Scope Marking: Cross-Linguistic Variation In Indirect Dependency

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1. Overview

A scope marking structure is characterized by the fact that it has two clauses, each of which contains wh-expressions [CP1 ... wh1 ...] [CP2 ... wh2 ( ...whn) ...]. While wh1 is a fixed lexical item, wh2 ... whn are not. A possible answer to the question seems to specify values not for wh1 but for wh2 ... whn. In recent years, such structures have come under a lot of scrutiny and various analyses have been proposed to account for their properties. In spite of differences in detail, these analyses can be classified into two groups on the basis of the status they accord to the wh-expressions. The direct dependency approach treats wh1 as semantically inert and assigns matrix scope to why...whl. The indirect dependency approach, on the other hand, takes wh1 to play a crucial role in determining what the question quantifies over. Wh2 ... whn do not have matrix scope but play an indirect role in matrix quantification because CP2 forms the restriction of wh1. Seen in this light, the direct and indirect dependency approaches are not tied to particular syntactic claims about the relation between CP1 and CP2. Whether a particular analysis can be characterized as direct or indirect depends solely on the status of the wh-expressions at transparent LF, von Stechow’s term for the level of syntactic representation that feeds into the interpretive module.

This paper is primarily concerned with cross-linguistic variation in scope marking structures. In particular, it investigates whether languages differ in instantiating a direct or an indirect dependency. It argues that different syntactic options exist in natural language for scope marking structures but the semantic relation remains constant. Wh1 always fixes what the question quantifies over while the restriction on the quantification depends on wh2 ... whn. That is to
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2.1. The Direct Dependency Approach
The second section of the paper focuses on similarities and differences in scope
marking structures across languages. Integrating a recent proposal relating scope
marking structures to paratactic constructions, three different syntactic realizations
for scope marking are shown to be logically possible in natural language.
Evidence is presented to establish that this is the locus of cross-linguistic vari-
tion in German, Hindi, and English. As far as the semantics is concerned, scope
marking in all these languages instantiates an indirect dependency. The third
section addresses what may be considered open questions in the literature and
future research on the topic.

2. Direct vs. Indirect Dependency
2.1. The Direct Dependency Approach
Scope marking has traditionally been analyzed in relation to the better-known
extraction structure. Van Riemsdijk (1982) noted that German extraction and
scope marking structures have the same possible answers. (1-a) and (1-b), for
example, both allow answers naming individuals who, in the addressee's opinion,
Mary has spoken to. That is, (1-c) could be used to answer either question:

(1) a. Mit wem glaubt Karl dass Maria gesprochen hat?
    with whom thinks K. that M. spoken has
b. Was glaubt Karl mit wem Maria gesprochen hat?
    what thinks K. with whom M. spoken has
   'Who does Karl think Maria has spoken to?'
c. Karl glaubt dass M. mit Hans gesprochen hat.
    K. thinks that M. with H. spoken has
   'Karl thinks Maria has spoken to Hans.'

It is standard practice to analyze questions in terms of the answers they allow.
It is assumed, in particular, that answers to questions specify values for all and
only the *wh*-expressions that have matrix scope. The possible answers to (1-a) and
(1-b) suggest, then, that they both have a representation like (2) at transparent
LF:

(2) [C1 $\lambda$p [IP Karl think [CP2 Maria to $t_1$ has spoken]]]

Assuming that LF is the syntactic level of representation that is the input to
interpretation and adopting a semantics for questions such as Harnblin (1973),
we get (3-a) as the semantic translation of (2). That is, (2) denotes a set of
propositions, each one of which constitutes a possible answer to the question. In
a particular case, (2) would yield sets such as (3-b):

(3) a. $\lambda$p $\exists$x [person'(x) & p = "think"'(k,spk-to'(m.x))]
b. {Karl thinks Maria has spoken to Peter, Karl thinks Maria has spoken
to Hans ...}

In this way of interpreting questions, *wh*-expressions are existential quantifiers
whose restriction is either implicit or provided by the common noun inside the
*wh*-expression. The *wh*-expression crucially determines the set of entities that
can be specified by the answer. The fact that (1-a) and (1-b) allow the same
answers thus follows straightforwardly under an approach that assigns (2) as the
LF representation for them.

Deriving (2) as the LF for (1-a) is trivial, since the dependency between
matrix Spec and embedded argument position is established at S-structure. The
connection between (1-b) and (2) is harder to establish. Here the embedded *wh*
has to be given matrix scope while the matrix *wh* must be treated as semantically
vacuous. The challenge posed by scope marking structures, then, is to establish a
dependency between the matrix Spec position and the argument position where
the embedded *wh*-expression originates.

McDaniel (1989), building on van Riemsdijk's suggestions, claims that the
scope marker, was in the case of German, is an expletive base generated in Spec of
the matrix CP. Lacking semantic content, it forms a chain with the *wh*-expression
which is in the Spec of the embedded CP, and is in turn linked to the orginal
argument position via movement. The representations of (1-a)-(1-b), under her
analysis, are as in (4):

(4) a. CP-1
   Spec
   | C
   C1
   C0
   IP
   V
   VP
   Karl
   DP
   thinks
   with whom
   that
   Maria
   PP
   gesprochen hat
   has

   CP-2
   Spec
   $t_2$
   C
   C0
   IP
   V
   VP
   Karl
   DP
   daft
   that
   Maria
   $t_1$
   gesprochen hat
   has

   \[c1 \\lambda p [ip \ kl \ think [c2 \ ma \ to \ t1 \ has \ spoken]]\]
2. The Indirect Dependency Approach

The indirect dependency approach was proposed originally in connection with Hindi scope marking. Hindi is an SOV language but finite complements occur to the right of the verb. In Srivastav (1990; 1991), I claimed that the scope marking structure in (5) and the clausal complementation structure in (6) are parallel. In particular, they both have the S-structure in (7) with the actual complement in right adjoined position and a pronominal or a wh in the preverbal direct object position:

(5) Jaun kyaa soctaa hai ki merii kis-se baat karegli?
J. what-think-PR that M. who-INS talk-DO-F
‘Who does John think Mary will talk to?’

(6) Jaun yeh jaantaa hai ki merii kis-se baat karegli?
J. this know-PR that M. who-INS talk-DO-F
‘John knows it who Mary will talk to.’

Wahba’s terminology is somewhat different in that the scope marker is referred to as a Quantifier Phrase but the idea is the same. Similarly, Bayer’s is a parsing account of the phenomenon but it essentially treats the scope marker as semantically vacuous.

At LF, however, the wh-in-situ move to Spec positions, yielding (8) as the LF for (5) and (9) as the LF for (6).²

The basic claim about the scope marking structure in (8) is that the two wh-expressions do not enter into a direct relationship with each other. Rather, they form two local dependencies, indirectly connected by coindexing of the trace of wh with the CP that dominates wh...

While this view is not radical as far as the S-structure of scope marking goes, given analyses of Hindi complementation (see for example, Davison (1984) and

²Here I only show the complement adjoined to CP in the scope marking structure. I will revise this for Hindi in section 3.2.2 but CP adjunction will still be maintained as an option available in universal grammar.
Malajjan (1990)), other theories impose a direct dependency between embedded argument position and matrix Spec position at the level of transparent LP. The indirect dependency approach does not give matrix scope to the embedded wh-expression at any level of syntactic representation.

A crucial challenge for the indirect dependency approach, then, is to provide a semantics for (8) that would allow answers specifying values for the embedded wh. This part of the proposal was developed in Dayal (1994) and can be summarized very briefly in the following way (see also Dayal (1996) and Bittner (1998)). The wh-expression in the matrix clause is the ordinary wh-expression used to question over propositions, as shown in (10):

(10)  a. Jaun kyaa socaat hai?
      J. what think-PR
      'What does John think?'

b. Jaun socaat hai ki vo tez hai
      J. think-PR that he smart be-PR
      'John thinks that he is smart.'

By analogy to (10), we can take the matrix clause of (8) to be a question over propositions. The adjoined complement, of course, is a question over individuals. The crucial step in the interpretation of scope marking is in defining the semantics of coindexation between the matrix preverbal position and the adjoined complement. Descriptively speaking, the matrix question should only let in those propositions that also belong in the denotation of the complement. Since all natural language quantification is overtly or covertly restricted, this can be accomplished by treating the complement as the restrictor of the matrix wh. We can take kyaa in (8), for example, to quantify over a propositional variable restricted by Ti, a mnemonic for Topic. This yields a set of propositions as the meaning of the matrix question. The complement also denotes a set of propositions and must be filled into the slot occupied by Tj. As we can see, we have two expressions both of which denote sets of propositions at the top CP node.

