Chapter 8

On reconstruction and coordination

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0 Overview*

This article is concerned with the evaluation of Ā-bound empty categories on the one hand, and with aspects of the theory of coordination on the other. As Koster (1987) urged, the way bound categories are evaluated should be deducible from the general principle 'Share Property' in conjunction with other universal principles (and, perhaps, learnable properties of particular languages). Clearly, this idea constitutes a research program rather than an articulated theory. The observations discussed in Section 3 through Section 6 are meant to contribute to this research program.

One main problem in the evaluation of traces are phenomena falling under the rubric of 'reconstruction'. When a clause contains a dislocated phrase, such as *this fool* in *this fool I can't stand*, certain conditions on well-formedness and/or interpretation seem to lead to incorrect predictions, or not be applicable at all when applied at S-structure. There are two approaches to this problem in the literature: (i) one may restrict the application of those conditions to a level of representation distinct from S-structure (true reconstruction), or (ii) one may

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extend the definition of those conditions in such a way that they can be applied correctly at S-structure (pseudo-reconstruction). Although (i) and (ii) are widely believed to be empirically equivalent, observations on coordination suggest that they are not, in that (ii) is incompatible with standard assumptions about how coordinate structures are translated into a semantic representation. Hence either (i) is correct, or the theory of translation must be modified.

The presentation proceeds as follows. As a general background the fundamentals of the theory of coordination are reviewed in Section 1, and the results are used in Section 2 to establish the most basic properties of German clause structure. In Section 3 some observations on scope and binding properties of dislocated phrases such as alluded to above are displayed, and in Section 4 the two approaches to reconstruction are spelled out. A discussion of coordination and its implications follows in Section 5. On the basis of a number of considerations, among which parasitic gaps figure importantly, I conclude in Section 6 that (i) – true reconstruction – cannot be correct.

1 Theory of coordination

The theory of coordination that I assume is largely that of Neijt (1979: Chapter 1). Its main characteristics will be recapitulated in the sections to follow.

1.1 Symmetric coordination, unreduced

Consider an S-structure configuration such as (1):

(1) ^{1}A ... ^{k}A (&) ^{1}B ... & ^{n}B $^{k+1}$A ... ^{m}A

where each ^{i}B is a conjunct, each & is a coordinating element (e.g., a particle such as *und* 'and', *oder* 'or', *noch* 'nor'), and each ^{i}A is an element external to the conjuncts ($m \geq 0$; $n \geq 2$). The fundamental principle is then (2):

(2) *Conservation Condition:*
Each ^{i}B is a constituent
   i. whose structure and whose combinatorial properties follow from general rules that are independent from coordination, or
   ii. which conforms to the coordination scheme (1).

In examples such as (3) the properties of the conjuncts indicated by brackets follow from rules independent from coordination, in accordance with (2i):

(3) a. sie hofft, daß [Karl arbeitet] oder [Heinz nachdenkt]
she hopes that Karl works or Heinz meditates
'she hopes that Karl works or Heinz meditates'

b. sie hofft, daß weder [Maria arbeitet] noch [Hanna nachdenkt]
she hopes that neither Maria works nor Hanna meditates
'she hopes that neither Maria works nor Hanna meditates'

In an example such as (4) the conjuncts themselves are coordinate structures in accordance with (2ii):

(4) sie hofft, daß weder [Karl arbeitet oder Heinz nachdenkt] noch [Maria arbeitet oder Hanna nachdenkt]
'she hopes that neither Karl works or Heinz meditates, nor Maria works or Hanna meditates'

Recursive embedding of coordinate structures within coordinate structures as seen here is naturally accounted for by the assumption that the string "(&) ^{1}B … & ^{n}B" in (1) is a constituent, which I will refer to as a 'coordinate phrase'.

For symmetric coordination – which is the only type of coordination that we will consider here – also some principle like (5) holds:

(5) *External Homogeneity Condition:*
The combinatorial properties of each ^{i}B are satisfied by ^{1}A, … , ^{m}A in the same way as the combinatorial properties of every other ^{j}B are.

We will not attempt to make this rather vague statement precise. Under appropriate specifications, it should follow from (5) that in the typical case all conjuncts are members of the same syntactic category and that each conjunct stands in the same grammatical relation to the external elements as every other conjunct. Specifically, the Coordinate Structure Constraint with its 'Across-The-Board exception' (6) should follow from (5):

(6) *CSC/ATB:*
If there is an ^{i}A in a Ā-position that binds a trace in one ^{j}B, it binds a trace in every ^{k}B.

It should follow, then, that each single conjunct ^{i}B may be substituted for the whole coordinate phrase *salva grammaticalitate*. For example, (7) conforms to

(6), and the substitutions in (8) are possible, whereas (9) does not conform to (6) and the substitutions in (10) are impossible:[1]

(7) a. [den Vorschlag]$_i$ [[unterstützen viele t_i] und [lehnt kaum einer t_i ab]]
the proposal support many and rejects hardly one off
'many support the proposal and hardly anyone rejects it'

b. ich weiß nicht, [welchen Vorschlag]$_i$ [[viele t_i unterstützen] und [kaum einer t_i ablehnt]]
I know not which proposal many support and hardly one rejects
'I don't know which proposal is supported by many and rejected by hardly anyone'

(8) a. i. [den Vorschlag]$_i$ [unterstützen viele t_i]
ii. [den Vorschlag]$_i$ [lehnt kaum einer t_i ab]

b. i. ich weiß nicht, [welchen Vorschlag]$_i$ [viele t_i unterstützen]
ii. ich weiß nicht, [welchen Vorschlag]$_i$ [kaum einer t_i ablehnt]

(9) a. * [den Vorschlag]$_i$ [[unterstützen viele t_i] und [lehnt kaum einer ihn$_i$ ab]]

b. * ich weiß nicht, [welchen Vorschlag]$_i$ [[viele t_i unterstützen] und [kaum einer zuhört]]

(10) a. * [den Vorschlag] [lehnt kaum einer ihn ab]

b. * ich weiß nicht, [welchen Vorschlag] [kaum einer zuhört]

[1]There are some exceptions to substitutivity, the most conspicuous case being NPs coordinated by *and* in an environment requiring a plural NP, as in (i):

(i) a. John and Bill may be brothers (*John may be brothers/a brother)
b. John and Bill are nice (*John are nice)
c. John and Bill will both be decorated (*John will both be decorated)

There are also some types of coordinate structures not conforming to (5) and its corollaries, which consequently are 'asymmetric' coordinations. See Höhle (1990) for asymmetric coordination in German, and Entjes (1972) on Dutch.

