions), and treat it as a pair-list multiple question (i.e. the same way Multiple Question Recognition treats sets of questions). What is left undetermined is *which* set of questions is chosen by Lifted Question Recognition. Under the assumption that any choice is in principle valid, the principle of Laziness, repeated below, makes the decision between them by finding the *smallest* set of questions in the lifted question and submitting *that* set to Lifted Question Recognition.

(19) *Laziness*
When choosing among sets of questions for which any choice will be cooperative, choose the smallest set (where $X \subseteq Y \rightarrow X$ is smaller than Y).

With all of these mechanisms in place, we then returned to work out the details of how to derive the quantifier-like properties of interrogative clauses receiving pair-list interpretations that we observed in the first section. The technical details are intricate, but they work out as long as we make use of one further type shifting rule (of the same kind as the type lifting rule used to turn questions into lifted questions). Because it was not a central part of the system being developed, it is not repeated here (but was stated in (27) in the previous section).

The accomplishment of this chapter was providing a detailed and technically coherent semantics for pair-list questions that not only explains the quantificational properties (discussed in the first and third sections) of interrogative clauses with quantifiers and pair-list readings, but also fits in with the syntactic analysis of chapter 3 which also showed evidence that quantifiers in these pair-list readings were moving to a position outside the interrogative clause. Many loose ends remain, but this nevertheless concludes the semantic proposal for the main cases of the semantics of interrogatives (single *wh*-questions, multiple *wh*-questions, functional readings of quantifier/*wh*-questions, and pair-list readings of quantifier/*wh*-questions).

Chapter 8 Closing arguments

> If you lived in the Dark Ages, and you were a catapult operator, I bet the most common question people would ask is, "Can't you make it shoot farther?" No. I'm sorry. That's as far as it shoots.
> —Jack Handey, *Deeper Thoughts*

In this chapter we will start out with some highly speculative approaches to some issues which were left open from chapter 4 concerning "Local Generation" and the Q-introduction Antisuperiority generation, as well as issues about where Q-migration is allowed. We will also touch on the semantic implications of Local Generation (in particular, the effect of Q-migration on interpretation). After that, we will finish with a more concise overview of the proposals made in the thesis as a whole, as a reminder of what we have seen.

1. Q-introduction Antisuperiority

In chapter 3, the "Q-introduction Antisuperiority" generalization was stated, and is repeated below in (1).

(1) Q-INTRODUCTION ANTISUPERIORITY GENERALIZATION
The base position of Q is as low in the tree as possible;
Q starts close to the lowest *wh*-word.

In chapter 4, we reviewed the case for Local Generation, under which view Q-introduction Antisuperiority should be restated as (2), where "close to" is replaced by "as a sister of":

(2) Q-INTRODUCTION ANTISUPERIORITY GENERALIZATION (REVISED)
The base position of Q is as low in the tree as possible;
Q starts as a sister of the lowest *wh*-word.

In chapter 3, (1) was worded in terms of being "close" to the lowest *wh*-word in order to allow us to abstract away from Q-migration and the Local/Remote Generation issue covered in chapter 4. In this section, I would like to make a suggestion as to why (2) holds, based in part on the semantics we have developed in the previous three chapters.

We can understand the generalization in (2) in a reasonably natural way, if we suppose that the mechanism of flexible functional application (introduced in chapter 5) is *costly* and therefore avoided where possible. This is stated below in (3).

(3) AVOID FLEXIBLE FUNCTIONAL APPLICATION
Merge Q immediately after merging a *wh*-word.

It is clear how merging Q can avoid the need for flexible functional application. The *wh*-word has a semantic value which is a set of individuals. If a predicate takes the *wh*-word directly as an argument, the result will require flexible functional application and will result in a *set* of representations. However, if Q is merged immediately after the *wh*-word,

it introduces a choice function (variable), which will choose a single member of the set introduced by the *wh*-word. If a predicate takes this complex as its argument, the result is just a single representation. Thus, by merging Q immediately, flexible functional application can be avoided, resulting in just *one* representation. We can see that a derivation that requires flexible functional application is plausibly more costly than one that does not.