In order for functional application to go through, the type of one of these has to be raised. As is standard in quantificational structures, syntactic coindexation is interpreted as an instruction for lambda abstraction. Ti is abstracted over and the adjoined clause fei in as argument. This gets us the desired results straightforwardly. It may be worth noting that in cases like (10-a) where there is no embedded question providing the restriction, the variable T is still formally present but its value is contextually determined. One can think of the connection between simple questions like (10) and the matrix of scope marking structures analogously to the relation between questions with who or what and those with expressions like which child or which book.

Under the approach outlined here, the set of possible answers to the question is determined by the matrix wh. In this case, kyaa determines that the quantification will be over propositions that John stands in the think relation to. The restriction, however, requires that the propositions admitted also be members of the complement question. For example, the matrix question here allows sets such as \{John thinks he is smart, John thinks Mary will talk to Sue, John thinks Mary will talk to Bill\}. Once the embedded clause denotation is taken into account, the first proposition in the set will not be admitted so that possible answers will have to be from the set \{John thinks Mary will talk to Sue, John thinks Mary will talk to Bill\}. We get, in effect, the same set of possible answers as in the direct dependency approach where the embedded wh is actually given matrix scope.\footnote{The two approaches make different predictions in the case of yes/no questions, as shown in section 3.1.2. See also section 4.2 for relevant discussion.}

This version of the indirect dependency approach has CPs base generated in adjoined position, coindexing with the covert restrictor of the scope marker. Herburger (1994) has suggested a variant of this analysis in which the scope marker is the head of a DP which takes a CP complement: [who Mary will talk to]. This CP appears in adjoined position because it is obligatorily extraposed. In an overt movement language like German, the S-structure of a scope marking sentence would be something like the following:

(12)  \[
\begin{array}{c}
\text{Spec} \\
\text{DP}_1, \quad \text{TP} \\
\text{CP}_1 \\
\text{CP}_2, \quad \text{you}, \quad \text{think} \\
\text{D} \\
\text{CP}_2, \quad \text{to whom Mary will talk} \\
\text{what} \\
\end{array}\]

DP1 moves from object position to Spec position because it is a who-operator. It contains, however, the trace of the extraposed CP2, which is adjoined to the matrix. In Hindi, an in situ language, the extraposition would occur at S-structure
obtained, is associated with a determiner. However, departure from that proposal. They claim that once a structure

This approach shares with the indirect dependency approach in Dayal (1994; 1996) the view that the scope marker originates in argument position and that it be assimilated with one of the earlier approaches. Herburger’s modification.

As (14-a) shows, if the matrix quantification is over the individual variable x, we must have an instance of x inside the question nucleus. Since think is a verb that takes propositions, not individuals, as its second argument, x cannot function as its second argument. Thus, the only way to get an instance of x inside the propositional variable p is to reconstruct the rest of the material from the adjoined CP (i.e., the proposition denoted by the remnant of the embedded question) into the matrix IP. But then we are dealing with a variant of the direct dependency approach. If, on the other hand, the embedded question is to be interpreted in matrix Spec position, it can only be done if it functions as the restriction of a propositional variable. The proposed coindexing between matrix Q and embedded wth has to be given up at transparent LF. This, then, would place it squarely within the indirect dependency approach.

To sum up, given my characterization of the difference between the direct and the indirect dependency approaches, there are only two ways of making this proposed third approach semantically tenable. One involves reconstruction of the remnant, the other undoes the coindexing of the matrix Q with the Spec of its Spec and makes the original scope marker semantically visible. The first aligns it with the direct dependency approach, the second with the indirect dependency approach. Whatever the motivations for the distinctions argued for by Mahajan, Fanselow, and Horvath, at the interface between syntax and semantics these distinctions are necessarily neutralized. From the present perspective, therefore, their proposals do not constitute a genuine alternative.

3. Variation in Scope Marking

3.1. The Cross-Linguistic Picture

3.1.1. Scope Marking Across Languages

The question I want to explore in this section is whether a single approach to scope marking can apply across languages. The discussion so far has referred to German and Hindi but since van Riemsdijk’s (1982) original observation, scope marking structures have been attested in a number of languages. For example, they have been noted for Bangla (Bayer (1990)), Romani (McDaniel (1989)), Iraqi...
Arabic (Wahba (1991) and Basilio (1998)), and Hungarian (Horvath (1997)). Below I give examples from Bangla, Romani, and Iraqi Arabic in that order. These languages all display the hallmark of scope marking structures in that CP1 contains a wh-expression, analogous to what, and CP2 contains the wh-expression which possible answers specify values for:

(15) a. Tumi ki bhaye-cho ke baar Ri kore-che?
   you what think who house built
   'Who do you think built the house?'
   b. So o Demi misrinol kas i Arifa dikhila?
   what the D. thinks whom the A. saw
   'Who does Demir think Arifa saw?'
   c. Sh-isawwarit Mona Ali naah weyn?
   what thought M. A. went where
   'Where did Mona think Ali went?'

There are other similarities in scope marking structures across languages that I have discussed elsewhere. I will list some of them here without actually elaborating on how they are treated in the direct and indirect dependency approaches (see Dayal (1994; 1996)). I focus only on German and Hindi but the facts are representative of all the other languages mentioned here except for Hungarian, which I discuss briefly at the end of the paper.

In Hindi as well as German, the scope marker is the lexical item used to question over propositions but the embedded question can have any type or any number of wh-expressions. Some examples that illustrate these facts are given below:

(16) a. Tum kyaas socre ho merii khaadN gayii?
   you what think PR M. where go-p
   'Where do you think Mary went?'
   b. Was glaubst du wo Maria getanzt hatte?
   what think you where M. danced had
   'Where do you think Maria had danced?'

(17) a. Tum kyaas socre ho kaan khaadN gayaa?
   you what think PR who where go-p
   'For which person x and place y, you think x went to y?'
   b. Was glaubst du wann Haus an welcher Universitaet studiert hat?
   what think you when H. at which university studied has
   'For which university x and time y, do you think Hans studied at x at y?'

In each language, scope marking structures can be used to express unbounded dependencies, as shown in (18). Possible answers give values for the most deeply embedded wh-expression:5

(18) a. Tum kyaas socre ho merii kyaas khaadN gayaa?
   you what think PR M. what say-p R. where go-p
   'Where do you think Mary will say Ravi went?'
   b. Was glaubst du was Peter meint mit wen Maria gesprochen?
   what think you what P. believes with whom M. spoken has
   'With whom do you think Peter believes Maria has spoken?'

The distribution of scope marking in each language fits in with the generalization that the verb in CP1 must be able to take [wh] complements but CP2 must be a question. This is at least a necessary condition.6

(19) a. Jaun kyaas jaantaa hai merii ravi-se baat kareegii?
   J. what know-PR M. R.-INS talk do-F
   'Jaun kyaas jaantaa hai merii kis-se baat kareegii?'
   J. what know-PR M. who-INS talk do-F
   c. Jaun kyaas puuchtaa hai merii kis-se baat kareegii?
   J. what ask-PR M. who-INS talk do-F

Finally, as noted by Rizzi (1992), scope marking is not acceptable with negation in the matrix clause:

(21) a. Jaun kyaas naliiN socre aa hai merii kis-se baat kareegii?
   J. what not think-PR M. who-INS talk do-F
   'Who doesn't John think Mary will talk to?'
   b. Was glaubst du nicht mit wen Maria gesprochen hat?
   what think you not with whom M. spoken has
   'Who don't you think Maria has spoken to?'

5Van Riemsdijk (1982), McDaniel (1989), and Herburger (1994) report that in such cases each intermediate clause needs to have a scope marker:
   (i) Was glaubst du daß Peter meint mit wen Maria gesprochen hat?
   what think you that P. believes with whom M. spoken has
   'With whom do you think that Peter believes Maria has spoken?'

This fact, however, seems to be subject to dialectal variation in German (Hohle (1991; this volume)). In dialects where (i) is acceptable, presumably (i) is able to move long-distance. I do not discuss this phenomenon further in this paper.

6In section 4.3 I discuss an exception to this generalization.
Explanations for these facts have been attempted within the direct as well as the indirect dependency approaches, which I will not repeat here. I want to reiterate, though, that given the number of facts on which Hindi and German scope marking agree, it is a priori desirable to treat scope marking in both languages along the same lines rather than to posit radically different explanations. In the next subsection, however, I will mention some phenomena that have been pointed out in the literature as being problematic for such an enterprise.