Split coordinations such as (ii) will not be considered here:

(ii) sie hat gestern einen Hund gekauft oder eine Katze
she has yesterday a dog bought or a cat
'she bought a dog yesterday, or a cat'

1.2 Reductions

Naturally the Conservation Condition (2) and its corollaries are only true of a level of representation where no construction specific ellipsis has taken place. There are two types of ellipsis specific for (symmetric) coordination in German:

(11) *Right Periphery Ellipsis (RPE):*
In some ^{i}B a string at the right periphery is ellipsed at surface structure under phonological and sense identity with a string at the right periphery of the final conjunct ^{n}B.

(12) *Gapping:*
In some ^{i}B an independent verb is ellipsed (possibly together with certain other elements of the same conjunct) at surface structure under sense identity with corresponding elements in the initial conjunct ^{1}B.

RPE licenses examples such as (13):

(13) a. [Heinz sollte den Hund ___] und [Karl sollte den Kater füttern]
Heinz should the dog and Karl should the cat feed
'Heinz should feed the dog, and Karl should feed the cat'

b. [Heinz hört dir ___] und [Karl hört mir zu]
Heinz hears you and Karl hears me to
'Heinz listens to you and Karl listens to me'

The conjuncts *Heinz sollte den Hund* in (13a) and *Heinz hört dir* in (13b) do not conform to clause (i) of the Conservation Condition (2), in that constituents like these are ungrammatical unless licensed by RPE.

Similarly for Gapping:

(14) a. [gesungen hat Karl] und [geschrien ___ Heinz]
sung has Karl and cried Heinz
'Karl has sung and Heinz has cried'

b. [wen sollte sie suchen] und [wen ___ er ___]
whom should she seek and whom he
'whom should she look for and whom should he look for'

Again, constituents such as *geschrien Heinz* in (14a) and *wen er* in (14b) are ungrammatical unless licensed by Gapping (or as a kind of elliptical response in discourse). (Note by the way that there are two nonadjacent elision sites in (14b),

as a consequence of the fact that a dependent (non-finite) verb may be gapped in tandem with the finite verb.)

Both RPE and Gapping are optional, of course. But in structures with multiple conjuncts an analogue to the External Homogeneity Condition (5) can be observed to hold:

(15) *Internal Homogeneity Condition:*
If in a conjunct ^{i}B there is an elision site licensed by an expression contained in a conjunct ^{j}B, then there is a corresponding elision site in each conjunct ^{k}B ($k \neq i$), where ^{k}B is a sister of ^{j}B.

Elision sites may be licensed by RPE or by Gapping. Consider first Gapping:

(16) a. [Karl füttert den Hund], [Heinz ___ den Kater] oder [Walter ___ den Ochsen]
Karl feeds the dog Heinz the cat or Walter the ox
'Karl feeds the dog, Heinz feeds the cat, or Walter feeds the ox'

b. * [Karl füttert den Hund], [Heinz ___ den Kater] oder [Walter füttert den Ochsen]

c. * [Karl füttert den Hund], [Heinz füttert den Kater] oder [Walter ___ den Ochsen]

If interpreted as a ternary coordination with *oder* 'or', all non-initial conjuncts must contain a Gapping site. Similarly for RPE:

(17) a. [Karl füttert ___], [Heinz tränkt ___] oder [Walter streichelt den Hund]
Karl feeds Heinz waters or Walter caresses the dog
'Karl feeds the dog, Heinz waters the dog, or Walter caresses the dog'

b. * [Karl füttert den Hund], [Heinz tränkt ___] oder [Walter streichelt den Hund]

c. * [Karl füttert ___], [Heinz tränkt den Hund] oder [Walter streichelt den Hund]

The two Homogeneity Conditions (5) and (15), taken together, account for restrictions on elision in conjuncts that are coordinate phrases. Consider (18a):

(18) a. [Karl füttert den Hund] und [Heinz ___ den Kater] oder [Walter füttert den Ochsen]

b. [[Karl füttert den Hund] und [Heinz ___ den Kater]] oder [Walter füttert den Ochsen]

'[Karl feeds the dog and Heinz feeds the cat], or Walter feeds the ox'

c. * [Karl füttert den Hund] und [[Heinz ___ den Kater] oder [Walter füttert den Ochsen]]

'Karl feeds the dog, and [Heinz feeds the cat or Walter feeds the ox]'

This string of conjuncts can be interpreted as (18b), where no condition on elision is violated. But it cannot be interpreted as (18c): although the structure conforms to (12) and (15), it does not conform to (5), in that the combinatorial properties of the conjunct *Heinz den Kater* are dependent on the conjunct *Karl füttert den Hund*, whereas those of the conjunct *Walter füttert den Ochsen* are not. Consider also (19a):

(19) a. [Karl füttert den Hund] und [Heinz füttert den Kater] oder [Walter ___ den Ochsen]

b. [Karl füttert den Hund] und [[Heinz füttert den Kater] oder [Walter ___ den Ochsen]]