Presuming that the derivation cannot "look ahead" to see what will be merged into the structure later, we expect that in a bottom-to-top derivation, the first *wh*-word to be introduced (that is, the hierarchically lowest one) should be the one by which Q is base-generated. That is, we have a principled reason to expect that (2) would hold.

If this is the right interpretation of (2), it may also give us a handle on a class of cases where Q-migration appears to occur even in cases that do not involve islands. We turn to discuss these next.

2. Q-migration in single-pair questions, FNACC in functional questions

In addition to the cases where Q-migration occurs to move Q out of islands, there are two other situations where the launching site of Q appears to be remote from the *wh*-word. The first is the case of a multiple *wh*-question with a single-pair reading. The second is the "functional" reading in *wh*-questions with a universal quantifier. The semantic representation of each of these cases was already discussed in chapter 6.

In multiple *wh*-questions, we discovered in chapter 3 that the pair-list reading arises from a structure in which Q launches from below one of the *wh*-words. This was the "Pair-list Antisuperiority" generalization, repeated below in (4).

(4) PAIR-LIST ANTISUPERIORITY GENERALIZATION
A multiple-*wh*-question gets a pair-list reading when
not all *wh*-words are in the scope of Q

We derived (4) in chapter 6 with the help of flexible functional application; with at least one *wh*-word outside the scope of the choice function, flexible functional application yields a representation which is a set of questions. This, it was proposed, is the representation which is interpreted as a pair-list question.

However, these questions can also receive a "single-pair" reading, which is *not* derived from this kind of structure. Rather, the single-pair reading (as was already suggested in chapter 6) arises from a structure in which the launching site of Q is outside both *wh*-words. As support for this, recall that in chapter 3 it was noted that when two *wh*-words are contained inside an island, no pair-list reading is available between them. That is, when Q launches from outside both *wh*-words, a single-pair reading results.

Considering the Q-introduction Antisuperiority generalization discussed in the previous section, we must suppose even in these cases that Q is base generated by the lowest *wh*-word in the structure. This means that if the launching site of Q is outside both *wh*-words (as we suppose that it is on a single pair reading), this must be as a result of Q-migration to that launching site. There is a potentially sensible way to look at the occurrence of Q-migration in these cases, however.

Consider the following: In a multiple *wh*-question, the lowest *wh*-word enters the derivation (which is proceeding bottom-to-top) first, and by the Q-introduction

Antisuperiority generalization, Q is merged immediately afterwards. The derivation proceeds, and then another *wh*-word is placed into the structure. At this point, there is a choice, and the result of this choice determines which of the two readings the multiple question will get.

The choice is between migrating Q to the root or not. Notice that because another *wh*-word was introduced, failure to migrate Q will result in the need to use flexible functional application. If Q is migrated (that is, if Q winds up with both *wh*-words in its scope), the question will receive a single-pair reading. On the other hand, if Q is not migrated, it launches from its internal position, below the higher *wh*-word; this is the canonical situation in which the pair-list reading arises (in accordance to the Pair-list Antisuperiority generalization).

There are two things to notice about this choice of whether or not to migrate Q. First, neither decision *eliminates* the need for flexible functional application in the interpretation of the structure. If Q migrates, flexible functional application is needed to interpret the lower *wh*-word in its context; if Q does *not* migrate, flexible functional application is needed to interpret the higher *wh*-word in its context. Second, the two structures lead to distinguishable readings (pair-list vs. single-pair); if the derivation proceeds with some form of target interpretation (or at least a target *type*), Q-migration might not even be optional (cf. Fox 1995).

For this account to work, of course, it requires that Q-migration can happen *not only* at the edge of islands, but *also* when a *wh*-word is merged. We can state this at its most descriptive as (5).[1]

(5) Q-MIGRATION
At a point where (a) an island is constructed, or (b) a *wh*-word is merged,
Q may migrate to adjoin (overtly) to the root.