3.1.2. Problems with a Uniform Account of the Phenomenon

In discussing the possibility of a common account for Hindi and German scope marking, I will first point out the problems with extending the direct dependency approach developed for German to Hindi. I will then point out the problems encountered in extending the indirect dependency approach developed for Hindi to German.

There is a conceptual and an empirical reason why the direct dependency approach cannot be applied to Hindi. Consider the fact that the Hindi scope marker typically appears in preverbal position, as schematically represented in (22-a) below:  

\[(22) a. \text{[CP} \text{[IP [Subj kyaa Verb] [CPg ... wh ...]]]}\]

Given that the preverbal position is the one where direct objects occur, it is implausible to suggest that kyaa is an expletive base-generated in operator position. If it is an expletive, it can only be an expletive in argument position. Since the verb takes propositional arguments, kyaa must be considered a clausal expletive and be replaced by a CP. If kyaa were to be replaced by CPg in its surface position, as shown in (22-b), wh-expressions inside CPg would have to move into the matrix Spec position in order to yield the right interpretation. However, the pronominal counterpart of this construction (cf. (6) in section 2.2) arguably has this structure at transparent LF but it does not allow direct question readings, suggesting that Hindi finite clauses remain scope islands for wh-in situ even if they move to the preverbal position at LF. The derivation in (22-b), therefore, would simply be ruled out as a violation of the selectional restrictions of the matrix verb. If, on the other hand, the scope marker moved to operator position first and was then replaced by CPg, as in (22-c), some maneuvering would be needed to give scope to the embedded wh and the remnant CP would have to be reconstructed in object position. As we saw in section 2.3, such proposals have indeed been made (Mahajan (this volume) and Fanselow & Mahajan (this volume), for example). The point to note though is that these maneuvers are construction specific and unattested elsewhere in the grammar. This, it seems to me, poses a non-trivial conceptual problem for this approach.

In addition to these theoretical considerations, there is also an empirical argument against adopting the direct dependency approach for Hindi. In the case of scope marking structures with yes/no questions it leads to incorrect predictions. Consider the following:

\[(23) a. \text{Ravi-ne kyaa bahan ki annu sayegi yaa nahiin?}\\ \text{R-E what say-p that A. come-f or not}\\ \text{What did Ravi say, will Ann come or not?}\]

\[(23) b. \text{Ravi-ne bahan ki annu (nahiin) sayegi}\\ \text{R-E say-p that A. (not) come-f}\\ \text{Ravi said that Ann will (not) come.}\]

\[(23) c. \#Ravi-ne (nahiin) bahan ki annu sayegi ya nahiin\\ \text{R-E (not) say-p that A. come-f or not}\\ \text{Ravi said/didn't say whether Ann will come.}\]

Such examples have not been discussed by proponents of the direct dependency approach but it is easy to see what the theory predicts. A yes/no question about CPg would be a question about Ravi’s saying or not saying something. That is, it would denote the set of propositions in (24-b) and would yield unacceptable answers like (23-c). In point of fact, the question poses alternatives about CPg. The indirect dependency approach predicts acceptable answers like (23-b) since it assigns (24-a) as the denotation of the question:

\[(24) a. \text{Ap [p=\text{\#will-come}(annu)] v p=\text{\#say}(ravi,q)}\\ \text{Ap[p=\#say(ravi,will-come(annu)) v p=\#say(ravi,\#will-come(annu))]}\]

We must accept, then, that the direct dependency approach cannot be correct for Hindi. Let us now see why extending the indirect dependency approach to German does not proceed smoothly either. In Dayal (1994; 1996), I argued that scope marking in German is also amenable to the indirect dependency approach. The basic thesis there was that German, like Hindi, has the scope marker originate in argument position, and is coindexed with a CP in adjoined position. It differs from Hindi in having the scope marker move to Spec position at S-structure instead of at LF. In other words, I claimed there that German displays at S-structure what Hindi achieves only at LF. Problems with this view of German scope marking have been pointed out. One argument against it comes from the unacceptability of yes/no questions:

\[(25) a. \text{Ap [p=\#say(ravi,\#will-come(annu))]} \& p=\#say(ravi,q)\\ \text{Ap[p=\#say(ravi,will-come(annu)) v p=\#say(ravi,\#will-come(annu))]}\]

\[(25) b. \text{Ap [p=\#say(ravi,\#will-come(annu))]} \& p=\#say(ravi,\#will-come(annu))\]

In the case of verbs like think, an answer might have negation in the matrix but only a neg-raised reading will be possible, as predicted.

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Footnotes:

7 Hindi allows scrambling so that kyaa may occur elsewhere, but the intuitions about basic word order suggest that it is generated in preverbal position.

8 Rothstein (1995) identifies a number of syntactic and semantic/pragmatic differences between true expletives and argumental pronouns linked to an adjunct. In Dayal (1996), I have shown that the preverbal pronoun in Hindi examples like (6) has argumental status, in terms of the distinctions argued for by Rothstein. If the Hindi scope marker is really a wh-counterpart of an argumental pronoun, it seems problematic to me to think of it as an expletive element that undergoes replacement at LF.
the development of a spectrum of possibilities extending from indirect to direct dependency over time is plausible. I will show, however, that empirical considerations indicate that the full spectrum is not utilized. All of the attested variants fall within the indirect dependency end of the scale.

3.2. Cross-Linguistic Variation in Indirect Dependency

3.2.1. Sequential Scope Marking

In Dayal (1996), I proposed that contrary to popular belief scope marking is a universal phenomenon. This observation is a good starting point for the account of cross-linguistic variation I want to develop. Take English, for example, which does not allow the kind of scope marking structure we have been looking at. It does, however, have scope marking of a different kind. (27-a) instantiates a subordination structure and is unacceptable but (27-b) instantiates a sequence of questions which has properties characteristic of scope marking:

(27) a. *What do you think who Mary will see?
   b. What do you think? Who will Mary see?
   c. I think Mary will see Tom

Note that possible answers to (27-b), such as (27-c), give values for the \( wh \) in CP\(_2\), not for the \( wh \) in CP\(_1\). Furthermore, in doing so, they embed the proposition corresponding to CP\(_2\) as the complement of the verb in CP\(_1\). Clearly, English sequential questions must be viewed as scope marking constructions since they have a \( wh \)-expression that seems to be semantically inert and a \( wh \) that can be construed as taking scope outside its syntactic domain.\(^{11}\)

That such sequential questions instantiate the scope marking phenomenon is also shown by the fact that they are subject to similar constraints. The examples in (28) illustrate this with respect to the properties discussed in section 3.1:

(28) a. What do you think? Who will go where?
   b. What do you think? What will he say? Who should go?
   c. *What did she ask? Who is coming?
   d. *What do you think? Mary is here.
   e. *What don’t you think? Who is coming?

(28-a) shows that it is possible to have more than one \( wh \)-expression in CP\(_2\) resulting in a pair-list answer. (28-b) shows that it is possible to do multiple

\(^{10}\)Since the terms matrix and embedded are inappropriate in the context of sequential questions, we will rely more heavily on the linear-oriented terminology from this point on, referring to the clause that contains the propositional \( wh \)-expression as CP\(_1\) and the clause that follows it as CP\(_2\). This is intended to maintain neutrality with respect to the syntactic relation between the two clauses, while emphasizing the connection between sequential and subordinated scope marking structures.

\(^{11}\)The contrast is with a sequence of questions encoding separate requests for information. The following is illustrative:

(f) a. Who called? What did she/he want?
   b. Mary called. She wanted to know if you are free.
sequencing. (28-c) and (28-d) show that the verb in CP₁ must be able to take [-wh] complements, that is, allow for quantification over propositions, and that CP₂ must denote a question, that is, a set of propositions. Finally, (28-e) shows that negation is disallowed in CP₁. To complete the picture, consider what happens when CP₂ is a yes/no question. A possible answer chooses between alternatives of CP₂ and embeds the selected proposition as the complement of the verb in CP₁:

(20) a. What did she say? Will Mary come?
   b. Yes, she said that Mary will come.
   c. No, she said that Mary won’t come.

