Word Order and Scope in German*

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Abstract
This paper provides a unified account of some long-standing issues surrounding scope in German. The major question addressed is why German, in contrast to English, shows scope rigidity effects in certain constructions but not in others. The account proposed is based on the economy model suggested in Bobaljik and Wurmbrand (2008), according to which there are 'soft' economy conditions that value a particular type of correspondence between LF and PF representations. This model correctly derives the distribution of rigidity effects as a function of independent variation in the syntactic resources of various languages. Furthermore, the paper argues for the relevance of information structure in the determination of scope. Including information structure properties accounts for the lack of scope rigidity in constructions with a special intonational marking, as well as in (certain) reconstruction contexts. Lastly, the paper sheds light on the question of why reconstruction is possible in A'-, but (apparently) not A-movement contexts in German, while at the same time allowing the possibility of A-reconstruction in English.

1. Introduction

When comparing English and German, constructions in which both subject and object are quantificational noun phrases show an interesting difference. In English, sentences such as (1)a allow two interpretations, which, following standard practice, I will call *surface scope* vs. *inverse scope* interpretations. The surface scope interpretation—i.e., an interpretation that corresponds to the surface c-command relation of the quantificational elements involved—can be paraphrased as 'There is at least one student, such that that student read every novel'. Under this interpretation, the sentence will only be true if there is at least one individual who is a student and who read all novels. The inverse scope interpretation corresponds to the interpretation in which two quantificational elements are interpreted in the opposite surface c-command relation. This interpretation can be paraphrased as 'For every novel, there is at least one student who read that novel'. Under this interpretation, the sentence will be true if every novel has been read by at least one student, however in contrast to the surface scope interpretation, the students could (but do not need to) vary with the novels. German sentences such as (1)b,c on the other hand, do not allow these two interpretations in the same way English does. To be more specific, when QP arguments appear in their base-generated order and no special intonation is used (as indicated here with so-called *verum* focus on C, which is typically used to guarantee the most unmarked intonation of the rest of the sentence), only the surface scope is possible and inverse scope is unavailable. As shown in (1), scope rigidity holds for both quantifiers in the middlefield (i.e., embedded clauses), as well as in contexts where the first quantifier is in verb second position.

(1) a. *At least one student read every novel.* ∃»∀; ∀»∃

b. *WEIL mindestens ein Student jeden Roman gelesen hat*
since at.least one student every novel read has
'since at least one student read every novel'. [Krifka 1998: 77; ∃»∀; *∀»∃]

c. *Mindestens ein Student HAT jeden Roman gelesen*
At.least one student has every novel read
'At least one student read every novel'. [Krifka 1998: 77; ∃»∀; *∀»∃]

This difference between English and German has led researchers to the conclusion that German is a *scope rigid* language—i.e., a language where the scope of quantificational elements corresponds to the surface position of these elements and where no later (e.g., LF) inversion is possible (see, for instance, the standard works on German scope by Frey 1989, 1993, Lechner 1996, 1998a, 1998b, Krifka 1998).

* For useful feedback, I wish to thank Klaus Abels, Željko Bošković, Jon Gajewski, Caroline Heycock, Winnie Lechner, David Pesetsky, Mamoru Saito, William Snyder, Edwin Williams, as well as the participants in the Spring 2007 Seminar at UConn, and audiences at Nanzan University, GLOW 31 (Newcastle), and CGSW 23 (Edinburgh). This is a preliminary report of work in progress and a revised version is in progress.

As is also well-known, however, this characterization of German as a scope rigid language needs to be amended. First, inverse scope is available in German when a special intonation is used (see, among others, Jacobs 1982, 1983, 1984, 1997, Lötscher 1984, Löbner 1990, Féry 1993, Höhle 1992, Büring 1997a, 1997b). As shown in (2), when the first quantifier involves a rise intonation and the second one a fall intonation (this pattern has been referred to as *hat* or *root contour*, *I-topic, bridge,* or *topic-focus accent*), the same ambiguity as in English arises—i.e., inverse scope becomes available.[1]

(2) a. *Mindestens* /EIN *Student* *hat* \JED*en Roman* *gelesen*
At.least one student has every novel read
'At least one student read every novel'. [Krifka 1998: ∃»∀; ∀»∃]

b. *obwohl* *mindestens* /EIN *Student* \JED*en Roman* *gelesen* *hat*
although at.least one student every novel read has
'although at least one student read every novel'. ∃»∀; ∀»∃

Second, non-surface scope (i.e., reconstruction) is available in German in contexts in which overt movement has occurred. As shown in (3), when the two quantificational elements are inverted in overt syntax, both surface and inverse scope are possible even under unmarked intonation (see Frey 1989, 1993, Krifka 1998).

(3) a. *Mindestens einen Roman* *hat* *jeder Student* *gelesen*
At.least one novel has every student read
'Every student read at least one novel'. ∃»∀; ∀»∃

b. *weil* *mindestens einen Roman* *jeder Student* t_{OBJ} *gelesen* *hat*
since at.least one novel every student t_{OBJ} read has
'since every student read at least one novel' ∃»∀; ∀»∃

A common approach to the lack of inverse scope in cases such as (1)b,c is based on the claim that in languages that display scope rigidity, scope relations are determined by the configuration of quantificational elements at surface structure, rather than at a more abstract syntactic level of L(ogical) F(orm) (see Kuroda 1970, Hoji 1985, Aoun and Li 1989, 1993, Frey 1989, 1993, Lechner 1996, 1998b, Krifka 1998, among many others). Put differently, in (so-called) scope rigid languages such as German, the surface structure is considered to be the 'end' of syntax in that there are no further covert operations (at least as for as quantifier raising [QR] is concerned) that can alter the syntactic configuration to be submitted to the semantic component. This view, which I will refer to as the [-covert movement] view, immediately raises the question of how inverse scope as in (3) can be captured. The answer that has typically been given is that in a [-covert movement] language, both the overt position of the quantificational elements as well as (certain of) their traces 'count' for the computation of scope relationships. A formal implementation of this view is given as the Scope Principle in (4), which, again, is assumed to apply at surface structure.

(4) *Scope Principle* [simplified version of Frey 1989, 1993]
If α, β are operators occurring in a sentence S, then S has a reading in which α has scope over β if and only if:
a) α c-commands β, or
b) α c-commands a trace of β.

A surface scope principle such as (4) hence successfully accounts for the facts in (1)b,c and (3). What about the effect of intonation on scope in German? One of the few accounts that systematically addresses the question of how to derive the difference between (1)b,c and (2) is Krifka (1998) (see this paper for a critique of previous accounts). The essential parts of Krifka's account are summarized in (5): in constructions with no special intonation (cf. (5)a), the object stays in its base position (or at least does not move across the base position of the subject) as this would be the most economical derivation (i.e., the derivation with the fewest steps). Assuming the Scope Principle, (5)a (= (1)c) will then be unambiguous since the object does not c-command the subject or its trace. In constructions

[1] Examples involving inverse scope under special intonation are usually given as verb second clauses, however, as noted in Jacobs (1982, 1997), constructions with this intonation pattern and inverse scope are also possible, yet more restricted, in the middlefield.

with special intonation, on the other hand, both the subject and the object receive focus, which, according to Krifka, can only be assigned to XPs which are adjacent to the verb at some point in the derivation. For the subject to become adjacent to the verb, the object will hence be forced to vacate the VP as illustrated in (5)b. Although the subject undergoes further movement across the object, the object does c-command the trace of the subject in (5)b, and hence scope ambiguity will arise.

(5) a. [*one student*] has_C [t_{SUBJ} [*every novel* *read*]$_{VP}$] = (1)c

b. [*one student*]$_F$ has_C [*every novel*]$_F$ [t_{SUBJ} [t_{OBJ} *read*]$_{VP}$] = (2)a

Thus, a crucial part of the analysis is the assumption of movement of the object across the base position of the subject in (2), and the prohibition of this type of movement in (1)b,c. While the Scope Principle, together with Krifka's assumptions about movement can now be taken to cover (1)b,c, (2), and (3), one question that is still left open is the question of how an English-type flexible scope language can be distinguished from a German-type scope rigid language. Two options come to mind. First, it could be assumed that languages differ as to whether they allow or disallow covert movement. If English is a [+covert movement] language, surface scope relations could be altered by QR. Second, one could take the Scope Principle as a universal principle and relate the difference between English and German to a difference in the distribution of traces. That is, it could be assumed (see Hornstein 1995 for an account that is similar in spirit) that English allows the structure in (5)b, even in contexts without special focus assignments. Although either of these options (as well as any combinations thereof) can technically derive the contrast between English and German in (1)a vs. (1)b,c, I believe it is fair to say that, so far, no principled account has been provided in the literature that successfully predicts why the languages differ in the way they do. To provide such an explanation is therefore one of the goals of this paper.