(5) is intended as a statement about the derivation. The derivation proceeds from bottom-to-top (as discussed in Chomsky 1995), and at the point where an island is completed (for example, an adverbial clause), the option of Q-migration becomes available. The only place Q can migrate *to* is the current root of the derivation, e.g., adjoining outside the just-constructed island. Of course, if Q fails to take this option (in a question, after an island is constructed), the derivation will crash because later Q will be attracted and will be unable to move out of the island. As for the fact that migration must be *overt*, this is accounted for by simply *defining* Q-migration as an overt operation.

As alluded to before, there is a second case in which the launching site of Q appears to be remote from the *wh*-word, namely the functional interpretation of a *wh*-question with a universal quantifier. The semantics of these questions was discussed in detail at the end of chapter 6, where it was proposed that the "functional" interpretation arises from a "functional accessibility" operator we labeled FNACC. This operator has no overt

[1] David Pesetsky (p.c.) suggests that the disjunction in (5) might be overcome if we could suppose that islands involve null operator movement. He notes that the ambiguity of *after*-clauses in English might suggest such an analysis (for English). That is, *after John said Mary had left* can indicate either a time after the saying or (somewhat less accessibly) after the leaving. Assuming null operators are essentially silent *wh*-phrases, (5) could then be reduced to (5b). I note this here, but I do not explore this possibility further in this thesis.

phonological realization, but serves to introduce a bindable variable, much in the same way as Chierchia's (1993) "functional trace" does.

The idea is that FNACC takes a *wh*-word as its complement and has a semantic value that is determined relative to the value of a bound pronoun. Let me offer the following (highly speculative) account of why Q is remote from the *wh*-word in functional questions of this type, already hinted at in chapter 6.

Recall that the conclusion from section 1 was that Q is introduced after the lowest *wh*-word (the Q-introduction Antisuperiority generalization) in order to alleviate the need for flexible functional application (which is costly, by (3)). The proposal I make now is that FNACC, like the launching site of Q, is *also* able to forestall flexible functional application, but in a slightly different way. The way that merging Q avoids the need for flexible functional application is by introducing a choice function variable, which reduces the set of representations (introduced by the *wh*-word) to a single representation (chosen by the choice function). In the absence of Q, the *wh*-word would trigger flexible functional application, which would compute and hold a representation for each member of the set introduced by the *wh*-word. FNACC relativizes a set of representations to the value of a to-be-bound pronoun. How might flexible functional application proceed when the members of the set over which it is to operate are relativized to this yet-to-be-bound pronoun? Let us suppose that it in fact *cannot*; flexible functional application cannot evaluate the structure until the quantifier enters the structure, that is, until the pronoun is bound. If we suppose that flexible functional application simply cannot operate until this pronoun is bound, the pressure to merge Q will be relieved. Thus, after merging a *wh*-word into the structure, flexible functional application can be avoided *either* by merging Q *or* by merging FNACC.

Under this hypothesis, the derivation of a *wh*-question with a universal quantifier can proceed as follows: First, FNACC is merged immediately after the lowest *wh*-word. After this point, the derivation proceeds but is unable to call upon flexible functional application until the binding quantifier is merged. Once this quantifier is merged into the structure, flexible functional application can once again operate, and the costliness of flexible functional application motivates the immediate merger of Q.

The syntactic proposal that this leads to is that in functional questions of this sort, the *base position* of Q is remote from the *wh*-word. To put it another way, due to the availability of FNACC, in this one case we have a Remote Generation explanation (cf. chapter 4). This is allowed because FNACC and Q are *each* able to avoid unnecessarily application of flexible functional application, although in different ways.

A last point about (5): Although (5) mentions Q explicitly, it is not only Q that can migrate. We know that other particles can migrate, including at least focus particles like Sinhala *tamay* and like the focusing *kakari*-particles in Premodern Japanese and in Okinawan. An important question to ask is: What characterizes the class of elements that can migrate in this way? How restricted is this class of elements? We can get some ideas of how to answer this question by looking at aspects of the interpretation of structures under the Local Generation account, which we turn to now.