'Karl feeds the dog, and [Heinz feeds the cat or Walter feeds the ox]'

c. * [[Karl füttert den Hund) und [Heinz füttert den Kater]] oder [Walter ___ den Ochsen]

'[Karl feeds the dog and Heinz feeds the cat], or Walter feeds the ox'

Here the interpretation (19b) does not violate any condition. The structure of (19c) conforms to (12), but it violates (15): there is an elision site in the last conjunct, licensed by *füttert* in the conjunct *Karl füttert den Hund*, but the sister of the latter conjunct does not contain an elision site. Finally, consider (20a):

(20) a. [Karl füttert den Hund] und [Heinz ___ den Kater] oder [Walter ___ den Ochsen]

b. [[Karl füttert den Hund] und [Heinz ___ den Kater]] oder [Walter ___ den Ochsen]

'[Karl feeds the dog and Heinz feeds the cat], or Walter feeds the ox'

c. [Karl füttert den Hund] und [[Heinz ___ den Kater] oder [Walter ___ den Ochsen]]

'Karl feeds the dog, and [Heinz feeds the cat or Walter feeds the ox]'

As expected, (20a) is ambiguous between (20b) and (20c), since none of these violates any condition. When we compare (20c) with (18c) we can see that (5) induces a CSC/ATB effect on reductions. Comparing (20b) with (18b) and (19c) we can see that the reduction in the last conjunct *Walter den Ochsen* is parasitic upon the reduction in the conjunct *Heinz den Kater*, as required by (15). (For RPE similar sets of examples can easily be constructed.)

As long as only RPE or Gapping is applied within a coordinate structure, at least one conjunct (the final one or the initial one) must conform to the Conservation Condition. But RPE and Gapping may act independently of one another with the result that no unreduced conjunct remains:

(21) [Karl hört dir ___], [Heinz ___ mir ___] oder [Walter ___ ihr zu]
Karl hears you Heinz me or Walter her to
'Karl listens to you, Heinz listens to me, or Walter listens to her'

Here the initial conjunct contains an RPE site licensed by *zu* in the final conjunct, and the final conjunct contains a Gapping site licensed by *hört* in the initial conjunct. Because of the Internal Homogeneity Condition the middle conjunct has to contain a Gapping site as well as an RPE site.

Despite considerable analytical efforts, the nature of the constraints that Gapping is known to obey has to a large degree remained something of a mystery; see, for example, Kohrt (1976) and Neijt (1979). RPE – which also goes under the names of Left Deletion, Shared Constituent Coordination, Backward Conjunction Reduction, Backward Gapping and Right Node Raising – is special in its own way. It allows parts of words to be ellipsed:

(22) [Karl suchte den Ein__] und [Heinz suchte den Ausgang]
Karl seeked the in and Heinz seeked the outway
'Karl looked for the entry and Heinz looked for the exit'

(For details see Toman (1985: §4), Höhle (1985) and Neijt (1987).) It also allows non-constituents to be ellipsed. In (23), for example, the converb (the so-called 'separable verb prefix') *ein* and the N^0 *Lösung* are ellipsed, which can never form a constituent:[2]

[2]To be more exact, the converb here presumably is a sister of a verbal trace (cf. Section 2) with which it forms a constituent, a verbal projection V^i. Since the count noun *Lösung* cannot function as an NP by itself, it cannot be a sister of that V^i. Rather it must be part of the NP *eine großzügige Lösung*, which in turn is part of a PP introduced by *für*.

Note incidentally that German has a null N^1 anaphor, similar to the English N^1 anaphor *one*, as in (i):

(23) [Karl tritt für eine großzügige ___] und [Heinz tritt für eine sparsame Lösung ein]
Karl steps for a generous and Heinz steps for a parsimonious solution in
'Karl pleads for a generous solution, and Heinz pleads for a parsimonious solution'

RPE in fact disobeys all (or nearly all) of the core constraints on movement rules; see Neijt (1979). In sum, RPE presumably is a process in the PF component, relating S-structure and surface structure.[3]

1.3 'Forward Conjunction Reduction'

Principles like (2) and (5) and reductions like (11) and (12) have, of course, been assumed ever since coordination has been a topic of theoretical scrutiny. The one assumption that distinguishes the present theory from most of its predecessors (as, for example, ch. 6 of Stockwell et al. (1973) and Terazu (1975)) and also from some more recent contributions (e.g., van Oirsouw (1985) and Goodall (1987)) is (24):

(24) There is no type of elision specific to coordination other than those specified in (11) and (12).

This means, specifically, that there is no general rule of Forward Conjunction Reduction (FCR, alias Right Deletion, Coordinate Deletion or Left Peripheral Deletion), which has been hypothesized to be basically something like the mirror image of RPE in that it deletes a string at the left periphery of some conjunct ^{i}B

(i) die großen Hunde haben die kleinen ___ gebissen
the big dogs have the little bitten
'the big dogs bit the little ones'

Nevertheless, the elision of *Lösung* in (23) cannot be an instance of the null anaphor but must be a consequence of RPE. (23) can be used as an answer to the question "What proposals are being made?". In the same context also (ii), without RPE, could be used as an answer, but (iii), with a null N^{1}, would be uninterpretable:

(ii) Karl tritt für eine großzügige Lösung ein, und Heinz tritt für eine sparsame Lösung ein

(iii) Karl tritt für eine großzügige ___ ein, und Heinz tritt für eine sparsame Lösung ein

[3]Possible targets of RPE must be flanked by strong morpheme boundaries, which in German coincide with syllable boundaries (Höhle 1985). Booij (1985) observes that RPE targets therefore are possible 'phonological words' (or rather, strings of phonological words). Hence, he argues, RPE is a rule operating on 'prosodic structure' in the PF component, not a rule of syntax proper.