Before outlining the approach I will pursue here, an important further set of data needs to be mentioned, as these facts will cast serious doubt on the general view that scope is determined at surface structure and that there is no covert QR in languages displaying scope rigidity effects. As has been shown in Sauerland (2001) and Sauerland and Bott (2002), when looking at coordinate constructions and inverse linking contexts, it is hard to maintain the claim that German does not allow covert quantifier movement. I will illustrate the argument for QR using inverse linking constructions—i.e., constructions in which one quantifier is contained within another quantificational noun phrase. As shown in (6), German, like English, allows inverse linking: The interpretation favored by the context in (6) is an interpretation where the universal quantifier (*every musician*) takes scope over the existential *a/one record* (as there is no single record made by all the musicians). This interpretation is easily available in German, and most importantly, does not require the special intonation necessary in other inverse scope constructions in German (this claim is substantiated by the results of the elicited production experiments conducted by Sauerland and Bott 2002).

(6) **Context**: Two friends are talking about last night. One of them had visited Peter last night, who's crazy about jazz. On that occasion, Peter played a record of Miles Davis, a record of John Coltrane, and a record of Fred Frith.

Peter	*hat eine Platte*	*jedes Musikers*	*aufgelegt*
Peter	has a/one record	every.GEN mucisian	played

'Peter played a record of every musician.' ∀»∃

Thus, assuming that inverse linking involves QR, the only conclusion that can be drawn from examples such as (6) is that English-style QR must be available in German as well. The obvious question then is why QR is available in some contexts in German (inverse linking and coordinations), but not in others (basic subject—object constructions).

In sum, an account of scope in German needs to answer the following questions: i) what is the difference between English and German in cases such as (1)a vs. (1)b,c; ii) why/how does intonation affect scope (cf. (1)b,c vs. (2)); iii) why/how does overt movement license inverse scope (cf. (1)b,c vs. (3)); and iv) why/how is inverse scope (w/o special intonation) possible in certain constructions in German (e.g., (6)), but not in others (i.e., (1)b,c)?[2] In this paper, I will present a model which will allow

[2] This paper will only be concerned with the question of whether inverse scope relations are possible *in principle* in a particular syntactic configuration and language. As is well-known, inverse scope as in (2) and (3) also depends on the type of quantifier involved (see Lechner 1996, 1998a, 1998b, Pafel 2005) and certain pragmatic factors (see Büring 1997a, 1997b, 2003). The system to be presented in this paper is intended to describe the upper bounds of what is possible in any configuration/language—additional language specific restrictions as suggested in the works

us to answer all of these questions in a uniform and explanatory way. The article is organized as follows: Section 2 lays out the basic system—the economy based model developed in Bobaljik and Wurmbrand (2008), which will provide an answer to questions i) and iv). Section 3 provides motivation for the general system and introduces some of the assumptions needed to account for scope in German. Section 4 returns to German scope and provides answers for questions ii) and iii). And section 5 concludes the paper.

2. ScoT—the basic idea

The account of scope in German to be presented in this paper is built on the theory developed in Bobaljik and Wurmbrand (2008) (henceforth B&W). The major claim argued for in B&W is that UG includes an economy condition which favors isomorphism between LF (scope) and PF (linear order) representations. This condition, dubbed *ScoT* (for Scope Transparency), is stated in (7). The symbol » is used to represent the canonical manifestation of hierarchical order at the relevant level: roughly scope and information structure (see below) at LF, and linear precedence at PF.

(7) *Scope Transparency* (ScoT):
If the order of two elements at LF is A»B, the order at PF is A»B.

While the basic idea underlying ScoT is not new (see, for instance, Pesetsky's 1989 *Earliness Principle*, Diesing's 1997 *Scope Principle*, Bobaljik's 1995, 2002 *Minimize PF:LF Mismatch,* Müller's 2000, 2002 *Shape conservation*, and the general frameworks of Williams 2003, Reinhart 2005, Broekhuis 2008), B&W's proposal departs crucially from previous accounts in the way in which the condition is implemented theoretically. One of the most significant differences, which will also be crucial for the discussion to follow, is the assumption, encoded in (7), that the principle is asymmetric, regulating the choice among PFs for any given LF (i.e., ScoT requires the PF to reflect LF, but not vice versa). Furthermore, ScoT is taken to be universal and not a matter of parametric variation. Language variation, in this view, arises due to the violable ("soft") nature of economy conditions—ScoT must be satisfied whenever possible, but may be overridden by other constraints. It is variation in the inventory of other constraints among languages, in the best case, independently detectable, that yields variation in the distribution of scope rigidity effects. In other words, the appearance of scope rigidity is the "most economical" state of affairs, but scope rigidity effects will or will not emerge in specific configurations in particular languages as a function of the general syntactic resources of each language.

To illustrate the basic workings of ScoT, let us return to the paradigm scope rigidity contrast between English and German (the crucial examples are repeated here as (8)a vs. (8)b). Throughout this article, the relevant scope-bearing elements (e.g., the quantified DPs in (8)), will be annotated as "A" and "B", where A c-commands B in the base order. As will become important momentarily, (8)c shows that the inverted basic order—i.e., B»A— is also possible in German, due to the availability of scrambling.

(8) a. *At least one student* (A) *read every novel* (B). ∃»∀; ∀»∃

b. *WEIL mindestens ein Student jeden Roman gelesen hat*
since at.least one student (A) every novel (B) read has
'since at least one student read every novel'. ∃»∀; *∀»∃

c. *WEIL jeden Roman mindestens ein Student gelesen hat*
since every novel (B) at.least one student (A) read has
'since at least one student read every novel'. ∀»∃

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above will be necessary to determine whether any particular combination of quantifiers allows inverse scope or not.

Tables 1 and 2 illustrate the account provided in B&W.[3] Let us begin with German. In the simplest case (first row of Table 1), the scope relation A»B reflects the base order among the elements (also A»B). Since the PF order directly mirrors the LF order, ScoT is respected in this case. (The marks in the second column represent the relevant judgments, those under the column 'ScoT' represent satisfaction/violation of the economy condition). The second row of Table 1 illustrates a derivation with QR. Recall that it is assumed here that QR is available in principle in German (there is no [±QR] parameter), and thus a syntactic derivation resulting in the constellation in row two of Table 1 is a convergent syntactic derivation in German and hence must be considered. Since, in this derivation, LF (B»A) and PF (A»B) do not match, ScoT is violated. This violation of ScoT will then be the reason why inverse scope is impossible in German in examples such as (8)b. Lastly, in row three, which corresponds to the scrambling example in (8)c, the same LF (B»A) is isomorphic to the PF (also B»A), and hence in this case, ScoT is satisfied.

Having shown how ScoT enforces scope rigidity, let us turn now to English. As in German, ScoT is respected in the surface scope order in (8)a (row one in Table 2), and violated in the inverse scope order (line two in Table 2). Why then is inverse scope nevertheless possible in English? To answer this, it is essential to call to mind the nature of economy constraints. Economy constraints are soft constraints that do not necessarily lead to ungrammaticality. Rather an economy constraint such as ScoT determines which candidate (in our case, which derivation) is *the best option* regarding the criteria imposed by the constraint. If, in a particular situation, there is only one possible derivation (i.e., there is no competitor), that derivation will automatically be the best option, irrespective of whether it satisfies or violates any economy constraint. This is, B&W argue, at the core of the difference between English and German. In German, ScoT compares the derivation in row two (QR) with the derivation in row three (overt scrambling) of Table 1. Since one of these derivations satisfies ScoT and the other violates it, ScoT will come into effect and exclude the ScoT violating derivation—hence QR will be blocked. In English, on the other hand, scrambling is not available for independent reasons, and hence, the QR derivation in row two will have no competitor and hence will automatically be licensed. In other words, in English, inverse scope as in row two of Table 2 will be available despite the fact that this derivation constitutes a ScoT violation, exactly because there is no way to represent inverse scope transparently in the syntax.[4]

T 1:	German	LF	PF	ScoT
(8)b	✓	A»B	A»B	✓
(8)b	* (QR)	B»A	A»B	*
(8)c	✓	B»A	B»A	✓

T 2:	English	LF	PF	ScoT
(8)a	✓	A»B	A»B	✓
(8)a	✓ (QR)	B»A	A»B	*
	Not possible	B»A	B»A	✓

This system has two important consequences. First, it predicts (all else being equal) a bi-conditional relation between free word order and scope: free word order entails rigid scope, and rigid word order entails flexible scope. This is essentially the answer to question i) raised in the introduction: the difference regarding the availability of inverse scope between English and German is a by-product of the syntactic resources of the languages—German allows scrambling, while English doesn't. Second,

[3] Note that tables are used in the B&W system as a convenient means of representing constraint interaction and the computation that evaluates competing representations/derivations. There is no commitment to a theoretical framework such as Optimality Theory (OT). In particular, the B&W system does not invoke alternative rankings of constraints as a theory of language variation, nor is there a commitment to the relevance of all constraints in all languages, the absence of hard constraints, or any of various other tenets of OT. The results are intended to be compatible with the *Economy* framework (Chomsky 1991 et seq), where what is sufficient is the postulation of violable conditions, that may, in principle, come into conflict with one another.