Now, sequential questions obviously cannot be handled in a direct dependency approach since wh-movement cannot take place across distinct clauses. There is, however, a straightforward explanation within the indirect dependency approach. We might take the first question to involve quantification over propositions and the second question to involve an ordinary question, along the lines sketched in section 2.2. The issue is to connect up T₁, the topic variable restricting the propositions under consideration in the first question, by the second question. This could be thought of as a cataphoric relation of the kind that occurs in right dislocation or other cases of backward anaphora. English sequential questions, then, may be syntactically distinct from Hindi scope marking structures but can, and indeed must, be handled within the indirect dependency approach.

A similar observation is made by Reis (this volume) who draws attention to similarities between was-parentheticals and was ... w-constructions in German, for example, is a parenthetical involving two independent clauses since it displays V2 in CP₂. (30-b) is a was ... w-construction and involves subordination as shown by the absence of V2 in CP₂. The former is what I have called sequential scope marking in the case of English, the latter is the subordinated scope marking structure we have been looking at in this paper:

(30) a. Was glaubst du, wohin ist er gegangen?
   b. Was glaubst du, wohin er gegangen ist?
   c. No, she said that Mary won’t come.

Let us familiarize ourselves with the core features of these syntactic possibilities. Juxtaposition of CP₁ and CP₂ in (31-a) involves adjunction at the CP level. The two clauses are syntactically independent, neither being subordinate to the other. At the same time, there is semantic integration of the two, signalled here by the coindexation of the wh-expression in CP₁ with CP₂. The mechanism for effecting this integration is as presented in section 2.2 where the meaning of CP₂, a set of propositions, fills in for the covert restriction on the scope marker, a propositional

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12One difference between English sequential scope marking and German was-parentheticals is that the latter do not allow multiple sequencing, as in (28-b) (cf. Reis (this volume)). My German informants, however, did not have a problem with multiple sequencing.
variable, via lambda conversion.\(^\text{13}\) (31-b) and (31-c) differ from (31-a) in according subordinate status to CP\(_2\) by generating it below the LF position of its semantic host, the scope marker. CP\(_2\) undergoes indirect syntactic subordination when it occurs adjoined to IP and is linked to the restriction on the scope marker, which is the complement of the matrix verb. The scope marker and CP\(_2\) may be generated as discontinuous constituents, in which case we posit a null element inside the \(<s>\) expression with which CP\(_2\) can be coindexed. Alternatively, CP\(_2\) itself could be generated inside the \(<s>\) expression and be extraposed at S-structure, leaving behind a coindexed trace. The choice between the two is not significant, for present purposes. What is crucial is that CP\(_2\) should be able to move into the position of the restrictor as an instance of replacement or reconstruction, yielding a structure like \([$cp_1 [\text{what} [cp_2 \text{where he should go }]] \quad [\text{if you think } t_1] \quad \text{at transparent LF.} \) The interpretation then proceeds as in the original version of the indirect dependency approach, except that the meaning of CP\(_2\) does not have to be inserted into the meaning of the scope marker by lambda conversion. It is already in target position at transparent LF.\(^\text{15}\)

There is a third option, schematized in (31-c), that we might consider for scope marking. Here the scope marker is generated in Spec of CP\(_1\) while CP\(_2\) is in argument position. If we treat the scope marker as an existential quantifier (over propositional variables) with a syntactically visible but phonologically null restrictor coindexed with CP\(_2\), CP\(_2\) can move into this position at LF. The interpretive procedure for this structure would then fall straightforwardly within the indirect dependency approach, analogously to the case of indirect subordination. Note that the structure in (31-c) essentially incorporates van Riemsdijk’s proposal about the positions in which the scope marker and CP\(_2\) are generated. These syntactic assumptions have generally been thought to go hand in hand with a direct dependency between scope marker and embedded \(<s>\) expressions but they are equally compatible with an indirect dependency approach to scope marking.

We see, then, that a range of options exist for the syntactic realization of indirect dependencies in scope marking. It is time now to ground these possibilities empirically. Beginning with the CP adjoined structure in (31-a), recall that it is the one I had proposed in earlier work for scope marking in all languages (Dayal 1994; 1996). While I had drawn parallels between English sequential scope marking and Hindi subordinated scope marking in Dayal (1996), there are differences between them that I had not noted there. A consideration of these differences has led me to depart from my earlier position to say that CP adjunction holds only for sequential scope marking, which I assume is universally available and which we have illustrated above with respect to English (27)-(29) and German (30-a). The syntactic independence of CP\(_2\), under this account, correctly predicts inversion in English and V2 effects in German. The interpretive procedure is ideally suited for sequential scope marking, obviating as it does the need for syntactic movement to Spec of CP\(_1\). The structures in (31-b) and (31-c), on the other hand, in assigning subordinate status to CP\(_2\) ensure that it will display behavior typical of such clauses. In Hindi, the adjoined CP\(_2\) optionally has the complementizer \(ki\) and in German CP\(_2\) does not show V2 effects.

Further evidence in favor of this core structural distinction between syntactic juxtaposition and subordination is also available. Consider (32)-(33) with a universal quantifier in CP\(_1\) and a pronoun in CP\(_2\). A bound variable reading for the pronoun is impossible in (32) but readily available in (33).\(^\text{16}\)

\begin{align*}
(32) &\quad a. \text{Was glaubt jeder, wo/in \text{er} gehen \?} \\
&\quad \text{What thinks everyone where he go \?} \\
&\quad \text{Where does everyone think he will go?} \\
&\quad \text{Which does everyone think he will go?} \\
&\quad \text{Where should he go?}
\end{align*}

\begin{align*}
(33) &\quad a. \text{Was glaubt \text{er}, wo/in \text{er} gehen \?} \\
&\quad \text{What thinks everyone where he go \?} \\
&\quad \text{Where does everyone think he will go?} \\
&\quad \text{Which does everyone think he will go?} \\
&\quad \text{Where should he go?}
\end{align*}

Below the present proposal these facts have a simple explanation. In the case of (32), there is no c-command relation between CP\(_1\) and CP\(_2\), so the pronoun inside CP\(_2\) cannot be considered syntactically bound. Consequently, it denotes a free variable. Without getting into details of the interpretation for questions with quantifiers at this point (see section 4.1), it can still be shown why the bound

\(^{13}\) There is no particular reason for ruling out a complex syntactic structure in which the scope marker takes a phonologically null but syntactically visible complement \([p_1 \text{what} p_2]\). Crucial for the account is the semantic type of this element. Since the scope marker involves a propositional variable of type \(<s>\), its restriction, whether implicit or syntactically visible, must be a set of propositions of type \(<<s>,<\text{type}>\>\).

\(^{14}\) The order of relevant elements in Hindi, on which the schema here is based, is verb, inflectional elements, CP\(_2\), suggesting IP adjunction. However, VP adjunction would also count as indirect subordination. The question of the level at which adjunction occurs is orthogonal to the distinction I would like to make here.

\(^{15}\) Making the restriction a syntactically visible target for movement is motivated by considerations of compositionality. If CP\(_2\) is left adjoined to IP (or VP) at transparent LF, its meaning will have to be held in store until Spec of CP\(_1\), where the scope marker is interpreted. Without a suitably articulated mechanism for storage, this is problematic (see Dayal (1994; 1996) for discussion). There is also strong empirical motivation for (31-b), as will be discussed shortly.

\(^{16}\) In Dayal (1994), I had mistakenly thought the bound variable readings to be unavailable for structures like (33-a). In fact, they are unacceptable only for the corresponding sequential case in (32-a). I am grateful to Sigrid Beck, Miriam Butt, and Steve Berman for pointing out my error. See also Beck & Berman (this volume) for this. Thanks also to Anoop Mahajan and Miriam Butt for confirming the judgments for Hindi. And to Susanne Preuss for judgements of the key German data in this paper.
variable reading is ruled out. Since CP₁ and CP₂ only merge in the semantics in such structures, the binding of the variable denoted by the pronoun would have to be done at the point where the meaning of CP₂ is lowered into CP₁. However, lambda conversion is proscribed in those instances where a variable that is free becomes bound in the process of such conversion. The bound variable reading for the pronoun is thus predicted to be impossible. (33), on the other hand, represents a very different situation. CP₂ is either syntactically linked to a position that is c-commanded by the subject or directly c-commanded by the subject at D-structure so that pronoun inside it meet the structural requirement for binding. Furthermore, since CP₂ syntactically replaces the topic variable before interpretation, the need for lambda conversion is obviated and the issue of illegal lambda conversion becomes moot. We simply have an instance of a syntactically bound pronoun with the appropriate semantics.17

Let us turn now to the distinction between indirect subordination of CP₂, as in (31-b), and full-blown subordination, as in (31-c). The canonical case of indirect subordination is Hindi where the scope marker appears in complement position and CP₂ is clearly adjoined. Now, in earlier versions of the theory I had proposed that German is similar to Hindi in these respects but, as we saw, this view has been challenged. Recall that a strong empirical argument against it and in favor of the direct dependency approach for German came from the position of the scope marker in superiority cases such as (26-b)-(26-c). In this respect (31-c), although it encodes an indirect dependency, achieves the same results as direct dependency accounts of the phenomenon.