under identity with a corresponding string in the initial conjunct [1]B. The reason for not assuming FCR is simply that for a number of different types of phenomena, conditions of well-formedness and/or interpretation require (2), (5) and (24) jointly to be true. In particular, structures resulting from FCR – as opposed to RPE and Gapping structures – are syntactically well-formed only if they comply with the Conservation Condition (2), and their interpretations often do not accord to that of their unreduced sources. See, for example, Partee (1970), Partee & Rooth (1983), Lie (1982) and Neijt (1978; 1979; 1987; 1989) for ample demonstration.[4]

Part of the semantic evidence for (24) can be easily appreciated by comparing instances of RPE with putative instances of FCR.[5] Consider an example with a quantified NP such as *jedes Spielzeug* 'every toy':

(25) [Karl zeigt den Kindern ___] oder [Heinz zeigt den Eltern
Karl shows the children or Heinz shows the parents
jedes Spielzeug]
every toy

This is synonymous with (26):

(26) [Karl zeigt den Kindern jedes Spielzeug] oder [Heinz zeigt den Eltern jedes Spielzeug]

'Karl shows every toy to the children, or Heinz shows every toy to the parents'

It does not mean 'for every toy, Karl shows it to the children or Heinz shows it to the parents'. Contrast this with (27):

(27) daß jeder Lehrer [den Kindern ein Buch zeigt] oder [den Eltern einen
that every teacher the children a book shows or the parents a
Film zeigt]
movie shows

'that every teacher shows a book to the children or shows a movie to the parents'

[4]Actually, FCR comes in two varieties in the literature, viz., as a deletion process and as an extraction-and-adjunction process. As an extraction process it is necessarily string vacuous with respect to the first conjunct and it results in adjunction structures that cannot be defended independently. Both varieties either undergenerate or overgenerate massively if they are not (i) very severely restricted and (ii) complemented by phrasal conjunction. But when phrasal conjunction is given, there is no point in having FCR in the first place. If it still turns out that some phenomenon can only be analyzed as the result of a conjunct initial elision process, care must be taken that this process be very narrowly constrained, otherwise gross misgeneration will be unavoidable. See Neijt (1979: 58f.) for a brief discussion, and Dowty (1988) for a different view, as well as Wesche (1989) for a critical appraisal.

[5]Part of the syntactic evidence for (24) is presently being rediscovered in the context of categorial grammar research, as in Houtman (1987).

This is not synonymous with what, according to FCR, would be its full form:

(28) daß [jeder Lehrer den Kindern ein Buch zeigt] oder [jeder Lehrer den Eltern einen Film zeigt]

'that every teacher shows a book to the children or every teacher shows a movie to the parents'

The difference between RPE structures such as (25) and putative FCR structures such as (27) is accounted for by assuming that (i) the interpretation of RPE structures proceeds from their unreduced form (which presumably is identical with S-structure), and (ii) that FCR does not exist, so that the interpretation of 'FCR structures' proceeds from an S-structure where the conjuncts and the coordinating particle are in the domain of the quantified NP *jeder Lehrer* 'every teacher'. Similar observations can be made for an indefinite NP such as *ein Buch* 'a book'. An instance of RPE such as (29) is synonymous with its unreduced form (30):

(29) [Karl zeigt den Kindern ___] und [Heinz zeigt den Eltern ein Buch]
Karl shows the children and Heinz shows the parents a book

(30) [Karl zeigt den Kindern ein Buch] und [Heinz zeigt den Eltern ein Buch]

'Karl shows a book to the children, and Heinz shows a book to the parents'

That is, the book shown to the children need not be identical with the book shown to the parents.[6] Contrast this with a putative FCR structure such as (31):

(31) daß ein Lehrer [den Kindern ein Buch zeigt] und [den Eltern einen
that a teacher the children a book shows and the parents a
Film zeigt]
film shows

'that a teacher shows a book to the children and shows a movie to the parents'

[6]Both the full form and the RPE structure can also be understood to involve only one book. But while this interpretation is completely natural with the RPE structure, it has a ring of pedantry and lack of cooperativeness about it with the unreduced structure. We may account for this in terms of a Gricean theory of cooperative communicative behaviour. If a speaker knows that only one book is involved and has no reason to hide this fact from the listener, pronominalization provides him with a natural way of expressing this unambiguously, as in (i):

(i) Karl zeigt den Kindern ein Buch, und Heinz zeigt es den Eltern
Karl shows the children a book and Heinz shows it the parents

'Karl shows a book to the children, and Heinz shows it to the parents'

Clearly, pragmatic principles of interpretation that depend on the form of an utterance proceed from surface structure.

This cannot be understood to involve two different teachers, one showing a book to the children and another showing a movie to the parents. But that would precisely be the preferred interpretation of its putative unreduced source (32):

(32) daß [ein Lehrer den Kindern ein Buch zeigt] und [ein Lehrer den Eltern einen Film zeigt]

'that a teacher shows a book to the children and a teacher shows a movie to the parents'

These facts are predicted by (24) but would be very difficult to account for under the assumption that FCR exists.

1.4 On θ-theory

Given that FCR does not exist, coordinate structures that involve an NP trace are problematic for some versions of θ-theory. Consider the definition of chains (33), the principle of θ-role assignment (34), and the θ-criterion (35) from Chomsky (1982: 333ff.) in relation to the data (36):

(33) C = (α_1, ..., α_n) is a *chain* if and only if:
  i. α_1 is an NP
  ii. α_i locally A-BINDS α_{i+1}
  iii. for $i > 1$,
    a. α_i is a non-pronominal empty category, or
    b. α_i is A-free
  iv. C is maximal, i.e., is not a proper subsequence of a chain meeting (i-iii).