[4] Two qualifying remarks are necessary at this point. First, it is crucial that in English, sentences such as (8)a do not compete with their passive counterparts or with topicalization structures. B&W suggest that in passive, the difference in numeration is relevant for restricting the reference set. As for topicalization, we will see below that in the B&W system, information structure (topic, focus) is considered to be part of LF in the relevant sense, and thus topicalization structures have a different LF than counterparts without topicalization, hence they will not compete with each other. Second, although the lack of scrambling in English is essentially taken to be the main reason for why inverse scope is possible in that language, it is important to stress at this point that the system does not predict that inverse scope is possible whenever overt movement is impossible. ScoT is an economy condition regulating choices among *convergent* derivations. As such, ScoT rules out (syntactically well-formed) QR in certain constructions (i.e., when there is a more economical alternative) but does not 'rule in' non-convergent derivations; that is, standard locality conditions on QR still hold and will eliminate certain configurations before ScoT even comes into play.

the ScoT system predicts that scope rigidity is not a property of languages, but rather a property of certain configurations. This provides us with the answer to question iv) raised in the introduction, namely the question of why inverse scope is possible in certain contexts in German, for instance, in the inverse linking case repeated here as (9)a. As shown in (9)b, in these contexts, overt movement of the genitive DP is impossible (I do not have a specific account of this fact, but simply assume here that overt movement of genitive DPs is blocked, perhaps, for Case reasons in German).

(9) a. *Peter* *hat eine Platte* *jedes Musikers* *aufgelegt* =(6)
Peter has a/one record (A) every.GEN mucisian (B) played
'Peter played a record of every musician.' ∃»∀; ∀»∃

b. **Peter* *hat* *jedes Musikers* *eine Platte* *aufgelegt*
Peter has every.GEN mucisian (B) a/one record (A) played

Given that overt movement is impossible in these contexts, inverse linking in genitive constructions is possible in German in exactly the same way it is in English. This is illustrated in Table 3: despite violating ScoT, a QR derivation will not be excluded by ScoT, simply because there is no alternative that satisfies that constraint.

T 3: Inverse linking—GEN		LF	PF	ScoT
(9)a	✓ (QR)	B»A	A»B	*
(9)b	* (Not possible)	B»A	B»A	✓

This analysis, and the ScoT model in general, is further supported by a second type of inverse linking construction, namely the prepositional construction in (10)a (i.e., a construction where the complement of the noun is realized as a prepositional phrase). As noted in Sauerland and Bott (2002), (10)a differs from the genitive construction in (9)a, however, in that inverse scope is only possible when special intonational marking is used. This difference, although rather unexpected in traditional QR-accounts, follows straightforwardly from the system developed here, once we take into account the overt movement potential of these constructions. As shown in (10)b, the prepositional construction differs sharply from the genitive construction in whether the nominal complement can undergo overt movement: while overt movement of a genitive complement is excluded (cf. (9)b), overt movement of a PP complement is perfectly acceptable ((10)b).

(10) a. *Peter* *hat* *eine Platte* *von jedem Musiker* *aufgelegt*
Peter has a/one record (A) of every mucisian (B) played
'Peter played a record of every musician.' ∀»∃ only with special intonation

b. *Peter* *hat* *von jedem Musiker* *eine Platte* *aufgelegt*
Peter has of every mucisian (B) a/one record (A) played
'Peter played a record of every musician.'

Given the difference between (9)b and (10)b (i.e., the availability vs. unavailability of the B»A order), the ScoT model predicts without further ado that these two constructions will differ in their scope potential. As shown in Table 3, the genitive construction allows inverse scope freely since there is no way to represent inverse scope transparently—i.e., there is no competitor for (9)a. The prepositional construction, on the other hand, is predicted to not allow inverse scope under neutral intonation exactly for the same reason (8)b prohibits inverse scope—the existence of a ScoT satisfying competitor ((10)b in case of the prepositional inverse linking construction), which will render the ScoT violation arising in (10)a under inverse scope a fatal violation. Furthermore, in both (8)b and (10)a inverse scope becomes available, once the special intonation is used, which will be discussed in section 4.1.

Before turning to the account of the remaining two questions about German scope raised earlier—the effect of intonation on scope and the possibility of reconstruction—it is necessary to introduce some further background and motivation for the ScoT system. In the next section, I will summarize two of the phenomena discussed in B&W as these provide motivation for assumptions to be used in the account of the German facts. To do so, the notion of LF will be broadened to encompass not only scope relations but also information structure relations such as *topic* and *focus*. At that point, ScoT will become somewhat of a misnomer (since these notions are not about scope), but, following B&W, I will continue to use the term to stress the uniform nature of the relevant economy condition.

3. ScoT—background

3.1 The ¾ signature

One of the major pieces of motivation for ScoT as an economy condition is what B&W refer to as the ¾ signature. B&W present a collection of phenomena which share the property that, given two LF choices and two PF choices, three of the four logical combinations are judged acceptable. We argue that this is precisely what is expected if ScoT is a soft constraint that interacts with other economy conditions. A schematic illustration of the ¾ signature is given in Table 4. As above, A and B stand for two relevant elements, where the base order is A»B, and the second column represents the actual (reported) judgments. The columns "LF" and "PF" give the four logical PF-LF combinations, which are evaluated by ScoT in the same fashion as above. The last column headed by *Move represents a second economy constraint, specifically, a constraint that renders overt movement costly—i.e., a constraint that privileges the A»B order at PF (cf. the idea of movement as a Last Resort in Chomsky's version of Minimalism). Finally, Table 4 is organized into two subparts (setting apart rows a. and b. from rows c. and d.), which reflects B&W's assumption that ScoT is asymmetric in that the system picks one LF and then chooses the best PF for that LF according to the outcome of the economy constraints. In other words, only derivations with the same LF are compared, which will have the effect that the derivations in rows a. and b. are evaluated separately from the derivations in rows c. and d.

T 4		LF	PF	ScoT	*Move
a.	✓	A»B	A»B	✓	✓
b.	*	A»B	B»A	*	*
c.	✓	B»A	B»A	✓	*
d.	✓	B»A	A»B	*	✓

Armed with this LF-first system and the two economy constraints as defined above, the ¾ signature then follows. One LF (A»B) can only find phonological expression in one way, namely A»B, since, as shown in rows a. and b., the PF A»B satisfies both economy constraints, whereas the PF B»A violates both constraints, thus making a. a clear winner. The LF B»A, on the other hand, can be expressed by either of two PF representations, since no PF will simultaneously meet both conditions. ScoT can be satisfied at the expense of *MOVE, or overt movement can be avoided at the expense of requiring QR. By violating one economy constraint each, none of the PFs come out as 'better' than the other, and hence the economy system will allow both derivations.

In sum, the ¾ signature phenomena discussed in B&W all show that if LF—PF isomorphism can be respected this has to be done (derivations a. vs. b. in Table 4). If, however, respecting isomorphism violates another economy constraint (derivation c.), violating ScoT becomes possible (derivation d.). As argued in B&W, this pattern receives a straightforward account in the LF-first economy system and allows a unification of a range of seemingly disparate phenomena. In what follows, I will replicate two of B&W's ¾ signature effects which will be of immediate relevance to the discussion of German scope. For further evidence and motivation, the reader is referred to the original paper.

3.2 English focus and HNPS (Williams 2003)

One ¾ signature is exemplified by the interaction of Heavy NP Shift (HNPS) and focus in English, in particular, the paradigm in (11) presented in Williams (2003:34). What is of particular interest here is that there are two variables to consider: in terms of overt order, the DP object may either precede or follow the PP, and in terms of information structure, either the DP or the PP may be (or include) the focus. Of the four possibilities, exactly three are acceptable.

(11) a. John gave to Mary all of the money in the SATCHEL. HNPS
b. *John gave to MARY all of the money in the satchel. *HNPS
c. John gave all of the money in the satchel to MARY. no HNPS
d. John gave all of the money in the SATCHEL to Mary. no HNPS

As Williams notes, one account that can be immediately set aside would be an account treating HNPS as an obligatory operation placing focus in final position. The pair (11)a vs. (11)d shows that, with focus held constant, HNPS is optional; the constituent containing the focus need not be final, and thus (11)b

cannot be excluded simply because focus is non-final. Williams argues that there is indeed a desideratum in English that focus be final, but that this is not an absolute requirement. HNPS may apply, altering the canonical order (DP»PP), but only when application of HNPS yields a better focus representation. In Williams's theory, there are various levels of representation, among which are a level of focus structure (FS) in which the focus should be at the right periphery (in English), and a level of Case Structure (CS) in which a DP argument should precede PPs within the VP. The comparison of (11)a and (11)d shows an inherent tension: when the DP argument contains the focus, it is impossible for surface structure to be faithful to both FS and CS simultaneously, and optionality emerges. On the other hand, (11)b is faithful to neither FS nor CS, and this order, with focus as indicated, is excluded.

As B&W show, Williams's account finds a straightforward translation into the ScoT framework, if the notion of LF is broadened to include a representation of (topic and) focus, indicated here as LF_{IS} (for Information Structure). Once we return to German, I will show how the representations for scope and information structure are related to one another. Furthermore, following Williams, B&W assume that one aspect of (English) LF_{IS} is the relation X»FOC (i.e., focus is always final at LF_{IS}). This assumption has the effect that the examples in (11) are grouped as in Table 5—i.e., there are two pair-wise competitions ((11)b,c and (11)a,d), taking a particular $LF_{(IS)}$ as input, and regulating the choice among competing PFs, relative to two economy conditions (recall that the ScoT system starts with the LF and then chooses the best PF for that LF). Lastly, B&W appeal to the economy condition introduced above, namely *MOVE. HNPS is thus a "free" movement—it is not feature-driven or required for convergence—but it is costly, as it violates this economy condition. Table 5 then shows how Williams's intuition is recast as a ¾ signature: where the conditions align, there is a winner ((11)c) and a loser ((11)b), but where the conditions conflict, optionality emerges ((11)a,d).