One disadvantage of adopting this line for German, however, is that it weakens the link between simple questions and scope marking constructions, an appealing aspect of the original version of the indirect dependency approach. In the first case, the wh is generated in argument position while in the second, a wh with the same meaning is generated in operator position. If an alternative account for superiority contexts were available, one could then retain a unified account for the two structures in terms of indirect subordination. With this in mind, let us rethink the problem.

Following suggestions of Gereon Müller, I will present one way of getting the attested superiority facts while assuming a structure essentially similar to (31-b) for German. Consider (34), the representation of the unacceptable (26-b) after LF movement of the scope marker. For expository reasons I have indexed CP₂ and its trace i and the scope marker and its trace j. Given that a quantifier and its restriction do not carry distinct indices, however, we should keep in mind that i is identical to j. The corresponding simple question in (26-a) is repeated below:

\[ \text{(34)} \]

In (34), the subject is in Spec at S-structure, so the scope marker must adjoint to it at LF. Such adjunction is not problematic in the simple case, but in scope marking there is a trace inside the wh-phrase coindexed with the adjoined CP₂. This adjoined CP₂ has to move into this position before interpretation can take place but such movement could be ruled out since the host is not in a higher position, it is merely adjoined to a higher position. Thus, there is a possible account for the contrast between the two cases with respect to the position of was that does not involve generating the scope marker in operator position.

To the extent that there are no other attested instances of wh-expressions generated in operator position, expletive or otherwise, the elimination of (31-c) as a possibility would be a welcome result. I will leave this open, however, noting simply that if the guiding intuition for German is that CP₂ is the actual argument and the scope marker begins its life as an operator, (31-c) provides a way of reconciling that intuition with the view that the scope marker, though it may contain an expletive element, is itself semantically contentful.

3.2.3. Against Semantic Variation in Scope Marking

I have argued above that variation in scope marking may range from simple juxtaposition of two standard questions to a non-canonical structure in which the scope marker is base-generated in operator position while its restriction occurs in complement position. The locus of variation, in other words, is the syntax not the semantics of scope marking. Stechow (1996), commenting on this proposal, notes that a further stage of development could be hypothesized for scope marking where a wh-expression generated in operator position loses its link with CP₂ and becomes a wh-expletive which must be replaced by regular wh-expressions. That is to say, structures like (31-c) could evolve in such a way that the semantics catches up with the syntax, resulting in a wh-expression generated in operator position which has no theta role and no semantic content. German scope marking may well represent this later stage of development. In this subsection, I would like to show that this possibility is not, in fact, realized in German. I will present below

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17The configuration \([[\text{cp}_1 \ldots \text{pro}_1] \text{CP}_1 \ldots \text{R-expression}_i \ldots \text{]}\) is ruled out in sequential as well as subordinated scope marking. In subordinated structures this could be explained as a Principle C violation but that cannot be invoked for sequential scope marking. I assume therefore that this fact does not have an explanation in structural terms but must be dealt with by whatever principles rule out such possibilities in regular discourses like She saw in Mary sat down.
four arguments that show this quite clearly. German is crucial in determining whether variation in the semantics of scope marking is attested because sequential scope marking can only be treated in terms of indirect dependency and yes/no complements establish unequivocally that Hindi scope marking reflects an indirect dependency.

The first argument showing that the German scope marker is not an expletive which is replaced by wh-expressions is based on an example from Hohle (this volume). In (35-a), CP₂ is a conjunction of questions and the answer specifies values for the wh in each conjunct. Not much attention has been paid to such examples but extraction of embedded wh-expressions would clearly lead to a violation of the co-ordinate structure constraint. Under an indirect dependency approach such cases pose no special problem. Since a conjoined question has the same semantic type as a simple question, CP₂ can readily function as the restriction of the scope marker:

(35) a. Was meint er wann sie kommt und wen sie mitbringt?
   "What thinks he when she comes and who she brings"

b. Er meint daß sie um zwei kommt und daß sie Karl mitbringt
   "He thinks that she at two comes and that she Karl brings"

Parasitic gaps provide another testing ground for the semantic status of German scope marking. Consider (36) from Sabel (this volume):

(36) Wen hat [ohne e1 wirklich zu glauben] Hans gemeint [t₂ daß
what has without openly to pronounce H. thought
was₁ Maria t₂ liebt]?
whom M. loves
"What has Hans thought without openly pronouncing (it), whom does Maria love?"

The empty category inside the adverbial phrase being propositional, Fanselow & Mahajan argue that such gaps are licensed by the wh-chain [CP, was₁ ... t₁ CP₂], where they take was to be generated in argument position. There are two objections that have been raised in this connection: First, von Stechow notes that the gap could well be licensed by extraposition of CP₂. If so, there is no evidence from parasitic gaps of a wh-chain linking was and the object position. That is, the gap in (36) would also be compatible with the wh-chain formed by direct dependency between was and the embedded wh [was₁ ... t₁ [CP₂, wh₂ ... t₂]]. Sabel, on the other hand, makes the point that German has pseudo parasitic gaps, not

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18German also has a construction in which a copy of the embedded wh appears in each of the higher clauses, generally referred to as a w ... w-construction, as opposed to was ... w-construction, the name used for scope marking. The w ... w-construction appears to encode the same constraints as extraction and does not allow conjoined questions in embedded position.

19Thanks to Gerres Müller for pointing out the relevance of this example. See also Horvath (1997) for discussion of parasitic gaps in Hungarian scope marking.

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real ones, and argues that evidence from parasitic gaps cannot be used to test for wh-dependencies.

In spite of these objections, I think there is substance to the claim that such gaps reflect indirect dependency. To see this, we might compare the behavior of gaps in scope marking and extraction structures:

(37) a. Wen hat Hans [ohne e1 wirklich zu treffen] gemeint [t₂ daß
who has H. without really to meet thought that
Maria t₂ mögen würde]?
M. like would
"Who is such that Hans, without really meeting (him), thought that
Maria will like him?"

b. Wen₁ hat [ohne e1 wirklich zu glauben] Hans gesagt [t₂ daß
who has without really to believe H. said that
Maria t₂ liebt]?
M. loves
"Who is such that Hans, without believing (that she loves him), said that
Mary loves him?"

c. Was₁ hat Hans [ohne e1 wirklich zu treffen] gemeint [CP₂, wen₁ what has H. without really to meet thought who
Maria t₂ mögen würde]?
M. like would
"Who is such that Hans, without really meeting (him), thought that
Maria will like him?"

The extraction structures in (37-a)–(37-b) have a wh-expression (over individuals) in Spec of CP₁ which is linked to an embedded argument position. While (37-a) has a gap of the same type, the gap in (37-b) has a propositional meaning and this results in a sharp contrast in acceptability. Assuming that CP₂ appears in an A’ position due to extraposition in both cases, we can see that licensing of the parasitic gap, real or pseudo, does take into account the wh in Spec of CP₁. Setting aside the murky issues surrounding parasitic gaps in German, one generalization that we can safely make is the following: if there is a wh-expression in Spec of the CP that hosts a gap, the identity of the gap must match that of the wh-expression, regardless of whether there is an extrapoosed finite clause in A’ position. The example in (37-c), with a scope marker in Spec of CP₁ and an individual denoting gap, completes the paradigm. If the scope marker were conjoined with the individual-denoting wh-expression in CP₂, as in the direct dependency approach, the sentence would be predicted to be good. That it is not, shows that the wh-chain formed by was is propositional.

There is other evidence that favors the indirect dependency approach for German. Herburger (1994) points out that there is a difference between scope marking and extraction with respect to de re and de dicto readings. As she puts
it, a question that involves extraction leaves it open whether the speaker accepts the presupposition behind the embedded question while a scope marking structure implies that the speaker is committed to it. This is expected if extraction and scope marking structures encode direct and indirect dependencies respectively. Herburger's observation is based on German examples like (1-a) and (1-b). Here I will attempt to make it accessible by embedding English extraction structures and sequential questions in contexts that bring out the distinction she notes:

(38) a. I know no one will volunteer to help. But what does Mary think will volunteer?
b. #I know no one will volunteer to help. But what does Mary think? Who will volunteer?