(34) Suppose that the position P is marked with the θ-role R and C = (α_1, ... , α_n) is a chain. Then C is assigned R by P if and only if for some i, α_i is in position P and C has case or is headed by PRO.

(35) *θ-Criterion:*
Given the structure S, there is a set K of chains, K = {C_i }, where C_i = (α^i_1, ..., $\alpha^i_{n_i}$), such that:
  i. if α is an argument of S, then there is a $C_i \in K$ such that $\alpha = \alpha^i_j$ and a θ-role is assigned to C_i by exactly one position P;
  ii. if P is a position of S marked with the θ-role R, then there is a $C_i \in K$ to which P assigns R, and exactly one α^i_j in C_i is an argument.
  iii. In case (i), α has the θ-role assigned by P.

(36) a. John [may love Bill] and [may hate Mary]
b. John$_i$ [is loved t_i^1 by Bill] and [is hated t_i^2 by Mary]
c. John$_i$ [may love Bill] and [is loved t_i by him]

In (36a) the argument *John*, which occupies the subject position, is a member of the chain C_1 = (*John*). The subject position is θ-marked (under predication) by the phrase *may love Bill* and it is θ-marked by the phrase *may hate Mary*. Hence, according to (34) two θ-roles are assigned to C_1, and *John* has two θ-roles, according to (35iii).

In (36b) *John* is a member of the chains C_1 = (*John*, t^1) and C_2 = (*John*, t^2). Both chains are maximal, according to (33iv). The position occupied by t^1 is θ-marked by *loved*, while the position occupied by t^2 is θ-marked by *hated*. Hence each chain has one θ-role assigned to it, and *John*, being a member of both chains, has two θ-roles.

In (36c) *John* is a member of the chain C_1 = (*John, t*). Since chains must be maximal, there is no other chain that *John* is a member of. The subject position occupied by *John* is θ-marked by *may love Bill*, and the object position occupied by *t* is θ-marked by *loved*. Hence, both the subject position and the object position assign a θ-role to C_1, thus violating (35i).

We can see here that this version of the θ-theory induces an analogue of the CSC/ATB (6) for A-bound traces. The remarkable fact is that this analogue appears to be falsified by (36c). This, of course, is not particular to passive constructions, but is revealed by raising constructions just as well:

(37) a. John$_i$ [was likely t_i^1 to pass the exam] but [happened t_i^2 to flunk]
b. John$_i$ [may love Bill] and [is likely t_i to marry him]

Here again, (37a) is sanctioned by (35), as there are two chains with *John* a member of both, whereas (37b) is incorrectly ruled out by (35), since there is a chain two members of which occupy a θ-marked position.

There are a number of possible answers to this problem (which do not necessarily exclude one another). One could try to modify (35i) appropriately or one could replace 'NP movement', whose existence has been controversial at least since Shopen (1972), by rules operating on lexical entries. One could also question the assumption, presupposed in (36) and (37), that a subject phrase may originate in a position external to the VP. If it instead originates in a position contained in a projection of the verb (as a daughter of V^{max}), as argued by Fukui (1986), Kitagawa (1986) and others, then (36a,c) and (37b) have to be replaced by (38):

(38) a. John$_i$ [may t_i^1 love Bill] and [may t_i^2 hate Mary]
b. John$_i$ [may t_i^1 love Bill] and [is (t_i^2) loved t_i^2 by him]
c. John$_i$ [may t_i^1 love Bill] and [is likely (t_i^2) to t_i^2 marry him]

Here *John* in each case is a member of two different chains and has two θ-roles, sanctioned by the θ-criterion.

One may also question two other assumptions. In (34) it is presupposed that a position can be θ-marked without being case-marked and furthermore, that a subject argument may get its θ-role by two different mechanisms, viz., by predication or by transmission mediated by NP trace. Suppose instead that a position can only be θ-marked if it is case-marked.[7] Then the position of an NP trace, not being case-marked, cannot be θ-marked. The unassigned θ-role will then have to be assigned in the way that external θ-roles standardly are assigned, namely, to a position external to the constituent that immediately dominates the θ-role assigner. Cf. Williams (1984; 1987) where a very similar set of assumptions is argued for. Under these assumptions the position occupied by *John* in (36) and (37) is the only position involved in the relevant chains that is θ-marked, and (35i) is always (trivially) met.[8]

2 German clause structure

Traditionally declarative sentences in German are hypothesized to conform to the (simplified) topological scheme (39):

(39) K – FIN – X – VK – Y

where K is one constituent, FIN the position of the finite verb, X a string of (possibly null) constituents and VK a string of (possibly null) verbs. For the most part

[7] If this condition is to apply in full generality without any modification, the position of PRO must be case-marked. Otherwise, PRO must be treated as an exception, just as it is in (34).

[8] These assumptions would seem to be necessary, in fact, if it is true that the subject *keiner* 'no-one' in (i) is in its base position, as it appears to be:

(i) daß keiner$_i$ [den Hund streichelt] und [e_i gebissen wird]
that no the dog caresses and bitten becomes
'that no-one caresses the dog and is bitten'

Note that under these assumptions the S-structure position of the subject in English is a θ-position, and hence an A-position, even if the subject argument originates as a daughter of V^{max}, as in (38), because none of the trace positions in (38) could be θ-marked. See Höhle (1990) for an analysis of asymmetric coordination in terms of these assumptions.

we will disregard Y, which is a field reserved for extraposed elements. Examples such as (40) accordingly get the topological analysis (41):

(40) a. den Kindern zeigt Karl ein Buch
the children shows Karl a book
'Karl shows a book to the children'

b. den Kindern wird Karl ein Buch zeigen
the children will Karl a book show
'Karl will show a book to the children'