T 5: English HNPS & focus		LF_{IS}	PF	ScoT	*Move
(11)c	✓	NP » PP [FOC]	NP » PP [FOC]	✓	✓
(11)b	* (HNPS)	NP » PP [FOC]	PP [FOC] »NP	*	*
(11)a	✓ (HNPS)	PP » NP [FOC]	PP » NP [FOC]	✓	*
(11)d	✓	PP » NP [FOC]	NP [FOC] » PP	*	✓

3.3 Dutch A'-Scrambling (Neeleman and van de Koot 2008)

The second ¾ signature which will be of direct relevance to German scope is based on findings about A'-scrambling in Dutch presented in Neeleman and van de Koot 2008 (henceforth NvdK). NvdK argue that a particular sense of topic and focus is important to an understanding of word order variation in Dutch. For focus, it will suffice for present concerns to take the focus in a question-answer pair to be the constituent in the answer that corresponds to the *wh*-operator in the question. The notion of topic suggested in NvdK is narrower than often used in the literature. In particular, simple givenness (old information) is not sufficient for a DP to count as a topic; a DP counts as a topic only if it either narrows or otherwise changes the current discourse topic. One context that makes this usage clear is in question-answer pairs where the responding party answers a different question than the one posed, thereby shifting the topic in the process (see Büring 1997a, 1997b, 2003).[5]

Based on these definitions, consider the examples in (12) and (13). As shown in (12), in a context where the subject is set up as the topic and the object as the focus, only the order topic»focus is possible, and movement (scrambling) of the object across the subject is blocked. If, on the other hand, the subject is the focus and the object is the topic, as in (13), both orders topic»focus as well as focus»topic are possible. That is, in this case movement of the object across the subject is possible, but not obligatory.

(12) *Hoe zit het met FRED? Wat heeft HIJ gegeten?* *Nou, dat weet ik niet, maar…*
'What about Fred? What did he eat?' 'Well, I don't know, but…'

a. *ik geloof dat [Wim]$_T$[van de BONEN]$_F$ gegeten heeft*
I believe that Wim from the beans eaten has
'I believe that Bill has eaten from the beans.' TOP»FOC

[5] As B&W note there is some controversy regarding NvdK's use of the terminology of topic and focus. While B&W and the paper here continue to use topic and focus in NvdK's terms, this is not crucial for the system and a different terminology would not affect the analysis.

b. *#ik geloof dat [van de BONEN]$_F$ [Wim]$_T$ t$_F$ gegeten heeft*
I believe that from the beans Wim t eaten has *FOC»TOP»t$_{FOC}$

(13) *Hoe zit het met de SOEP? Wie heeft DIE gegeten? Nou, dat weet ik niet, maar…*
'What about the soup? Who ate that?' 'Well, I don't know, but…'

a. *ik geloof dat [WIM]$_F$ [van de bonen]$_T$ gegeten heeft*
I believe that Wim from the beans eaten has
'I believe that Bill has eaten from the beans.' FOC»TOP

b. *ik geloof dat [van de bonen]$_T$ [WIM]$_F$ t$_T$ gegeten heeft*
I believe that from the beans Wim t eaten has
'I believe that Bill has eaten from the beans.' TOP»FOC»t$_{TOP}$

The acceptability of (13)a shows that the ungrammaticality of (12)b cannot simply be accounted for by a requirement that a topic precede the focus, as the focus»topic order is in principle possible. Rather, the generalization according to NvdK is that movement of a focus across a topic is impossible, whereas movement of a topic across a focus is possible.

NvdK propose the following account. They assume that information structure representations are hierarchical, with the sister of a focus interpreted as a background (relative to that focus), and the complement of a topic interpreted as its comment. This is shown in (14)a. NvdK claim moreover that focus-background structures can be part of a comment, but topic-comment structures cannot be embedded in a background, hence the representation in (14)b is ill-formed.

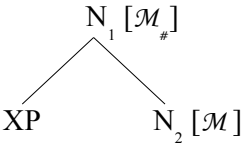
(14) Information structure.

a. topic [$_{COMMENT}$ FOCUS [$_{BACKGROUND}$ …]]

b. ***FOCUS [$_{BACKGROUND}$ topic [$_{COMMENT}$ …]]**

NvdK next propose a pair of mapping rules, that interpret A'-movement structures. With reference to the structure in (15)a, the two rules are given in (15b)-c. Note that a crucial assumption in the NvdK account is that the mapping rules in (15) only apply to movement structures.

(15) a.



b. *Comment Mapping Rule*: If XP in a. is interpreted as topic, then interpret N_2 as comment.
c. *Background Mapping Rule*: If XP in a. is interpreted as focus, then interpret N_2 as background.

The facts are then accounted for as follows. In (12)b, the moved object is interpreted as a focus, and thus the mapping rule in (15)c applies, mapping the sister of the object to the background. However, this background then contains a (contrastive) topic, and hence, the resulting configuration will be as in (14)b, which is illicit. In (13)b, on the other hand, the same word order is possible, since the moved object is interpreted as a (contrastive) topic, and thus the mapping rule (15)b applies, which will yield the configuration in (14)a, which is allowed. Lastly, (13)a does not run into the same problem as (12)b, despite the fact that both examples involve the order focus»topic, since, by stipulation, the mapping rules in (15) only apply to the output of A'-movement. According to NvdK, when there has been no movement, mapping is "free". One important question this account thus faces is the question of why the mapping only applies to structures generated by movement.

The account provided in B&W gets around this problem. As the reader will have suspected by now, the pattern in (12) and (13) constitutes another ¾ signature. The derivations and economy constraint evaluations, which are entirely parallel to the English HNPS discussion above, are given in Table 6. The relevant LF notion here is again Information Structure, for which B&W adopt (14), stated as TOP»FOC. Assuming this LF$_{IS}$, the examples in (12) and (13) are then grouped as indicated in the table. As the reader can verify, the generalization is again that the interaction of the economy

constraints ScoT and *Move allows movement only when it provides a better reflection of some aspect of interpretation than the sentence would without movement. In the cases at hand, just as with the "satchel" examples discussed above, the topic-focus structure may or may not align with the canonical order. When the two are mis-aligned, movement provides a better reflection of the topic-focus relations, but the trade-off is a non-canonical, and thus costly, word order. Under this approach, such a trade-off generally results in the appearance of optionality. But in the case of (12b), movement is unmotivated, and hence disallowed.

T 6: Dutch		LF_{IS}	PF	ScoT	*Move
(12)a	✓	A [TOP] » B [FOC]	A [TOP] » B [FOC]	✓	✓
(12)b	* (A'-scrambling)	A [TOP] » B [FOC]	B [FOC] » A [TOP]	*	*
(13)a	✓	B [TOP] » A [FOC]	A [FOC] » B [TOP]	*	✓
(13)b	✓ (A'-scrambling)	B [TOP] » A [FOC]	B [TOP] » A [FOC]	✓	*

To sum up, the crucial claims of the B&W system are: i) there exist (soft) economy conditions that value a particular type of correspondence between LF and PF representations; ii) 'LF' covers both scope relations as well as information structure properties; iii) the economy constraints are uni-directional: LF (broadly construed) is calculated first, and determines PF; iv) the reference set for the competition includes only convergent derivations with the same information structure properties (FOC final in English, TOP»FOC in Dutch, potentially universal).

So far, thus, ScoT has been used in two different, but related ways. On the one hand, ScoT has been used to value isomorphism between linear order and LF qua quantifier scope, and on the other hand, ScoT has been taken to enforce transparency with respect to LF qua information structure. The important question to ask, then, is whether there are really two isomorphism conditions (compare Williams 2003, whose theory has a variety of isomorphism conditions relating seven or so discrete levels of representation). Of obvious relevance is the interaction between quantifier scope and information structure, when both are at issue in the same sentences. To address this issue, I will now return to German and tackle the two remaining questions raised in the introduction about German scope.

4. Back to German

4.1 Scope and intonation

In this section, I will return to the question why scope rigidity disappears under a certain intonation pattern in German. Let us first recall where the analysis stands. Under neutral intonation, examples such as (16)a show scope rigidity in German. I have argued in section 2, that the reason for the lack of inverse scope in this case is ScoT—ScoT will disfavor the QR derivation in (16)a, since an alternative PF is available, namely (16)b, which will be isomorphic to the intended scope relation B»A (as discussed in section 2, the same pattern is found in prepositional inverse linking constructions).

(16) a. *WEIL mindestens ein Student jeden Roman gelesen hat* =(1)b/(8)b
since at.least one student (A) every novel (B) read has
'since at least one student read every novel'. [Krifka 1998: 77; ∃»∀; *∀»∃]

b. *weil jeden Roman mindestens ein Student gelesen hat*
since every novel (B) at.least one student (A) read has
'since at least one student read every novel'. ∀»∃

Importantly, as pointed out in the introduction, scope rigidity disappears under a rise-fall intonation (see (17)a).[6] These facts raise the following questions: Why/how does intonation change the scope properties, and more specifically for the current account, why does the existence of (17)b not block inverse scope in (17)a.