3. The semantic interpretation of Local Generation

We have seen in several of the past few chapters that the launching site of Q has a special semantic significance; specifically, it introduces the choice function variable. We have seen effects of the launching site on interpretation with respect to the Pair-list Antisuperiority generalization (recall (4)), which says that a multiple-*wh*-question receives a pair-list reading if at least one of the *wh*-words is outside the scope of the launching site of Q. One place that this had an effect was in the context of islands; when Q is launched from outside an island, the values for *wh*-words contained within the island must both be specified (in the answer) at the same time. That is to say, no pair list reading is possible between *wh*-words inside an island. An example of this is repeated below (from chapter 3) in (6). (6) has two *wh*-words, both inside an adjunct island, and no pair-list reading is available.

(6) Taroo-ga [dare-ga nani-o katta toki-ni] okotta no?
Taroo-NOM who-NOM what-ACC bought when got.angry Q
'Taroo got angry when who bought what?' (*PL, SP)
(Shigeru Miyagawa, Takako Aikawa, p.c.)

Of interest to us here is the fact that the semantic significance is attached to the *launching site* of Q and not the *base position* of Q. This is particularly evident in the island case just mentioned. Assuming Local Generation, we know that Q originates inside the island, yet this is not enough to provide the pair-list reading. It is crucial that the Pair-list Antisuperiority generalization refer to *launching site* and not to the *base position* of Q.

We can state this idea in its strongest form as follows.

(7) SEMANTIC INTERPRETATION OF Q-MIGRATION
The base position of Q-migration has no semantic interpretation.

What (7) says is that the semantic interpretation proceeds as if Q was never in its (island-internal) base position. Syntactically, we know it was there (recall the discussion from chapter 4), but semantically Q only has any force at its post-migration (island-external) position. This was actually what was assumed in chapters 5–7. However, it is a very strong condition; few things would be able to be simply relocated in the semantic representation without causing that representation to become uninterpretable.

In fact, this property of (7) might give us an angle from which to approach the question which ended the previous section: perhaps the class of elements which are eligible to undergo "migration" are just those elements for which migration will not result in an uninterpretable semantic representation. Of course, at this point, this is only speculation.

The generalization in (7) might also help us account for the distribution of *ittai* in Japanese. Even without a concrete proposal for the semantics of *ittai*, it is plausible to assume that it modifies the launching site of *-ka*. More specifically, suppose that *ittai* is only semantically interpretable when modifying the choice function variable corresponding to the launching site of *-ka*. This means that as the structure is constructed, *ittai* must be base-generated next to *-ka*. From this point, it can scramble in the same way numeral quantifiers can scramble, so long as the tail of this scrambling chain remains adjacent to the launching site of *-ka* (as discussed in chapter 2).

Now, notice that if *ittai* is base-generated inside an island (next to *-ka*), *-ka* will migrate out of the island leaving *ittai* behind. But according to (7), the place from which *-ka* migrated will not have any semantic representation; the choice function variable is now interpreted higher in the structure, at the launching site of *-ka*. This means that *ittai*, left inside the island, is no longer modifying the choice function variable. Since *ittai* has no interpretation except as a modifier of the launching site of *-ka*, this representation will be simply ill-formed. Hence, *ittai* is prohibited inside of islands.[2]

We were reminded in chapter 4 that *ittai* appears to be able to be generated in any clause along the way between the base position of *-ka* and its final landing site. This was taken as evidence that *-ka* moves successive-cyclically, providing a "launching site" by which *ittai* can be generated. Notice that for this account to hang together with the proposal just made, it must be that intermediate launching sites form part of the interpretation chain; the intermediate launching sites of Q serve as "repeaters," allowing Q in its final landing site to bind its initial trace indirectly, by binding an intermediate trace (in the intermediate launching site) which in turn binds the original trace (cf. Cresti 1995, who provides a brief discussion of essentially this idea).

This raises a technical question about the cases that forced us to a Local Generation view in chapter 4, where we saw successive-cyclic Q-movement even inside an island. Just as a point of fact, we find that *ittai* is not allowed inside these islands either, as shown in (8).[3]

(8) ??(?) Taroo-wa [Hanako-ga [John-ga **ittai** nani-o sita to]
Taroo-TOP Hanako-NOM John-NOM **ittai** what-ACC did that
itta ato de] kaetta no?
said after went.home Q
('Taro went home after Hanako said that John did what (in the world)?')
(Shigeru Miyagawa, p.c.)