(41) a. den Kindern – zeigt – Karl ein Buch –
K – FIN – X – VK

b. den Kindern – wird – Karl ein Buch – zeigen
K – FIN – X – VK

This topological theory tells us next to nothing about the hierarchical structure of sentences, but the theory of coordination outlined in Section 1, if correct, provides us with a means to inquire into constituent structure. Consider an example such as (42):

(42) den Kindern zeigt [weder [Karl ein Buch] noch [Heinz einen Film]]
the children shows neither Karl a book nor Heinz a movie
'neither does Karl show a book to the children nor does Heinz show a movie to them'

Here, we can see that *Karl ein Buch* is an unreduced constituent: gapping cannot have been applied since the correlative coordinating particle *weder* 'neither' marks the beginning of the first conjunct and the finite verb *zeigt* 'shows' is outside that conjunct. But that conjunct would be an impossible kind of constituent if it would consist merely of *Karl* and *ein Buch*: neither of them stands in any grammatical relation to the other, but both may be said to stand in a grammatical relation to *zeigt*. (Analogously for the second conjunct *Heinz einen Film*.) Such a violation of strict compositionality would be inconceivable. We must suppose, therefore, that each conjunct contains a phonologically empty verb in relation to which *Karl* functions as subject and *ein Buch* functions as object. Since verbs are situated in VK (as long as they are not in FIN or in K), we arrive at the conclusion that (40a) has the structure (43):

(43) den Kindern – zeigt – [Karl ein Buch – [$_{V}$ *e*]]
K – FIN – [X – VK]

The empty verb obviously must be related to the verb in FIN. I will assume here that FIN is a Ā-position and that the empty verb is a trace bound by the verb in FIN.

In this way, coordination gives us a very simple argument that so-called verb-second clauses (and by analogous arguments 'verb-first' clauses) are properly speaking verb-final in S-structure, in that (i) FIN is not a verbal position proper but a position to be occupied by something bearing finite inflection, and (ii) the true verbal position is clause-final. It is realized by a verbal trace if the verb bearing finite inflection is attracted to the FIN position.[9] Furthermore, the theory of coordination – specifically hypothesis (24) – enforces the assumption that "FIN – X – VK" is a constituent. Consider an example such as (44):

(44) den Kindern [[zeigt Karl ein Buch] oder [zeigt Heinz einen Film]]
the children shows Karl a book or shows Heinz a movie
'Karl shows a book to the children, or Heinz shows a movie to them'

Since FCR does not exist, *zeigt Karl ein Buch* must be an unreduced constituent (analogously for *zeigt Heinz einen Film*).

The K-position can be occupied by a constituent of virtually any type with any of a number of different functions. In (45a), for example, it is occupied by a direct object; in (45b) by an indirect object; in (45c) by a subject; in (45d) by a non-finite verb. In (45e) it is occupied by the pronominal *da* 'there' that originates in a 'pronominal PP' *davon* 'there-of, of that,' the preposition *von* 'of' being stranded in the X-field:

(45) a. den Vorschlag – unterstützen viele (= (8ai))
the proposal support many
'many support the proposal'

b. den Kindern – zeigt Karl ein Buch (= (40a))
the children shows Karl a book
'Karl shows a book to the children'

c. der Karl – sollte den Kater füttern (cf. (13a))
the Karl should the cat feed
'Karl should feed the cat'

[9] The theory of a clause-final verbal trace originated in the 20's of the 19th century in the work of the same authors who developed the first systematic theory of coordination and subordination (embedding). See Höhle (1986) for historical remarks.

d. gesungen – hat Karl häufig (cf. (14a))
sung has Karl often
'Karl often sang'

e. da – hat sie dir schon von erzählt
there has she you already of told
'she already told you about that'

Moreover, in varieties of German that make use of 'long extractions' the K-position serves as a landing site for long extracted expressions of just the same types:

(46) a. den Vorschlag – glaube ich nicht, daß viele unterstützen
the proposal believe I not that many support
'I do not believe that many support the proposal'

b. den Kindern – hoffen wir, daß Karl ein Buch zeigt
the children hope we that Karl a book shows
'we hope that Karl shows a book to the children'

c. der Karl – denke ich, daß den Kater füttern sollte
the Karl think I that the cat feed should
'I think that Karl should feed the cat'

d. gesungen – fürchte ich, daß Karl häufig hat
sung fear I that Karl often has
'I am afraid that Karl often sang'

e. da – behauptet Karl, daß sie dir schon von erzählt hat
there claims Karl that she you already of told has
'Karl claims that she already told you about that'

(In these examples the embedded clauses introduced by *daß* 'that' are situated in the Y-field of their matrix clauses.) From (45) and (46) we must conclude that the K-position is a Ā-position and that the constituent which occupies the K-position Ā-binds a trace in its original position. In (45b), for example, the indirect object *den Kindern* '(to) the children' that occupies the K-position certainly is a dislocated constituent, its normal position being in the X-field after the subject. So, we have to assume that there is a trace in X that is Ā-bound by *den Kindern*, as in (47):

(47) [den Kindern]$_i$ [zeigt$_j$ [Karl t_i ein Buch – t_j]]
K [FIN [X – VK]]

Embedded clauses typically (but not invariably) are 'verb-final'; they conform to the (simplified) topological scheme (48):

(48) CMP – X – VK – Y

where the CMP-field in Standard German is very similar to what used to be called the 'COMP-position' in English (except that in finite clauses CMP cannot be empty), and where X, Y and VK are characterized exactly as in (39). Of course, VK cannot in general be empty here, since there is no other position in the clause that a finite verb could move to. Here again coordination data such as (49) lead to the conclusion that "X – VK" is a constituent:

(49) a. daß [weder [Maria arbeitet] noch [Hanna nachdenkt]] (cf. (3b))
that neither Maria works nor Hanna meditates

b. welchen Vorschlag [[viele unterstützen] und [kaum einer ablehnt]]
which proposal many support and hardly one rejects
(cf. (7b))

Clearly there is a phrasal Ā-position (exactly one such position) in the CMP-field that serves as a landing site for (short or long) extractions, (49b) being an instance of short extraction of a direct object. The structure of a simple (non-coordinate) example of this type is accordingly as shown in (50):

(50) [welchen Vorschlag]$_i$ [viele t_i – unterstützen werden] (cf. (8b))
which proposal many support will
CMP [X – VK]

Summarizing these observations (and ignoring the Y-field), 'verb-second' clauses are structured as in (51a) and 'verb-final' clauses are structured as in (51b):

(51) a. $[_\alpha$ K $[_\beta$ FIN $[_\gamma$ X VK]]]
b. $[_\delta$ CMP $[_\varepsilon$ X VK]]

As to the category types, we certainly may identify δ with S′, where presumably S′ = C^{max}. It is plausible to assume that $\varepsilon = \gamma$ = S, but it is not obvious whether S = I^{max} or S = V^{max} with the subject position a daughter of V^{max}. We may naturally assume that β and α are projections of FIN, but again it is not obvious whether FIN = C^0 (so that $\beta = C^1$ and $\alpha = C^{max} = \delta$) or rather FIN = I^0, in any of the current conceptions of I (so that $\beta = I^1$ and $\alpha = I^{max}$, but certainly $\alpha \neq \gamma$), or even FIN =

CONFL^0, i.e., the unification of I^0 and C^0.[10] FIN is a Ā-position such that a verb in FIN binds a trace in the VK-field of its own clause. K is a Ā-position, and there is a phrasal Ā-position in the CMP-field. They both serve as landing sites for (short or) long extractions such that the extracted expression binds a trace in some S (= $\gamma = \varepsilon$).[11]

3 On Ā-binders

We will now have a look at constituents occupying a Ā-position, specifically, the K-position and the FIN-position of German declaratives. We will see that some of them behave as if they occupied the position of the trace they bind.

[10] If FIN = I^0, (51b) should perhaps be replaced by (i), with I^0 empty, as suggested by Kathol (1989) (cf. Höhle 1990):

(i) [$_\delta$ CMP [$_{\text{I}^{\max}}$ I^0 [$_\varepsilon$ X VK]]]

[11] There are also Ā-positions in the X-field, such as the positions of *da* (extracted from a PP whose remnant is *von*, cf. (45e) and (46e)) in (i):

(i) a. sicherlich – hat – da mein Kollege schon jemand von – erzählt
certainly has there my colleague already someone of told
K – FIN – X – VK
'my colleague certainly told someone about that already'

b. ob – mein Kollege da schon jemand von – erzählt hat
whether my colleague there already someone of told has
CMP – X – VK
'whether my colleague told someone about that already'

However, Ā-positions in X, as opposed to the Ā-position in CMP and to K, do not serve as landing sites for long extractions; i.e., they conform to the properties that are characteristic of 'clitic-movement' (cf. Aoun 1985).

It appears that reflexives and weak pronouns may also undergo clitic-movement. Just like A-binders, they are not subject to the CSC/ATB, even though they Ā-bind a trace:

(ii) a. wenn Karl sich$_i$ weder [t_i um die Kinder kümmert] noch [seine Arbeit
if Karl -self neither about the children worries nor his work
erledigt]
executes
'if Karl neither sees to the children nor does his work'

b. daß mich$_i$ jeder [t_i nur anstarrt] und [mir nicht hilft]
that me every only stares-at and me not helps
'that everyone only stares at me and does not help me'

3.1 Scope

3.1.1 True quantifiers

Consider an example with a quantified NP in the K-position such as (52), read with normal (falling) declarative intonation:

(52) alle Politiker haben nicht zugehört
all politicians have not listened

It means: 'For all politicians x, x did not listen'; i.e., the negator *nicht* 'not' is in the scope of the quantified NP *alle Politiker* 'all politicians'. This is just as we would expect, given that in German scope relations are typically determined by the s-command relations[12] at S-structure. See Jacobs (1982; 1983) and Pafel (1988) for ample demonstration and discussion.[13]

The scope relations are reversed, however, under 'I-Topic intonation', i.e., when a special bipartite intonation pattern is used such that there is rising intonation on a first stressed constituent (indicated by "/") and falling intonation on a second stressed constituent (indicated by " \ "), as in (53):[14]

(53) ALLE / Politiker haben NICHT \ zugehört

This means: 'It is not the case that all politicians listened'; i.e., *alle Politiker* is in the scope of the negator. This reversal of scope cannot be accounted for by assuming that with I-Topic intonation *nicht* is raised at LF so that it s-commands the K-position. Compare (54a) and (54b):

[12] In a tree T, α s-commands β if and only if β is contained in a sister of α. The only difference between s-command and c-command (under its most usual definition, where it is the converse of 'in construction with' (Klima 1964: 294)) resides in the 'first branching node' condition that is built into c-command. That condition has never been argued for, and in those few cases where it has a chance to apply nontrivially, it appears to have unfelicitous consequences.

[13] It is often argued that examples such as (i) falsify the claim that in the unmarked case scope is determined by s-command at S-structure, in that (i) has a reading with *someone* outside the scope of *everyone*:

(i) everyone loves someone

While the observation is correct, it does not show that there is an ambiguity of scope. What is at stake here, rather, is the specific reading versus the non-specific reading of the indefinite NP, and the specific reading cannot be adequately represented by the mechanisms of quantifier scope. See Kasher & Gabbay (1976) and Fodor & Sag (1982) for discussion.