[6] There is some debate about what exactly that intonation is. Following Krifka (1998), I will continue to refer to this intonation pattern as rise-fall contour (but see Jacobs 1997, Sauerland and Bott 2002 for qualifications).

(17) a. *Mindestens* /EIN *Student* *hat* \JED*en Roman* *gelesen* =(2)a
At.least one student has every novel read
'At least one student read every novel.' [Krifka 1998: ∃»∀; ∀»∃]

b. *Jeden Roman* *hat* *mindestens ein Student* *gelesen*
every novel (B) has at.least one student (A) read
'At least one student read every novel.' ∀»∃

Although authors differ in some of the specifics of the terminology they use, there is fairly robust agreement in the literature that the special rise-fall intonation signals a special information structure, which (roughly) corresponds to (contrastive) topic (rise) and focus (fall) (see Büring 1997a, 1997b, Krifka 1998). Once this information structure property is added to the picture, the system outlined above allows us to provide a straightforward account of the long-standing puzzle of the interaction of intonation and scope. Following the standard claim that the information structure of (17)a is A_{NOM}[TOP] » B_{ACC} [FOC], (17)b will only be a competitor when it has the same LF/information structure—i.e., when A is a topic and B the focus (recall that ScoT determines the best PF for one particular LF, where LF comprises of scope and information structure). The relevant derivations are given in Table 7. Looking at this table, we are now also able to answer the question of how LF and information structure interact with ScoT. Since, in contexts such as (17)a under a derivation with QR, the scope relation (B»A) is the opposite of the information structure (A»B), there will be no PF that is isomorphic to both representations. Either, the PF will match scope ((17)b) or it will match the information structure ((17)a), but a fully isomorphic relation cannot be achieved. Given that both (17)a and (17)b are well-formed in German under the B»A interpretation, we can conclude that both representations are relevant for ScoT—i.e., ScoT picks the PF that is the best match for both LF (scope) and information structure. In a situation where scope and information structure do not match, two PFs will be possible, even in languages/constructions that otherwise show rigidity effects.[7]

T 7: Special intonation		LF	IS	PF	ScoT
(17)a	✓ (QR)	B»A	A [TOP] » B [FOC]	A [TOP] » B [FOC]	* [LF]
(17)b	✓	B»A	A [TOP] » B [FOC]	B [FOC] » A [TOP]	* [IS]

An important feature of the account suggested here is thus that the question of whether inverse scope is possible in a particular configuration cannot simply be answered by looking at a sentence in isolation (see also Williams 2003). Since the evaluation metric adopted from B&W only applies to same LF/IS combinations, it is crucial to keep the information structure constant when evaluating scope. This means that there are four LF/IS/PF combinations relevant for the question of whether QR is possible in German, which are summarized in Table 8 (the remaining LF/IS/PF combinations are postponed until section 4.2.3, as they involve reconstruction, which, as we will see, requires a slightly different set up of the data).

T 8: QR		LF	IS	PF	ScoT
(17)a, (18)b	✓ (QR	B»A	A [TOP] » B [FOC]	A [TOP] » B [FOC]	* [LF]
(18)a	✓	B»A	A [TOP] » B [FOC]	B [FOC] » A [TOP]	* [IS]
(19)b	* (QR)	B»A	B [TOP] » A [FOC]	A [FOC] » B [TOP]	* [LF, IS]
(19)a	✓	B»A	B [TOP] » A [FOC]	B [TOP] » A [FOC]	✓

Table 8 outlines the predictions the ScoT system makes. Some of the judgments are rather subtle since it is fairly easy to adjust the context to achieve the information structure needed to license QR (see also Neeleman and van de Koot 2008 for a discussion of the methodological hurdle of this topic-focus swap). Nevertheless, it appears to me that the contrast predicted in Table 8 is detectable in (18) vs. (19). That is, if the subject is interpreted as the focus and the object as a topic, a derivation with QR is clearly disfavored as a means to express inverse scope (cf. (19)b). This sentence only allows inverse scope in the context in (19) if the information structure is adjusted roughly to "I don't know the answer

[7] Note that *Move cannot be assumed to be in effect in German; if there was such a constraint, QR would be licensed in cases *without* special intonation and not in cases *with* special intonation. At this point, I do not have an explanation for when this constraint is active and when it isn't. Further cross-linguistic investigation is necessary to derive the distribution of *Move.

to your question, but if we are speaking of pupils…", i.e., when the subject (A) is turned into a topic. Needless to say that further research is necessary to find ways to avoid this interfering factor.

(18) *Jetzt zu den Studenten. Was hat mindestens ein Student gelesen? Das weiß ich nicht, aber…*
Let's talk about the students. What did at least one student read? I don't know, but…
A [TOP]; B [FOC]
Intended scope: B»A

a. *jeden Roman hat mindestens ein Schüler gelesen*
every novel (B) has at least one pupil (A) read
'at least one pupil read every novel' ∀»∃

b. *mindestens ein Schüler hat jeden Roman gelesen*
at.least one pupil (A) has every novel (B) read
'at least one pupil read every novel' ∀»∃, ∃»∀

(19) *Jetzt zu den Gedichten? Wer hat jedes Gedicht gelesen? Das weiß ich nicht, aber…*
Let's talk about the poems? Who read every poem? I don't know, but…
A [FOC]; B [TOP]
Intended scope: B»A

a. *jeden Roman hat mindestens ein Schüler gelesen*
every novel (B) has at least one pupil (A) read
'at least one pupil read every novel' ∀»∃

b. *mindestens ein Schüler hat jeden Roman gelesen*
at.least one pupil (A) has every novel (B) read
'at least one pupil read every novel' #∀»∃, ∃»∀

In sum, although some of the predictions still await further empirical confirmation, the ScoT system has provided us with an answer to the question of why intonation interacts with scope in the way it does. While ScoT typically rules out derivations with QR in German due to the existence of a ScoT matching derivation involving overt movement, the advantage of the overt movement derivation disappears in contexts with a rise-fall intonation. In that situation, an overt movement derivation, while a better PF match when compared to LF, is a worse PF match when compared to information structure. Since both derivations (overt movement and QR) fare equally regarding ScoT, hence both are licensed.

4.2 Reconstruction

4.2.1 The puzzle

The final issue about scope in German to be addressed in this paper concerns examples such as (20)—that is constructions in which overt movement has applied. The common claim (see Frey 1989, 1993, Lechner 1996, 1998a, 1998b, Krifka 1998 among others) is that examples of the form Q_1—Q_2—t_{Q1} are ambiguous and do not require special intonation for the inverse scope relation (recall that by 'inverse' scope, I refer to the opposite surface c-command relation of the two quantificational elements).

(20) *weil mindestens einen Roman jeder Student* t_{OBJ} *gelesen hat* =(3)b
since at.least one novel (B) every student (A) t_{OBJ} read has
'since every student has read a novel' ∃»∀; ∀»∃

The possibility of inverse scope raises the following question for the ScoT model presented here. Given that the lack of QR in German is attributed to a ScoT violation (see row b. in Table 9), reconstruction as represented in row d. should also be excluded, since there is a competing derivation—a structure without overt movement (row c.)—which satisfies ScoT. The question therefore is why reconstruction as in (20) does not create a (fatal) ScoT violation.[8]

[8] Note that the answer here cannot be attributed to a *Move constraint since this would have exactly the opposite effect—it would rule in QR and rule out reconstruction. Therefore, this constraint cannot be active in German.

T 9: Reconstruction problem		LF	PF	ScoT
a.	✓	B»A	B»A	✓
b.	* (QR)	B»A	A»B	*
c.	✓	A»B	A»B	✓
d.	✓ (Reconstruction)	A»B	B»A	*

In what follows I will argue that the answer to this puzzle involves two parts. First, I will summarize arguments from the literature (most notably Lechner 1996, 1998a, 1998b) showing that syntactic reconstruction is indeed impossible in certain types of movement constructions in German and that the configuration as in row. d in Table 9 is indeed ruled out, exactly as predicted by ScoT. Second, I will argue that cases which do allow syntactic reconstruction involve particular information structure properties, which have the precisely same effect as special intonation in the context of QR. That is, the information structure configuration will be shown to be in conflict with the scope structure, which will make it impossible for the PF to match both representations, and hence the derivations in rows c. and d. will tie regarding ScoT and reconstruction will be licensed.

4.2.2 Properties of reconstruction

Let me begin with a quick summary of some standard claims made in the literature on reconstruction in scrambling languages. A wide-spread assumption in the scrambling literature is that only A'-movement reconstructs, whereas A-movement does not reconstruct (see Saito 1989, 2003, Mahajan 1990, Tada 1993, Nemoto 1993, Lasnik 1999 among many others). Examples illustrating the difference between the two types of movement in German and Japanese are given in (21) and (22), respectively. As shown in these examples, a moved anaphor or an anaphor embedded in a moved argument can be bound by the 'moved across' argument only when movement targets a position to the left of the subject, but not when movement is to the right of the subject. A common assumption therefore is that the former type of movement (often referred to as IP or medium scrambling) is or can be A'-movement, whereas the latter (VP or short scrambling) can only be A-movement.