The ill-formedness of (8) tells us that the intermediate launching site by which *ittai* appears in (8) is not *interpreted* (semantically) as part of the chain that reaches the landing site of *-ka* in the matrix clause periphery. That is, it appears that Q-migration breaks any connection between the launching site Q and lower intermediate launching sites. This seems reasonable; according to (7), Q-migration is essentially a (semantically) trace-less movement.[4]

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[2] An alternative way to derive this would be to suppose that *ittai* and *-ka* can migrate *together* to the edge of the island. I do not know of anything that would differentiate these two views.

[3] (8) may be better than other cases of *ittai* in islands, although Shigeru Miyagawa (p.c.) suggests that this might be just an effect of the length of these examples. However, (8) is certainly worse than the corresponding example without *ittai*. Some other people I asked about this examples found it not too bad. If it turns out that (8) is well-formed but just awkward, we can avoid the issue mentioned in the next footnote. The implication would be that if the head of a movement chain is migrated away, the chain remains a chain, only its head has ended up in a place it could not have *moved* to, only *migrated* to. Put another way, migration "stretches out" the chain. This might in fact be a more elegant story, although the data deciding between this and the opposite conclusion reached in the text below is still not well-established. Note that even if this were true (that is, even if (8) is "good"), it still predicts that *ittai* is not allowed inside simplex islands, only inside embedded clauses (even if in an island).

[4] There is an aspect that remains unexplained for these cases with a *wh*-word inside an embedded clause, inside an island. Given that *-ka* moves successive-cyclically, it is attracted to the embedded complementizer,

(...continues) ➡

4. What we have done: A syntax and semantics for questions

In this section, the various proposals that have been made throughout the thesis are collected. Throughout this section, I will mark the chapters and sections in which the relevant subjects were discussed using a shorthand notation, where "(1§2)" refers to chapter 1, section 2.

The basic proposal is that in *wh*-questions (at least in *wh*-in-situ languages like Japanese, Premodern Japanese, Sinhala, and Okinawan), there is a morpheme Q which is base-generated as a sister to a *wh*-word and moves to the clause periphery. This Q morpheme contributes an existential quantification (over choice functions) to the semantics, a crucial component of the semantics of questions. The movement of Q is accomplished by feature attraction.

Some of the evidence for this view came from a comparison of questions in Sinhala and Japanese. While both are *wh*-in-situ languages, Q in Sinhala generally surfaces clause-internally, whereas Q in Japanese generally surfaces at the clause periphery. We interpreted this as a difference in the "timing" of Q-movement; in Sinhala, Q moves *covertly* to the clause periphery, while in Japanese, Q moves *overtly* to the clause periphery. These two languages allowed us a sort of "before" and "after" picture of the syntactic derivation with respect to Q.

The evidence for Q movement in Sinhala came mainly from three different places. First, there appear to be cases where Q has overtly moved to the clause periphery already (1§3). For example, questions involving amount *wh*-words like *kiidenek* 'how many (animate)' or *koccərə* 'how much' can have Q either clause-internally or clause-peripherally. This is also true of yes-no questions. A question embedded under *dannəwa* 'know' also has the option of having Q either clause-internally or clause-peripherally. In each case, the verbal suffix 'E' surfaces only when Q is clause-internal. The proposal (2§2) was that the 'E' reflects an "unchecked feature" which is motivating the movement of Q; that is to say, Q moves in order to delete the feature on the verb reflected morphologically by 'E'.

The second piece of evidence for Q movement in Sinhala comes from the observation that Q is not allowed inside movement islands, such as Complex Noun Phrase islands or adjunct islands (2§1). It is possible in Sinhala to have a *wh*-word inside an island, but only when Q surfaces just outside the island. Under the standard assumption that islands block movement, we can understand this as evidence that Q must move from its overt position in Sinhala to the clause periphery. Because Q appears clause-internally (under most circumstances), this movement is covert movement.