(39) a. Speaker A: No one ever helps clean up. I know that and you know that but Mary apparently doesn't.
   Speaker B: So who does Mary think will help clean up?
b. #Speaker A: No one ever helps clean up. I know that and you know that but Mary apparently doesn't.
   Speaker B: What does Mary think? Who will help clean up?

The effects are subtle, but the contexts in (38) and (39) bring out Herburger's intuitions about the difference in presuppositions between extraction and scope marking questions. It is a well-known property of natural language that domains of quantification are presupposed to be non-empty. The whole CP2 forms the restriction in the indirect dependency approach, while in the direct dependency approach only the common noun restricts the quantification. Now, the context makes it clear that the speaker does not believe the existential presupposition behind CP2 and the use of a scope marking structure is odd. On the other hand, the context presupposes a non-empty set of individuals who, in Mary's opinion, might be expected to help. The extraction structure is therefore acceptable. The difference in presuppositions shows up here because the verb in CP1 is non-factive. CP2 in scope marking structures, but not in the extraction structures, is interpreted outside the scope of the matrix verb. Its presuppositions are therefore inherited by the whole structure.

In addition to these empirical arguments, there is also a conceptual argument to be made against direct dependency for German. As is well known, a scope marker cannot be associated with a wh-expression in its own clause, a phenomenon dubbed anti-locality in the literature (see von Stechow (this volume) and Fanselow & Mahajan (this volume));

(40) a. *Was ist wer gekommen?
    what is who come
   *Who came?

Herburger's observation is based on German examples like (1-a) and (1-b). Here I will attempt to make it accessible by embedding English extraction structures and sequential questions in contexts that bring out the distinction she notes.

b. *Was glaubt wer dass Maria Karl liebt?
   what believes who that M. K. likes
   *Who believes that Maria likes Karl?

Now, there clearly is no principle of synchronic grammar that can be invoked to enforce anti-locality and the only way to derive it in the direct dependency approach is by stipulation. Given the perspective of historical change from indirect to direct dependency that we are considering, however, one might ask the question whether anti-locality is simply a residue of an earlier stage in the derivation of scope marking. Consider though what would have to happen to create this situation. The scope marker would have to change from a propositional wh-expression linked to CP2 to become an expletive. Its link to CP2 would not simply be erased, but rather replaced by a link to wh-expressions, with the proviso that such expressions may not be in the same clause. My understanding of historical change is certainly not deep enough to make strong claims, but it seems to me that such a proposal would not have much explanatory power. Under the indirect dependency approach, of course, anti-locality is a straightforward consequence of the core semantics of scope marking.

To sum up this section, earlier claims that languages differ in encoding indirect vs. direct dependencies left unexplained the great degree of overlap between various types of scope marking within and across languages. In a view that sees direct dependency as evolving from indirect dependency, the claim can be made without loss of explanatory adequacy. However, it is a matter for empirical investigation whether the change from syntactic juxtaposition to embedding is accompanied by a semantic shift from a contentful wh-expression restricted to a question to a wh-expression whose only role is to indicate scope. The unavailability of yes/no complements in German, the only language in the sample for which direct dependency is even a possibility, makes it impossible to determine the issue on the basis of possible answers – as we know, in every other case direct and indirect dependencies predict identical answers. I hope to have shown here, however, that there is enough evidence to place German scope marking squarely within the indirect dependency approach. The spectrum of cross-linguistic possibilities, then, does not extend from indirect to direct dependency but from indirect dependency without syntactic subordination to indirect dependency with increasing subordination, as schematized in (31-a)-(31-c).

4. Some Further Issues

4.1. Intervening Effects and Traces

I would now like to evaluate what may be thought of as open issues in the literature from the perspective of variation in scope marking sketched above. I will first consider intervention effects, explanations for which have been proposed within the direct dependency approach. I will show that these explanations transfer over to the modified indirect dependency approach without any additional stipulations. Thus intervention effects cannot be used as arguments for one approach
over the other. I will then consider restrictions on embedding verbs that I believe remain equally elusive, at the present stage of our understanding, under both approaches. Finally, I will comment briefly on the status of two properties that have been discussed in relation to Hungarian scope marking in the languages we are focusing on here.

As mentioned earlier, scope marking structures are sensitive to negative islands (Rizzi 1992, Herburger 1994, Dayal 1994; 1996, and Beck 1996)). The relevant example is repeated in (41-a) with the corresponding extraction structure in (41-b). Another kind of intervention effect, noted by Pafel (this volume), has to do with the potential ambiguity of questions with quantifiers. Pafel notes that the scope marking structure in (42-a) only allows pair-list answers like Karl thinks the best wines grow in France and Maria thinks the best wines grow in Italy. The corresponding extraction structure in (42-b) is equally compatible with pair list answers or with individual answers like Everyone thinks the best wines grow in France:

\[(41)\]
a. *Was glaubt du nicht mit wen Maria gesprochen hat? [what think you not with whom M. spoken has]
b. Mit wen glaubt du nicht dass Maria gesprochen hat? [with whom think you not that Maria spoken has]

‘What don’t you think, who has M. spoken to?’

\[(42)\]
a. Wo meint jeder wo die besten Weine wachsen? [where believes everyone where the best wines grow]
b. Wo meint jeder dass die besten Weine wachsen? [where believes everyone that the best wines grow]

‘Where does everyone think the best wines grow?’

\[(43)\]
a. *cp... negation/quantifier... ti\textsubscript{LF}
b. [cp wh... [ip v/negation... [cp... ti...]]]
c. [cp \textsubscript{ LF} v\textsubscript{ LF} wh... [ip t\textsubscript{i} ... [cp ... ti...]]]

Beck (1996) accounts for these differences by proposing that traces created at LF, unlike those created at S-structure, may not cross over negation or quantifiers, as shown in (43-a). She explains the data in (41)-(42) by positing LF movement of the embedded wh in scope marking structures as opposed to S-structure movement in extraction structures. This straightforwardly predicts the contrast with respect to negation, depending on whether the configuration (43-b) is created at LF or not. The explanation for the data in (42) builds on the view that individual answers to questions derive from an LF like (43-b) in which the universal is inside the scope of the wh, while list answers derive from an LF like (43-c) in which the universal has scope over the wh (see also May 1985, Groenendijk & Stokhof 1984, Chierchia 1993, and Dayal 1996)). In order to derive the individual answer, the embedded wh must cross over the universal. The configuration in (43-b) is problematic only for scope marking because it creates traces at LF. The pair list answer involves the additional movement of the universal. As the configuration in (43-c) shows, the universal does not intervene between the wh and its scope so the level at which the configuration is created is not important. Scope marking and extraction therefore both allow list answers.

As would be obvious, Beck’s account of the facts in terms of LF traces applies equally well to German subordinated scope marking, under the present version of the indirect dependency approach. As such, it does not constitute an argument in favor of one approach or the other. For instance, whether the scope marker is generated in argument or operator position, CP\textsubscript{2} at least will have to cross over negation in the case of (41), leaving behind an LF trace. Similarly, in the case of (42), we can count on CP\textsubscript{2} to create a trace at LF. The constraint in (43-a) cannot discriminate between the configurations in (43-b)-(43-c) and (44-a)-(44-b):

\[(44)\]
a. cp [ wh ([CP\textsubscript{2}... i]) [ip... negation/\forall ... ti_i]]
b. [cp \textsubscript{ LF} v\textsubscript{ LF} [wh ([CP\textsubscript{2}... i]) [ip t\textsubscript{i} ... ti_i]]

Another point worth noting is that sequential scope marking also does not allow negation in CP\textsubscript{1}. The relevant example is repeated below in (45-a). Since sequential scope marking does not create traces, (45-a) cannot be used to explain the unacceptability of negation. An alternative explanation such as the one in Dayal (1994; 1996) would still be needed. Summarizing briefly, the basic idea there is that negative questions in general are only possible with D-linked domains of quantification, as an examination of (45-b)-(45-c) shows:

\[(45)\]
a. *What don’t you think? Where should we go?
b. Who come to the party?
c. Who didn’t come to the party?

While one can easily ask (45-b) without knowing the set of individuals from whom possible values for who may be picked, this knowledge is presupposed in (45-c).