(21) a. **weil der Peter einige Freunde von einander$_i$ den Gästen$_i$ t_{ACC} vorgestellt hat*
since the Peter some.ACC friends of each other the.DAT guests t_{ACC} introduced has
'since Peter introduced some friends of each other to the guests' [Lechner 1998b:298]

b. *weil dieses Bild von sich$_i$ der Hans$_i$ seinen Freunden t_{ACC} schenken wollte*
since this picture of himself the John his friends t_{ACC} give wanted
'since John wanted to give this picture of himself to his friends as a gift'
[Lechner 1998b: 297]

(22) a. **Taroo-ga otagai-o$_i$ [Mari-to Hanako]$_i$-ni t_{ACC} syookaisita*
Taro-NOM each other-ACC Mari-and Hanako-DAT t_{ACC} introduced
'lit. Taro introduced each other to Mari and Hanako.' [Yamashita To appear]

b. *Otagai-o$_i$ [Taroo-to Itiroo]$_i$-ga Mari-ni t_{ACC} syookaisita*
each other-ACC Taro-and Ichiro-NOM Mari-DAT t_{ACC} introduced
'Taro and Ichiro introduced each other to Mari.' [Yamashita To appear]

These contrasts raise an interesting question, namely why A- and A'-movement are different in terms of reconstruction in these languages. The lack of A-reconstruction becomes particularly puzzling when one compares this form of A-movement in scrambling languages with A-movement in a non-scrambling language like English. As has been shown in numerous works (see Fox 1999, 2000, 2003, Wurmbrand and Bobaljik 1999), A-reconstruction is readily available in English, and hence the claim that A-movement does not reconstruct would need to be qualified. I will return to a comparison between A-movement in German/Japanese and A-movement in English in section 4.2.4. At this point, I would like to mention another, more serious, problem for the traditional view that A-movement does not reconstruct. As has been pointed out already in Hoji (1985) for Japanese, A-movement *does* show reconstruction effects for scope—a fact, that is typically ignored in many discussions of reconstruction. An example is given in (23), which involves short scrambling, yet scope ambiguity.

(23) *Taroo-ga huta-ri-no otoko-o san-nin-no onna-ni* t_{ACC} *syookaisita*
Taro-NOM 2-CL-GEN men-ACC 3-CL-GEN women-DAT t_{ACC} introduced
'Taro introduced two men to three women.' [Hoji 1985: 2»3/3»2]

As for German, the mismatch between scope and binding in A-movement contexts is most strikingly illustrated in the following examples from Lechner (see Lechner 1996, 1998a, 1998b). As shown in (24), short movement of an accusative QP across a dative QP can reconstruct for scope as these examples are scopally ambiguous. However, crucially, in both interpretations, a variable or an anaphor embedded in the moved QP *cannot* be bound by the 'moved across' QP. Thus, reconstruction for binding is not possible in these contexts.

(24) [Lechner 1998b]

a. *weil sie* [*ein Bild von seinem*$_{*i}$ *Auftritt*] [*jedem Kandidaten*]$_i$ t_{ACC} *zeigte*
since she [a.ACC picture of his appearance] [every.DAT candidate] t_{ACC} showed
'since she showed a picture of his appearance to every candidate'

∃»∀; ∀»∃; in both interpretations, variable binding of *his* by ∀ is impossible.

b. *weil sie*$_i$ [*einige Freunde von einander*$_{i/*j}$] [*vielen Gästen*]$_j$ t_{ACC} vorgestellt haben
since they [some friends of each other].ACC [many guests] t_{ACC} introduced have
'since they introduced some of each other's friends to many guests'

some»many; *many»some*; in both interpretations, *each other* cannot be bound by *many guests* (if the subject is not plural, the sentence is ungrammatical)

These examples do not only pose a serious challenge for the traditional view that A/A'-movement differ in terms of reconstruction, they also provide yet another challenge for a scope principle as in (4). Recall that under such a principle, traces 'count' for the computation of scope. This claim, however, runs into problems when we try to apply it to Lechner's examples: if A-traces count, the scope principle would make the wrong prediction for binding; if A-traces do not count (as, e.g., suggested in Lasnik 1999), the scope principle would make the wrong prediction for scope.

The solution offered by Lechner, which I will essentially adopt here, is that the facts (24) necessitate a system with two types of reconstruction—syntactic vs. semantic reconstruction. In short, syntactic reconstruction involves lowering or selection of the lower copy of a moved element at LF. Semantic reconstruction, on the other hand, does not involve any movement but rather a particular type of interpretation of the trace left by movement. Following proposals by Cresti (1995), Rullmann (1995), Sharvit (1999), Lechner suggests that traces can be of two types: variables <e>, or generalized quantifiers <<e,t>t> (or intensional versions of the latter <<s,et>t>). If a trace is interpreted as a simple variable (cf. (25)a), the scope of the QP will correspond to the higher position. If, on the other hand, a trace is interpreted as a generalized quantifier (cf. (25)b), the contents of the QP will effectively be converted back into the position of the trace, resulting in the low scope interpretation of the QP. Crucially semantic reconstruction does not involve any literal reconstruction—i.e., the QP remains in the high position throughout the derivation.

(25) a. $[_\alpha$ QP_i ... $[_\beta$ t_i <e> ... Scope of QP: α
b. $[_\alpha$ QP_i ... $[_\beta$ t_i <<e,t>t> ... Scope of QP: β

Equipped with these tools, we can now return to the properties of reconstruction in German, summarized in (26) (see Lechner 1998b). As pointed out above, movement of the direct object across the indirect object but to the right of the subject (i.e., short movement as in (26)a) shows reconstruction effects for scope but not for binding. In Lechner's system with two types of reconstruction, this mismatch can now be accounted for: short movement as in (26)a cannot undergo *syntactic* reconstruction, thereby fixing binding, a property of LF, to the higher position. *Semantic* reconstruction, however, is possible, and hence a low scope interpretation of the moved element can arise. Movement of the direct object across the subject, on the other hand, does allow syntactic reconstruction, however, as Lechner shows, syntactic reconstruction into the base position is still impossible—the moved object can only reconstruct (in syntax/LF) to a position below the subject but above the indirect object (see (26)b). Semantic reconstruction, again, does not show such a restriction.

(26) a.	PF:		SUBJ	DO	IO	~~DO~~
	LF (binding):		SUBJ	{DO}	IO	~~DO~~
	Scope:		SUBJ	{DO}	IO	{DO}
b.	PF:	DO	SUBJ	~~DO~~	IO	~~DO~~
	LF (binding):	{DO}	SUBJ	{DO}	IO	~~DO~~
	Scope:	{DO}	SUBJ	{DO}	IO	{DO}

Let me summarize where we stand at this point. Although Lechner refrains from the traditional terms A/A'-movement, let's call movement to a position above the subject *A'-movement* and movement to a position below the subject *A-movement* (we will see below that these notions, as used traditionally, are insufficient to explain reconstruction, but they are convenient for current purposes). If we further assume that A'-movement also involves a step of A-movement, as indicated in (26)b, the following generalization emerges: both A- and A'-movement can undergo semantic reconstruction, but only A'-movement can undergo syntactic reconstruction. While Lechner's account allows us to get around the reconstruction paradox previous accounts are faced with, the main question still remains: Why can A'-movement undergo *syntactic* reconstruction in German and Japanese, but A-movement can't?[9] I believe that the ScoT system promoted here provides an answer to this long-standing question.

4.2.3 Back to ScoT

Let us start with the basic lack of syntactic reconstruction in A-movement contexts (see again below for a qualification of the relevance of the A- vs. A'-distinction). Example (24)a from Lechner, repeated here as (27)a, shows again that a variable embedded in the moved element B cannot be bound by A. This follows straightforwardly from ScoT. As shown in Table 10, reconstruction would lead to a PF—LF mismatch, hence a ScoT violation. The availability of (27)b—i.e., a derivation without overt movement, which is, of course, possible and licenses binding—guarantees that the ScoT violation in (27)a is fatal. As for the fact that (27)a, when no variable binding is intended, is ambiguous, I will follow Lechner and invoke semantic reconstruction, which, as outlined above, is a post-LF mechanism not affecting the LF configuration, and hence will not figure into the ScoT evaluation.[10]

(27) a. **weil* *sie* [*ein Bild von seinem*$_i$ *Auftritt*] [*jedem Kandidaten*]$_i$ t_B *zeigte* =(24)a
since she [a picture of his appearance] (B) [every candidate] (A) t_B showed
'since she showed a picture of his appearance to every candidate' *bound variable

b. *weil* *sie* [*jedem Kandidaten*]$_i$ [*ein Bild von seinem*$_i$ *Auftritt*] *zeigte*
since she [every candidate] (A) [a picture of his appearance] (B) showed
'since she showed a picture of his appearance to every candidate' ✓bound variable

T 10: A-reconstruction	LF	PF	ScoT
(27)b ✓	A»B	A»B	✓
(27)a * (Reconstruction)	A»B	B»A	*

What about A'-reconstruction then? Here all we need to add is the assumption (motivated below) that A'-moved elements have (the option of having) a particular discourse function, namely a topic interpretation (see Neeleman 1994, Frey 2001, for exactly this claim about A'-movement). Since quantifier scope cannot be used to safely diagnose syntactic reconstruction, I will use variable binding from now on. An example representing a clear case of syntactic reconstruction is given in (28)a. Assuming that the moved element B is a topic, we then arrive at the ScoT evaluations in Table 11. As shown there, if the information structure representation is included in the computation, the LF needed

[9] A popular account of this puzzle is to stipulate that A-movement does not leave a trace (see Lasnik 1999), and hence reconstruction is impossible. This account, however, cannot be maintained. The possibility of semantic reconstruction shows that there must be a trace—semantic 'reconstruction' is only possible when there is a trace which can be interpreted as a higher type trace.