(continued...)

which presumably creates a chain that should be visible to the semantic interpretation. However, the head of that chain is then migrated away, to the launching site outside the island. Since the position prior to migration has no semantic interpretation (indeed, the point of (8) was to show that the semantic chain does not extend into the island), this leaves the first chain between the base position of *-ka* and the embedded complementizer with an unclear status. It is presumably interpreted as essentially vacuous, although whether this is a problem under "Full Interpretation" is not clear. Cf. the discussion in the previous footnote.

The third piece of evidence for Q movement in Sinhala comes from the analogy with Japanese (2§3). The Q particle in Japanese questions invariably surfaces clause-peripherally. Apart from this, the structures of Japanese and Sinhala are remarkably similar. As support for identifying the Q particle (*-ka*) in Japanese with the Q particle (*də*) in Sinhala, we observed that in both languages this same particle can both form indefinites when attached to *wh*-words (*dare ka* 'who Q = someone' (J), *kau də* 'who Q = someone' (S)), and form disjunctions (*John ka Bill (ka)* 'John or Bill' (J), *tee də koopi də* 'tea or coffee (alternative question)' (S)). That is, Q in each language seems to perform the same function. Yet, in Japanese *wh*-questions, this morpheme is clause-peripheral, while in Sinhala *wh*-questions, this morpheme is (generally) clause-internal. The proposal was that Q in Japanese moves *overtly* to the clause periphery, on the same path as the proposed covert movement of Sinhala Q. Thus, this constitutes evidence for movement in Sinhala through a crosslinguistic parallel in which the movement is overt.

We also reviewed a great deal of Japanese-internal evidence for the hypothesis that Q moves in questions from a clause-internal position. We found that *ittai* '...(in the world)' (as in *ittai nani* 'what in the world') could constrain the "launching site" of Q (that is, the position which corresponds to the overt position of Q in Sinhala). In particular, placing *ittai* inside an island yields ungrammaticality in a *wh*-question, while *ittai* outside an island is fine (2§4). By making use of *ittai*, we were able to replicate the facts from Sinhala. Where the launching site of Q is inside an island, the question is ungrammatical. However, where the launching site of Q is situated just outside an island, the question is fine.

A second important piece of Japanese-internal evidence for Q-movement came from "intervention effects." It appears that there is a class of "intervenors" across which the movement of Q from the launching site to the clause periphery cannot proceed (2§6). These intervenors seem to either contain Q as a subpart (e.g., *dare<u>ka</u>* 'someone', *John-<u>ka</u> Bill* 'John or Bill') or contain another particle which is arguably of the same category as Q (*-mo*, as in *dare<u>mo</u>* 'everyone/anyone'). This supports the view that movement is carrying Q to the clause periphery, especially under the view that movement is driven by attraction of features; since an instance of Q contained in an intervenor has all the same features as the Q which needs to move to the clause periphery, it cannot be between the attractor and Q at the point in the derivation where feature attraction occurs.

This view predicts that intervenors inside an island will not be on the path of Q-movement, since the launching site of Q (i.e., where Q appears in the context of islands in Sinhala) is outside the island. We saw that this prediction was met (2§6).

We see, given all of the above, that we have good evidence for movement between this "launching site" of Q (generally the position of Sinhala *də*) and the clause peripheral position of Q (the position of Japanese *-ka*). However, we need to distinguish the *launching site* of Q from the *base position* of Q because there are cases where we know that Q actually *moves* to the launching site (4§1). The evidence for this came from questions in Japanese in which a *wh*-word is in an embedded clause *inside* an island. We found that, although intervention effects disappear inside simple islands (2§6), they return inside embedded clauses inside islands. Because the intervention effect is caused by Q-movement over an intervenor, we can only conclude that Q was at some point inside the island.