The reason for the impossibility of negation in sequential scope marking is due to the fact that if Ti is D-linked, as negative questions require it to be, the value of this variable will be a contextually given set of propositions. There will be no free variable available for functional application to take place and the meaning of CP\textsubscript{2} will remain unintegrated.

We see, then, that an account of the negative island effect for scope marking is available without appealing to traces. The question then arises whether the same would not apply to structures in which traces are at issue, given that the facts are parallel. While it is certainly possible that one explanation is correct...
for subordinated scope marking and another for sequential scope marking, the need for two separate accounts takes away from the generality of Beck’s account. One might also wonder about the deeper reasons behind Beck’s generalization but, for present purposes, it is enough to note that the explanation is consistent with the view established in section 3.2.3 that German subordinated scope marking encodes indirect dependencies involving LF movement of CP₂ rather than extraction of wh-expressions inside it.

4.2. Lexical Restrictions in Scope Marking

In this section I would like to take a closer look at properties that separate Hindi and German subordinated scope marking to see whether they shed light on the structures under consideration. The standard generalization about scope marking is that the verb in CP₁ should select [−wh] complements and CP₂ must be a question. While this generalization essentially holds for English sequential scope marking and for Hindi subordinated scope marking, additional restrictions in German subordinated scope marking are known to exist.

Beginning with CP₂, recall that yes/no questions are acceptable in English and Hindi scope marking but unacceptable in German subordinated scope marking. This has been taken as evidence against indirect dependency and in favor of direct dependency for German under the view that the yes/no operator cannot undergo movement at LF (Beck & Berman (this volume) and von Stechow (this volume)). ²² There is, however, an alternative explanation, due to Reis (this volume), which is neutral with respect to the nature of the dependency. Note that in Hindi a matrix question, wh or yes/no, and the corresponding embedded question have the same syntactic structure. The only effect of subordination is in the optional addition of the complementizer ki. In German, both types of questions manifest a shift from V2 to V-final word order. Additionally, yes/no questions require the insertion of the complementizer ob. If subordinated scope marking is a grammaticalization of two independent clauses in juxtaposition, the insertion of a yes/no complementizer involves an extra operation that may not be tolerated.

²²Beck & Berman consider CP₂ with wh-phrases like wieso (‘why’) unacceptable and propose that they are lexically banned from participating in wh-chains. This lexical property would be independently attested if wieso could not be extracted, that is, if (iii) were not an acceptable answer to (ii):

(i) *Was glaubst du, wieso Maria getanzt hat? what believe you why M. danced has
(ii) Wieso glaubst du, dass Maria getanzt hat? why believe you that M. danced has
(iii) Wohin ziehst du, woher kommt sie? where move you where comes she
   *Because she is relaxing → found
   'Because she found it relaxing.'

There seems to be some difference in judgements with respect to these examples. Both my informants accepted (i) while only one of them accepted the question/answer pair in (ii)/(iii). I am not sure what to make of the data at this point but it is clear that even if there is a restriction on wieso in CP₂, this restriction is not of the same order as the restriction on ob-clauses. I am therefore, setting aside this example.

Under this view, the possibility of yes/no questions as CP₂ has little to do with whether the language has direct or indirect dependency. It is solely determined by the structural relationship of matrix and embedded yes/no questions. Though it remains to be seen how this generalization bears up under further cross-linguistic investigation, it provides an explanation that is compatible with the conclusion of section 3.2.3 that German scope marking does not instantiate direct dependency.

Assuming that the restriction against ob clauses can be so explained, let us turn our attention to restrictions on embedding predicates. It is well known that German subordinated scope marking does not occur with strong factive predicates like bedauern (‘regret’) (cf. (46-a)), berücksichtigen (‘take into account’) or sich entsetzen (‘be appalled’). This is potentially an argument for direct dependency in German since extraction across factive islands is also impossible (cf. (46-b)). This argument, made by Müller & Sternefeld (1996) for example, is invalidated, however, by the fact noted by Reis (this volume) that such predicates are not attested in German sequential scope marking either (cf. (46-c)). Comparing subordinated scope marking in German with sequential scope marking, then, changes the nature of the argument:

   b. Wohin bedauerte sie dass Hans ging? where regretted she that H. went
   c. *Was bedauerte sie wohin ging Hans? what regretted she where went H.

The data in (47) show that the set of (subordinated) scope marking predicates is not co-extensive with the set of extraction predicates (see von Stechow (this volume)). In each case, though, the former patterns with sequential scope marking:

(47) a. Was hast du entschieden/*dich erinnert wer kommen soll? what have you decided/refer remembers who come should
   b. Wer hast du *entschieden/dich erinnert dass kommen soll? who have you decided/refer remembers that come should
   c. Was hast du entschieden/*dich erinnert wer soll kommen? what have you decided/refer remembers who should come

This, of course, is consistent with the view that subordinated and sequential scope marking are historically connected. In spite of this, it would be hasty to conclude from these facts that there is clear evidence of indirect dependency in German subordinated scope marking. The following examples from Reis (this volume) strike a cautionary note since subordinated scope marking and extraction line up against sequential scope marking with respect to predicates like behaupten (‘claim’), vorschlagen (‘suggest’), erzählen (‘tell’), and argwöhnen (‘suspect’):

(48) a. Was behauptest du wieviel das kostet? what claim you how much this costs
b. Wieviel behauptet du daß das kostet?
how much claim you that this costs

c. *Was behauptet du wieviel kostet das?
what claim you how much costs this

Reis takes these predicates to be analogical extensions of the verb classes admissible in sequential scope marking. She concludes that only predicates belonging to the class that is attested in sequential scope marking occur in subordinated scope marking. Note though that strong factives, which may be considered to rightly belong to the relevant class, are still not attested in subordinated scope marking.

Our earlier understanding of the facts was that the set of predicates allowed in German subordinated structures was more restricted than in corresponding Hindi structures. Consequently, the search was for a principled explanation in terms of those structures. From Reis’s description of the facts, however, it seems that the real cross-linguistic difference lies at the source of these structures. Sequential scope marking in German appears to be more restricted than sequential scope marking in Hindi. Though the reasons for this difference remain mysterious, they are clearly orthogonal to determining whether German subordinated structures encode direct or indirect dependency. What we need to scrutinize further is sequential scope marking in different languages to see what the locus of variation is. At this point, neither the direct nor the indirect dependency approaches can provide a clean explanation for the facts and I therefore leave the issue as an open problem for both approaches.

4.3. Considerations from Hungarian

In a recent article, Horvath (1997) has argued that the Hungarian scope marker in Spec position bears accusative case and is thus associated with CP2, which occurs in argument position. At LF, however, the scope marker is replaced by CP2 and once this configuration is obtained, wh-expressions inside CP2 are free to take matrix scope. In other words, hers is a ‘mixed’ approach of the kind discussed in section 2.3. Semantic considerations would clearly dictate reconstruction of the remnant CP2, though Horvath herself does not address this issue. If so, her account of Hungarian would fall within the indirect dependency approach at transparent LF. While I am not in a position to discuss Horvath’s claims for Hungarian, I would like to briefly review two of her arguments as they introduce new considerations into the discussion of scope marking. The goal here is a modest one, namely to lay out the facts in the languages we are concerned with in this paper and discuss how they impact on the proposals I have made for those languages.

The most striking piece of novel data discussed by Horvath has to do with the standard assumption that embedding predicates must select propositions rather than questions. The same seems to hold in Hungarian, except that the restriction is relaxed when CP2 is a multiple wh-question. This fact is illustrated most dramatically when CP2 combines a wh-expression and a yes/no particle since normally yes/no questions are not acceptable in Hungarian scope marking:

(49) a. *Mit kőrdezték hogy kivel találkoztak?
what asked-3pl that who-with met-lsg
‘With whom did they ask that I had met?’
b. *Mit gondolt János hogy átment-e Mari a vizsgán?
what thought Jenom that over-went-Q prt Mnom the exam-on
‘What did John think whether Mary passed the exam?’
c. Mit kőrdezték hogy kivel találkoztak-e?
what asked-3pl that who-with met-lsg-Q prt
‘With whom did they ask whether I had met?’

In Horvath’s account, scope marking structures require an embedded wh in the proposed CP2 to take matrix scope. (49-a) is ungrammatical because there is only one embedded wh which can either satisfy the matrix scope requirement or the selectional restrictions of the predicate. (49-b) is ungrammatical because the yes/no operator cannot be extracted, or equivalently, does not have features that can move long-distance. (49-c) is good because there is a regular wh-expression that takes matrix scope while the yes/no operator satisfies the requirements of the embedding predicate.