[10] Note that allowing semantic reconstruction will not affect the account of QR provided in section 2, since the two interpretations of QP-structures only arise when there are traces. Thus, the account here, as well as any account involving the Scope Principle in (4), needs to assume that in examples such as (1), there are no traces of the subject below the highest position of the object. If this assumption is at odds with one's view of clause structure, Case licensing etc., a more complex account of which traces qualify for semantic reconstruction (see for instance Lechner 1998b) might be necessary.

to satisfy binding (A»B) will be the opposite of the information structure (B»A, since topics need to precede other elements at that level). Thus, there is again no way for the PF to match both representations, and hence the desired tie will arise when ScoT compares (28)a with the non-moved alternative (28)b.

(28) a. *weil* [*seinen*$_i$ *Sohn*] [*jeder* Vater]$_i$ t_B *liebt*
since [his.ACC son] (B) [every.NOM father] (A) t_B loves
'since every father loves his son' ✓bound variable

b. *weil* [*jeder* Vater]$_i$ [*seinen*$_i$ *Sohn*] *liebt*
since [every.NOM father] (A) [his.ACC son] (B) loves
'since every father loves his son' ✓bound variable

T 11: German: TOP-scrambling		LF	IS	PF	ScoT
(28)b	✓	A»B	B [TOP]»A	A»B [TOP]	* [IS]
(28)a	✓ (synt. reconstruction)	A»B	B [TOP]»A	B [TOP] »A	* [LF]

This ScoT based account of A- vs. A'-reconstruction now leads us to a new characterization of the phenomenon, which an initial empirical investigation indicates is advantageous.[11] As shown in Tables 10 and 11, the distinction between A- and A'-movement is, in fact, irrelevant. Rather, reconstruction is possible whenever overt movement (whether A or A') yields a better information structure. If the moved element is interpreted as a topic, syntactic reconstruction is possible; if the moved element is not interpreted as a topic, syntactic reconstruction is impossible.

The first piece of evidence for this view and against the traditional A/A'-view is provided by (alleged) A-movement constructions in which the moved element is a topic. As shown in (29), in contrast to (27)a, short scrambling *does* allow syntactic reconstruction, as soon as the moved element is clearly marked or set up as a topic ((29)a involves the by now familiar rise-fall intonation, and (29)b involves a context that sets up the moved element as a contrastive topic).[12] Thus, although movement does not cross the subject, (29)a patterns with (28)a rather than (27)a in terms of reconstruction, exactly because it shares the information structure properties of (28)a.

(29) a. *weil* *sie* [*/EIN Bild von seinem*$_i$ *Auftritt*] [*JEDem\ Kandidaten*]$_i$ t_{TOP} *zeigte*
since she [a picture of his appearance]$_{TOP}$ [every candidate]$_{FOC}$ t_{TOP} showed
'since she showed every candidate a picture of his appearance' ✓bound variable

b. *Glaubst du, dass sie ein Bild von der Show jedem Kandidaten zeigen soll?*
Do you think she should show a picture of the show to each candidate?
Ich weiß es nicht, aber ich denke…
I don't know, but I think…

dass *sie* [*ein Bild von seinem*$_i$ *Auftritt*] [*jedem Kandidaten*]$_i$ t_{TOP} *zeigen sollte*
that she [a picture of his appearance]$_{TOP}$ [every candidate] t_{TOP} show should
'that she should show every candidate a picture of his appearance' ✓bound variable

The second prediction that the account presented here makes is that if an A'-moved object (e.g., the ACC in (28)a) is not interpreted as a topic, reconstruction should be impossible. These facts are again more subtle, since, as pointed out in section 4.1, it is fairly easy to adjust the context to allow a topic interpretation for the moved element, but they do appear to go in the right direction. That is, if the subject is interpreted as a topic and the object as the focus, movement of the object across the subject plus reconstruction is clearly disfavored (cf. (30)b). (30)b is only possible as an utterance in this context if the information structure is adjusted again roughly to "I don't know the answer to your question, but if we are speaking of sons…", i.e., when the moved element B is turned into a topic.[13]

[11] See also Williams (2003) for a similar conclusion but different implementation.
[12] Thanks to W. Lechner, C. Mayr, and V. Schmitt for confirming these judgments.
[13] (30) should also be contrasted with the following context, in which, as predicted, both examples in (30), are perfectly natural.
Was ist mit den Töchtern? Wer glaubst du liebt seine Tochter? Das weiß ich nicht, aber ich bin sicher…
What about the daughters? Who do you think loves his daughter? I don't know, but I'm sure…
A [FOC]; B [TOP]

(30) *Was ist mit den Müttern? Wen glaubst du liebt jede Mutter?*
What about the mothers? Who do you think every mother loves?
Das weiß ich nicht, aber ich bin sicher…
I don't know, but I'm sure…
A [TOP]; B [FOC]

a. *dass* [*jeder* Vater]$_i$ [*seinen*$_i$ *Sohn*] *liebt*
that [every.NOM father] (A) [his.ACC son] (B) loves
'that every father loves his son' ✓bound variable

b. #*dass* [*seinen*$_i$ *Sohn*] [*jeder* Vater]$_i$ t_B *liebt*
that [his.ACC son (B) [every.NOM father] (A) t_B loves
'that every father loves his son' *bound variable

Table 12 summarizes the LF/IS/PF combinations relevant for syntactic reconstruction.[14]

T 12: Syntactic reconstruction		LF	IS	PF	ScoT
(30)a, (18)b	✓	A»B	A [TOP] » B [FOC]	A [TOP] » B [FOC]	✓
(30)b	* (Reconstruction)	A»B	A [TOP] » B [FOC]	B [FOC] » A [TOP]	* [LF, IS]
(28)b, (19)b	✓	A»B	B [TOP] » A [FOC]	A [FOC] » B [TOP]	* [IS]
(28)a	✓ (Reconstruction)	A»B	B [TOP] » A [FOC]	B [TOP] » A [FOC]	* [LF]

To sum up the discussion of reconstruction in German, I have shown that Lechner's distinction between syntactic and semantic reconstruction allows us to provide a uniform account of scope and reconstruction in German. While semantic scope reconstruction is regulated by the semantic properties of quantifiers and traces (see Lechner 1996, 1998a, 1998b for a full set of restrictions), whether syntactic reconstruction is available or not is determined by ScoT. I have argued that the traditional view according to which it is the A- vs. A'-distinction that determines whether syntactic reconstruction is possible or not is empirically unsatisfactory, since both reconstruction with (traditional) A-movement as well as lack of reconstruction with A'-movement are attested. The ScoT model promoted here, on the other hand, draws the correct distinction: syntactic reconstruction (of both A- and A'-movement, though these terms have been shown to have become somewhat irrelevant) is only possible if the moved element is marked/interpreted as a topic. More specifically, reconstruction has been given the same account as QR: isomorphism is required by ScoT, and hence reconstruction is excluded, unless overt movement (whether A or A') yields a better information structure. Attributing the lack of reconstruction to ScoT—i.e., an economy constraint, rather than a (hard) syntactic constraint—has the further advantage that, similar to what I have suggested about QR, the model presented here is not required to posit a language specific restriction against A-reconstruction in German(-type languages). A-reconstruction, like QR, can be seen, at least as a null hypothesis, as a universally available operation. In the last subsection, I will now turn to English and show how the current system covers the differences regarding A-reconstruction reported between an English-type language and a German-type language.

4.2.4 A-reconstruction in English vs. German

A typical context which has been argued to involve A-reconstruction in English is raising and passivized ECM constructions. As shown in (31)a,b, subjects in these constructions can be interpreted within the embedded clause. In (31)a, the existentially quantified DP may scope beneath *seem*. Similarly, the most sensical interpretation of (31)b is an interpretation in which the existential QP *one*

[14] It seems important to stress again at this point that ScoT only compares convergent derivations. Thus, one might expect that, given the appropriate information structure set up, ScoT might (incorrectly) license examples such as i., similar to the possible QR cases in (17)a, or (18)b (see Table 8). This, however, does not appear to be the case. I assume that QR is blocked on independent grounds in examples such as i.: QR of a quantificational DP across a non-quantificational DP is impossible (see Fox 1995, 2000). Thus, the derivation in i. is ruled out by constraints on QR, before it ever reaches ScoT.

i. **dass* [*sein*$_i$ *Vater*] [*jeden Sohn*]$_i$ *liebt*
that [his.NOM father] (A) [every.ACC son] (B) loves
'that his father loves every son'

soldier is interpreted within the scope of the universal quantifier *every battle*, an interpretation, which has been argued to arise via A-reconstruction of *one soldier* plus short QR of *every battle*. (31)c, which lacks this interpretation, shows that the scope relation ∀»∃ in (31)b cannot be achieved via long QR of *every battle* across *one soldier*, since this would not explain why wide scope of the universal QP is not available in (31)c, that is, just in cases where a variable which is to be bound by the higher quantifier 'traps' the QP in the high position. Thus, examples of this sort provide strong evidence for the existence of A-reconstruction in English (see Lebeaux 1991, 1995, Romero 1997, Fox 1999, 2000, 2003, Fox and Nissenbaum 2004).