The evidence forces us to is a "Local Generation" view, in which Q is base generated next to a *wh*-word (and therefore inside any island containing the *wh*-word). Earlier in this chapter (8§1), we saw a semantic/economy reason for this base positioning of Q. The evidence showing effects of Q inside an island also forces us to posit the operation of "Q-migration" (4§1) which can move Q to the edge of islands. Q-migration (as we see it in Sinhala) must be overt, does not operate using feature attraction (hence causes no intervention effects), and leaves no semantic trace of its having applied (8§3, cf. footnote 3, this chapter). Finally, this evidence of intervention effects inside declarative clauses embedded inside islands tells us that even *declarative* complementizers attract Q, since intervention effects are a side effect of Q-movement by feature attraction. Put another way, Q must move successive-cyclically to its final destination at the periphery of an interrogative clause, being attracted to each intermediate complementizer.

Apart from the syntactic evidence for Q-movement, we looked at the semantics of questions and found that by positing a set of individuals as the semantic value for *wh*-words and existential quantification over choice functions as the semantic value of Q, we can straightforwardly derive appropriate semantic representations both for questions (5§4) and for indefinites formed of a *wh*-word and Q (e.g., *dare-ka* 'someone' (J)) (5§3). We adopt a standard approach to semantics of questions in which the semantic value of a question is the set of propositions that serve as its possible answers (5§1).

Turning to questions with multiple *wh*-words, a new set of problems confronted us. First, there is a question of where the single Q is base-generated in a question with more than one *wh*-word; under Local Generation, we know that Q originates by one *wh*-word or the other, but the question is by which (and on what basis is the choice made)?

We started by trying to determine the *launching site* of Q. The conclusion we reached is that the launching site of Q affects the reading that a multiple-*wh*-question will get, as summarized below. This was referred to as the Pair-list Antisuperiority generalization (3§3), which said that in order to get a pair-list reading for a multiple-*wh*-question, one of the *wh*-words had to be outside the scope of the launching site of Q.

(9)

Q ... t_Q [... *wh*-word$_1$ ... *wh*-word$_2$ ...]	**single pair reading**	
Q ... [... *wh*-word$_1$ ... t_Q *wh*-word$_2$ ...]	**pair-list reading** (exhausts *wh*-word$_1$)	

Later, we derived this generalization from the semantics of the pair-list reading of multiple questions (6§1); a pair-list reading is represented as a *set* of questions, and the only way to get a set of questions with a single Q and two *wh*-words is to allow one of them to trigger flexible functional application. This also derives the apparent "universal force" of the higher *wh*-word, since the representation of the pair-list question is a set of questions, one for each member of the set introduced by the higher *wh*-word.

The single pair reading that arises when Q is launched from outside both *wh*-words is expected because flexible functional application is required to evaluating the semantic representation up until Q is introduced (6§1).

The fact that two *wh*-words in an island are forced to get a single-pair reading (3§2, 6§1) implies, under the Local Generation view that we have adopted, that only the *launching site* of Q (and not the *base position* of Q) is semantically active (8§3). To put it another way, we find the choice function variable only in the position from which Q makes its final movement, attracted to the clause periphery.

Returning to the question of the *base position* of Q, we found that in multiple questions, Q appears to be introduced as soon as possible; derivationally (in a bottom-to-top derivation), this means that it is introduced by the structurally lowest of the *wh*-words. This was called the Q-introduction Antisuperiority generalization (3§3), for which we saw an semantic/economy motivation (8§1). Some of the evidence for the Q-introduction Antisuperiority generalization was sketchy, and based on volatile judgments, but nevertheless appeared to tend in the stated direction. In Sinhala and Okinawan, the most unmarked position appeared to be on the lowest *wh*-word (3§1). Looking at the interaction of scrambling with available readings in Japanese multiple-*wh*-questions and at the interaction of scrambling with Q-placement in Sinhala multiple-*wh*-questions provided support for the Q-introduction Antisuperiority generalization (3§3).