Note, first of all, that the Hungarian yes/no suffix -e is specially designated for embedded contexts. Thus, the unacceptability of (49-b) fits in with the proposal advanced in section 4.2 that grammaticalization of sequential scope marking prohibits the introduction of such extra elements. Turning now to the quirky behavior of question embedding predicates, consider German questions like the following:

(50) a. *Was fragt sie wen ob Maria liert?
what asks she whom whether M. loves
b. *Was fragt er wann Hans an welcher Universität studiert hat?
what asks he when H. at which university studied has

According to my information (50-a) does not have the readings Horvath claims for Hungarian. It cannot be answered with something like She asked whether Maria likes Karl, nor can (50-b) be answered with something like He asked when Hans studied at the University of Tübingen or He asked which university Hans studied at in 1996.

The same intuitions hold for Hindi and English. However, it seems to me that the relevant reading does emerge, just in case one of the wh’s in CP2 is stressed:23

23Horvath notes that the Hungarian examples are not to be interpreted as echo questions. It should be noted, of course, that the questions in (51) are not themselves echo questions and are therefore not expected to have the intonation associated with echo questions. It is only CP2 inside those questions that have this property. This point is also relevant in connection with Müller & Sternefeld’s (1996) observation that (i) with was echoed is unacceptable. In order for (i-a) to be acceptable, the previous discourse would have to contain an utterance like (i-b) where the expression corresponding to was remains inaudible. The echo question would then be a query about possible substitutions in this position. Note, however, that there are no alternatives to was in this context. Thus the situation in which (i-a) could be uttered would never arise:

(i) a. *Fritz hat Was gesagt mit wen sie gesprochen hat?
F. has what said with whom she talked has
b. Fritz hat [... ] gesagt mit wen sie gesprochen hat
propositions are understood to be accepted as given by speaker and hearer: the relevant proposition, implying thereby that he did (54-a).

(54-b), for example. This question cannot be answered by (55-b) where the government of the trace is not at issue so negation does not have its usual effect: will intervene just in case the CP is not D-linked. With have D-linked domains predicates whose complements have open-ended interpretations ence between two types of predicates with respect to negative island effects. Those nzond...English sequential questions shows that an account is needed within the indirect...section 4.1 that the negative island effect cannot be reduced to explanations in terms of syntactic movement. A semantic account, such as the one presented in Dayal (1994; 1996), is needed at least for these cases. The other is for expository purposes. As would be obvious, the two accounts make radically different predictions about scope marking and D-linking. While the semantic account of the negative island effect holds that a D-linked propositional argument of CP1 blocks semantic composition since it does not leave free the topic variable, Horvath's account suggests that D-linking is quite compatible with scope marking. In fact, the difference in predictions can also be tested without bringing negation into the picture. If the verb in CP1 of a scope marking construction like (56-a) were lexically primed to take a D-linked propositional argument and CP2 were in a syntactic configuration to move to Spec of CP1, Horvath's account would predict it to admit possible answers like (56-c). In the indirect dependency approach, on the other hand, the question-answer pair would be ruled out. This is, of course, predicted for English and Hindi and, as Horvath notes, the phenomenon cannot be tested in German:

(55) a. {I didn't confess/reveal that I cheated Bill, I didn't confess/reveal that I cheated Sue, I didn't confess/reveal that I cheated John, ...}

b. I didn't confess/reveal that I cheated Bill (but I did confess/reveal that I cheated Sue and John).

Horvath suggests that this distinction can be used to test whether a particular scope marking construction has movement of CP to Spec position. She expects this test to be generally applicable but notes that it may be unusable in German which does not allow factives. Of course, Horvath is not taking into account sequential scope marking of the kind we see in English where syntactic movement of CP2 is untenable.24 In fact, it might be said that the facts in English are orthogonal to the discussion since no predictions are made about such cases. However, I have brought in English for two reasons. One, it highlights the fact noted in section 4.1 that the negative island effect cannot be reduced to explanations in terms of syntactic movement. A semantic account, such as the one presented in Dayal (1994; 1996), is needed at least for these cases. The other is for expository purposes. As would be obvious, the two accounts make radically different predictions about scope marking and D-linking. While the semantic account of the negative island effect holds that a D-linked propositional argument of CP1 blocks semantic composition since it does not leave free the topic variable, Horvath's account suggests that D-linking is quite compatible with scope marking. In fact, the difference in predictions can also be tested without bringing negation into the picture. If the verb in CP1 of a scope marking construction like (56-a) were lexically primed to take a D-linked propositional argument and CP2 were in a syntactic configuration to move to Spec of CP1, Horvath's account would predict it to admit possible answers like (56-c). In the indirect dependency approach, on the other hand, the question-answer pair would be ruled out. This is, of course, predicted for English and Hindi and, as Horvath notes, the phenomenon cannot be tested in German:

(60) a. *What did you confess? Who did you cheat?

b. (I confessed that I cheated Bill, I confessed that I cheated Sue, I confessed that I cheated John)

c. I confessed that I cheated Bill (but not that I cheated Sue and John).

We see, then, that the new negative island facts from Hungarian do not have direct relevance for the languages under study. I have discussed them at some length in order to clarify their status and under the belief that explicating the issues may be useful in applying the diagnostic to other languages in the future.

The key properties on which Horvath bases her proposal, we see, are not replicated in the languages under consideration, so that no modification of our previous conclusions is warranted. The question remains, of course, where Hun-

24Syntactic reanalysis of the two classes into one, if available, would make it possible for syntactic movement to take place subsequent to reanalysis. Such a move is precluded by the absence of bound variable readings for pronouns in CP2 since reanalysis would also open the way for anaphoric binding.
contrary to

that its restriction is dependent on the second question for semantic dependency can be characterized as direct or indirect, it showed that either cleavage between them, is that their diverse properties make a uniform explanation unlikely. The other, given their large degree of overlap between them, is that two unrelated explanations indicate a missed generalization. This led to a fundamental distinction in the syntax of scope marking, based crucially on comparisons with sequential scope marking, explained here primarily with data from English. The key idea that was proposed is that languages universally have sequential scope marking but may differ with respect to the presence or absence of subordination, and possibly, in the levels of subordination. Though the historical perspective presented here is arguably compatible with the existence of direct dependency in scope marking, empirical evidence was presented showing that in the languages under consideration the dependency remained indirect even after subordination. The conclusion, thus, is that the locus of variation in scope marking is the syntax not the semantics.

In coming to this conclusion, the paper explicated issues regarding the syntax and semantics of scope marking. Taking transparent LF as the level at which the dependency can be characterized as direct or indirect, it showed that either dependency can be derived by a number of different syntactic options. What lies at the heart of the distinction is whether it is the scope marker as a whole that must be replaced by other semantically contentful wh-expressions before interpretation or whether its restriction is dependent on the second question for semantic content. The paper also sought to separate out phenomena that distinguish between the two approaches. These include different predictions about possible answers in the case of yes/no questions, possible complements in the case of conjoined questions, and presupposition projection properties in the context of intensional verbs. In addition, there remains the well-known fact that the direct dependency approach leaves open which lexical item will be used as a scope marker since there is no principle determining what the default in a particular language will be. In the indirect dependency approach, on the other hand, the scope marker will always be the wh-expression used to question over propositions.

This study also extended the domain of inquiry by bringing into focus the phenomenon of sequential scope marking. This led to a refinement of our present diagnostics since comparisons between sequential and subordinated structures provide a way of separating out those phenomena, such as bound variable readings, for which a structure sensitive explanation must be given from those, such as negative island effects, for which a purely semantic account cannot be ignored.

There is a further consequence of recognizing the status of sequential scope marking in the grammar that goes beyond the issue of cross-linguistic variation. It alters the paradigm for so-called long-distance wh-phenomena by showing that such effects are also available without extraction. The fact that sequences of the relevant kind, in addition to extraction structures, constitute bona fide members of the reference set has clear implications for minimalist or optimality based studies of scope marking (for example, Müller (1997)), as well as for psycholinguistic studies of wh-dependencies (for example, Thornton & Crain (1994), Abdulkarim, Roeper, & de Villiers (1997), Kluender & Münte (1998)).

Of course, many questions remain unanswered. What forces determine whether a language will shift from sequential scope marking to subordination, for example, is a question that has largely been ignored in the literature. Hopefully, though, probing the relation between scope marking structures that are attested will help future investigations into this deeper question.

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