(31) a. Someone from NYC seems to be at John's parties. ∃»seem; seem»∃

b. One soldier is expected by Napoleon to die in every battle ∀»∃/#∃»∀

c. #One soldier$_i$ is expected by his$_i$ commander to die in every battle *∀>>∃/#∃>>∀

Furthermore, in contrast to (non-topic) A-reconstruction in German, syntactic reconstruction can be shown to be clearly available in cases such as (32)a (example from Fox 1999:161), in which a pronoun embedded in the subject of a raising construction is bound by a lower quantified indirect argument. Note that this bound variable interpretation must again be the result of reconstruction of the subject below the universal QP rather than QR of the universal QP across the subject, since QR should yield a *weak cross-over* violation, exactly as is the case in (32)b where there is no option of reconstruction.

(32) a. Someone from his$_i$ class seems to every professor$_i$ t_{SUBJ} to be a genius. [Fox 1999:161]

b. ??Someone from his$_i$ class shouted to every professor$_i$ to be careful. [Fox 1999:161]

Of interest to our discussion is the question of why A-reconstruction in examples such as (31)a,b does not constitute a (fatal) ScoT violation, in particular, in light of the existence of *there* insertion contexts such as (33)a—i.e., constructions which lack subject movement and hence represent the scope relation *seem»someone* overtly. To answer this question, we need to look more closely at the interpretation of (33)a: (33)a differs crucially from (31)a in that it is not ambiguous in the way (31)a is; (33)a only allows a low scope interpretation of the subject—i.e., an interpretation that is isomorphic to the surface structure.

(33) a. There seems to be someone from NYC at John's parties. *∃»seem; OKseem»∃

b. *Seems to be someone from NYC at John's parties

The account provided in B&W follows Bobaljik (2002) and is predicated on the observation that English respects the "classic" EPP. That is, in English, the finite subject position must be overtly filled. [15] As (33)b demonstrates, the EPP is a hard constraint in English—violation leads to ungrammaticality. Now, English offers two possibilities for avoiding an EPP-violation, one is overt movement ((31)a), the other is insertion of a dummy-element, the expletive *there* ((33)a). Crucially, B&W assume that *there* is not part of the (syntactic) numeration, but is inserted at PF, to satisfy the EPP (similar to CP-expletives in German or Icelandic), and insertion of an expletive is costly, which is expressed by means of the economy condition in (34):

(34) DEP (Economy Condition): Don't insert Expletive Pronoun

Looking at the examples in (31)a and (33)a, the reader will have discovered the familiar ¾ signature paradigm already: there are two possible LFs, one (*seem*»∃) can be expressed by two PFs, whereas the other (∃»*seem*) only allows one PF—namely the PF that is isomorphic to that LF. Armed with the two

[15] In Wurmbrand (2006), I argued that German lacks the EPP property and that the subject position can remain empty throughout the derivation, This property, unfortunately, prohibits us from testing whether A-reconstruction exists in German raising constructions. The interpretation of the German analogue of examples such as (31)a is very clear: raising (as well as modal) constructions are ambiguous in German in exactly the same way they are in English. However, due to the head-final nature of German, it is impossible to tell whether in these cases the subject has undergone movement or remained in its *v*P-internal position. If one could show that subject movement has taken place under the low scope interpretation of the subject, an argument for A-reconstruction in German could be made. However, since the low scope interpretation of the subject could also arise via the subject simply staying in its base position, a conclusive argument for the existence of A-reconstruction is not possible.

economy conditions, DEP and ScoT, the pattern follows. This is summarized in Table 13. For the interpretation ∃»*seem*, the isomorphic PF satisfies both ScoT and DEP, whereas the non-isomorphic one violates both. Hence the former is a clear winner. The interpretation *seem*»∃, on the other hand, yields the familiar quandary. The syntactic resources of English permit the DP to remain in situ, satisfying ScoT, but this requires a costly expletive to occupy the subject position. Conversely, overt movement in order to satisfy the EPP avoids the need for an expletive, but the cost is a ScoT violation. Thus, both PFs are possible.

T 13: English raising		LF	PF	ScoT	DEP
(33)a	✓	*seem*»∃	*there seem*»∃	✓	*
(31)a	✓ (reconstruction)	*seem*»∃	∃»*seem*	*	✓
(31)a	✓	∃»*seem*	∃»*seem*	✓	✓
(33)a	* (QR)	∃»*seem*	*there seem*»∃	*	*

In sum, the crucial difference between English and German regarding A-reconstruction is essentially the EPP—overt subject movement or expletive insertion is required in English (as a hard syntactic property), whereas A-movement in German is 'free'. Since there is no constraint competing with ScoT in German (non-topic) movement contexts, ScoT will rule out non-isomorphic LF-PF configurations. In English, on the other hand, ScoT interacts with another economy constraint, which yields the famous ¾ signature, hence allowing non-isomorphic LF-PF configurations in some specific well-defined cases.

5. Conclusion

In this paper, I have addressed the following four questions regarding scope in German:

i. Why does German, in contrast to English, show scope rigidity in certain constructions (e.g., subject—object QPs)?
ii. Why does scope rigidity disappear under certain intonational marking?
iii. Why does scope rigidity disappear in constructions with overt movement?
iv. Why do both German and English allow inverse scope freely in, for instance, inverse linking constructions?

I have suggested that at the core of all answers is an economy constraint—ScoT—which favors isomorphic LF—PF relations whenever possible. More specifically, I have argued that scope rigidity arises when a ScoT violating derivation (rows b. and d. in Table 14) competes with a ScoT matching derivation and no other economy constraints are in effect. This is the case, for instance, in German subject—object QP configurations or prepositional inverse linking constructions, in which the QR and reconstruction derivations compete with derivations involving overt movement. Furthermore, I have argued that syntactic reconstruction is impossible in German non-topic movement constructions, and following Lechner (1996, 1998a, 1998b), that the effect of inverse scope in these cases is the result of semantic reconstruction.

T 14: Scope rigidity		LF	PF	ScoT
a.	✓	B»A	B»A	✓
b.	* (QR)	B»A	A»B	*
c.	✓	A»B	A»B	✓
d.	* (Reconstruction)	A»B	B»A	*

Inverse scope, on the other hand, is licensed in two scenarios. First, a ScoT violation as in row b. in Table 14 is tolerated when the derivation in row a. is not available (i.e., when the language does not generate this LF-PF combination due to some independent restriction on overt movement). This is the case in English subject—object QP constructions, as well as in German genitive inverse linking constructions. Second, inverse scope will be possible in cases where a ScoT violations arising due to QR or reconstruction (see rows b. and d. in Table 15) is 'cancelled out' due to the fact that the competitor also violates an economy constraint. This has been shown to be the case in German QP

constructions with a rise-fall intonation (rows a.,b. in Table 15) and A'-reconstruction (row c.,d. in Table 15), as well as English A-reconstruction.

T 15: Non-rigid scope		LF	IS	PF	ScoT
a.	✓	B»A	A [TOP] » B [FOC]	B [FOC] » A [TOP]	* [IS]
b.	✓ (QR)	B»A	A [TOP] » B [FOC]	A [TOP] » B [FOC]	* [LF]
c.	✓	A»B	B [TOP] » A	A » B [TOP]	* [IS]
d.	✓ (Reconstruction)	A»B	B [TOP] » A	B [TOP] » A	* [LF]

As shown in Table 15, a major feature of the account of German is information structure. I have argued, in line with Williams (2003) and Neeleman and van de Koot (2008), that the relation between PF and information structure plays a crucial role in the determination of scope. So far, the empirical investigation has only covered German, and it will be interesting to extend this account (in particular, to combine information structure and scope) to the constructions discussed by the authors above in English and Dutch.

More broadly, the paper has argued for the following claims. First, there exist 'soft' constraints (economy conditions) that value a particular type of correspondence between LF and PF representations. Second, these constraints are uni-directional: LF (broadly construed) is calculated first, and determines PF. Third, scope rigidity characterizes configurations, not languages, which is supported by the existence of QR in certain constructions in German (as argued in Sauerland 2001 and Sauerland and Bott 2002). Fourth, the distribution of rigidity effects is (largely) predictable from independent variation in the syntactic resources of various languages (e.g., possibilities for scrambling).

Although, as the reader will undoubtedly have noted, several questions have been left open (e.g., the distribution of the *Move constraint, the question of what counts as 'free' word order), the model proposed has brought together a number of (in part) unrelated phenomena, provided a uniform account of these, and overcome several problems and inconsistencies of previous accounts, which, I believe, is a promising and worthwhile result.

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