At the end of chapter 6, we looked at the phenomenon of "long-distance lists" (6§4) and found that, in fact, given the semantics that we had already developed, questions in a "*wh*-triangle" configuration (a single *wh*-question in the matrix clause with a multiple *wh*-question embedded within it) are expected to have a reading which pairs a *wh*-word from the lower clause with the *wh*-word from the matrix clause. Specifically, the *wh*-word which is exhausted in the lower clause (outside of the scope of the launching site of the embedded Q), can trigger flexible functional application at the clause boundary, resulting in a pair-list multiple question which exhausts the embedded *wh*-word.

Questions with quantifiers can have two readings apart from a single-answer reading, specifically the functional reading and the pair-list reading. In Japanese, the questions *daremo-ga dare-o aisiteiru no?* 'Who does everyone love?' seems only to have a functional reading (6§3). In this question, if Q were launched from next to the *wh*-word, it would have to cross the intervenor *daremo-ga* 'everyone' on its way to the clause-periphery. Because the functional reading is possible, we concluded that for this reading Q need not cross *daremo-ga* in the subject position. It was proposed that in these cases, Q launches from higher in the structure, after *daremo-ga* has been introduced. The functional reading itself arises from the use of a "functional accessibility" operator FnAcc, which relativizes the set introduced by the *wh*-word to the value taken on by a bound pronoun. By interpreting Q-introduction Antisuperiority as an avoidance of flexible functional application (8§1), we can predict this behavior on the assumption that introducing FnAcc renders flexible functional application ineffective until the binder (*daremo-ga*) is introduced (8§2).

The other reading that questions with quantifiers can get is a "pair-list" reading, which is the most complicated case we examined in this thesis. The proposal is that this reading arises when a quantifier (generally a universal quantifier) moves to a position outside the interrogative clause and "quantifies in", turning a question like *What did everyone buy?* into something like *For everyone x, what did x buy?* Evidence for this came in part from German (3§5) and was seen to be consistent with the facts in Chinese as well (3§7). We also saw evidence that interrogative clauses with pair-list readings (in English) act as if they are themselves quantificational (7§1). We worked out a semantics for

quantifying into questions that involves "lifting" questions to a higher semantic type (turning them into generalized quantifiers over questions) (7§2).

5. Notes about the bigger picture

We have investigated the syntactic and semantic structure of (a small number of) *wh*-in-situ languages, and shown that we can understand both the syntax and the semantics in terms of a movement of Q from a clause-internal position to the periphery of an interrogative clause. Notice in particular that nothing has required the additional movement of the *wh*-words themselves; the semantics comes out just as we need it to, even leaving the *wh*-words in place. The syntax would only be complicated by supposing that movement of the *wh*-words must also occur (e.g., out of islands, without any observable effects).

In general, this tells us that *wh*-movement is not *required* to derive the semantics of questions. To put it another way, the *wh*-movement that we observe in other languages (like English) is not driven by the semantic requirements.

I point this out in order to indicate that whatever *wh*-movement is in English, the account of it will be something over and above the story given here. That is not to say, of course, that none of the results from this thesis are applicable to English; in fact, I have been operating under the assumption that this "Q-morpheme" and the movement thereof will have implications crosslinguistically, only perhaps at a more subtle level in some languages than in Japanese and Sinhala. My own suspicion (and a suspicion shared by others, some explicitly in print) is that the proper treatment of *wh*-movement in English will categorize it as some kind of focus movement.

When we turn to look at other languages in light of the proposals in this thesis, there are certain things we now know to look for. We should look at the behavior of *wh*-words in islands, since these—if grammatical—will be cases where Q (whatever its realization in the language) must be launching from outside the island. We also want to look for things which intervene on the path of Q-movement; indefinites, universals, and disjunctions are a likely place to find such things. We have not really addressed the question of how the semantics of Q fits into most of the intervenors we have seen in Japanese (e.g., what is *-ka*'s role in disjunction, in terms of existential quantification over choice functions?); can we get clues from parallel items from other languages? We want to ask about readings (particularly pair-list vs. single-pair readings) of multiple-*wh*-questions, and see if they are consistent with other diagnostics for the launching site of Q.

There are many things to do, many questions still unanswered, many data points still with uncertain status. Nevertheless, the overall picture looks promising as the beginnings of a proper characterization of the pieces of questions.

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