[14] Jacobs (1982) introduced the term 'I-Topikalisierung' for the intonation pattern under discussion, where "I" is short for 'intonation'.

(54) a. ALLE \ Politiker hat so mancher nicht verstanden
all politicians has such some not understood
'for all politicians x, there are several people y such that it is not the case that y understood x'
(∀x ∃y NEG)

b. ALLE / Politiker hat so mancher NICHT \ verstanden
'there are several people y such that it is not the case that, for all politicians x, y understood x'
(∃y NEG ∀x)

In (54a) as well as in (54b) the indefinite *so mancher* 'several people' is outside the scope of *nicht* 'not'. In (54a) *alle Politiker* has widest scope (over *so mancher* and over *nicht*); in (54b) it has narrowest scope (*so mancher* and *nicht* are outside its scope). If *nicht* were raised, we would get the reading 'it is not the case that, for all politicians x, there are several people y such that y understood x' (NEG ∀x ∃y). But this is not the reading of (54b); rather, (54b) is synonymous with (55):

(55) es hat so mancher nicht alle Politiker verstanden
'several people did not understand all politicians'
(∃y NEG ∀x)

It is not true, then, that the scope reversal that we observe with I-Topic intonation is a result of LF raising.

Neither is I-Topic intonation by itself able to induce scope reversal. Consider (56), where the quantified NP bearing rising intonation is not in the K-position but in the X-field:

(56) trotzdem haben ALLE / Politiker NICHT \ zugehört
still have all politicians not listened
'it is still the case that, for all politicians x, x did not listen'

To the extent that (56) is acceptable at all, only the normal scope relations in accordance with s-command are available. Although the intonation and the linear precedence relations are the same in (56) and (53), no reversed scope interpretation is available.

There is, of course, one obvious difference between (53) and (56): in (53) *alle Politiker* Ā-binds a trace in the X-field, whereas there is no reason to assume that it does in (56). Hence I will assume that (57) is true:

(57) With I-Topic intonation a quantified expression E1 that bears rising intonation is in the scope of exactly those expressions E2 that have scope over a trace *t* that is Ā-bound by E1 (for E2 ≠ E1).

We may naturally assume that (53) has the structure (58a) and that (54b) has the structure (58b):

(58) a. [ALLE Politiker]$_i$ [haben [NICHT t_i zugehört]]
b. [ALLE Politiker]$_i$ [hat [so mancher [NICHT t_i verstanden]]]

In both cases t_i is s-commanded by, and in the scope of, *nicht*; hence the Ā-binder *alle Politiker* is in the scope of *nicht* too.

There might also be another possible analysis. Suppose that scope can be extended upwards so that the primary s-command domain is properly included in the extended scope domain, as long as the extension does not include any expression that is sensitive to scope. For example, the extended scope domain of *nicht* in (59) will include the definite NPs *du* 'you' and *den Hund* 'the dog', although they are not s-commanded by *nicht*:[15]

(59) vielleicht hast du den Hund nicht gehört
perhaps have you the dog not heard
'perhaps you did not hear the dog'

Assume furthermore that a Ā-bound trace behaves like a definite NP in that it can lie in an extended scope domain. Cf. Basri & Finer (1987), who argue on morphological grounds for the definiteness of trace. Under this assumption (58) may be replaced by (60):

(60) a. [ALLE Politiker]$_i$ [haben [t_i [NICHT zugehört]]]
b. [ALLE Politiker]$_i$ [hat [so mancher [t_i [NICHT verstanden]]]]

[15] It is a remarkable fact that indefinite non-specific NPs can lie in an extended scope domain, as in (iB), although they are evidently sensitive to scope, provided they are contextually 'given' (explicitly or by implicature):

(i) A: wir müßten einen Zuschuß haben
we should a grant have
'we should have a grant'

(ii) B: ich bin sicher, daß ihr einen Zuschuß gar nicht benötigt
I am sure that you a grant not need
'I am sure that you are not in need of a grant'

Now the trace t_i can be considered to be in the (extended) scope of *nicht*, hence, by (57), *alle Politiker* is in the scope of *nicht*.

There is evidence that some mechanism like this must indeed be available in German. Jacobs (1980) exemplified and discussed in detail examples such as (61):

(61) a. ALLE / Lehrer haben mir KEIN \ Buch empfohlen
all teachers have me no book recommended
'it is not the case that all teachers recommended a book to me'
(NEG ∀x ∃y)

b. BEIDEN / Ärzten sollte Luise KEINE \ Spieldose vermachen
both doctors should Luise no musical box will
'Luise should not will a musical box to both doctors'
(NEG 2x ∃y)

Here the phrases *alle Lehrer* 'all teachers' and *beide Ärzte* 'both doctors' are understood to be in the scope of negation. Yet, this cannot be accounted for by giving maximal scope to the negatively quantified phrases *kein Buch* 'no book' and *keine Spieldose* 'no musical box'. This would give us the readings 'there is no book that all teachers recommended to me' (NEG ∃y ∀x) and 'there is no musical box that Luise should will to both doctors' (NEG ∃y 2x), and these readings are unavailable for (61). At the same time the reading that (61) has is not available in (62) (with or without I-Topic intonation):

(62) a. mir haben alle Lehrer kein Buch empfohlen
'for all teachers x, x did not recommend a book to me'
(∀x NEG ∃y)

b. Luise sollte beiden Arzten keine Spieldose vermachen
'for both doctors x, Luise should not will a musical box to x'
(2x NEG ∃y)

Hence it appears necessary to assume that in (61) the negation contained in the negatively quantified NP extends its scope over a trace to its left:

(63) a. [ALLE Lehrer]$_i$ [haben [mir t_i [KEIN Buch empfohlen]]]
b. [BEIDEN Ärzten]$_i$ [hat [Luise [t_i [KEINE Spieldose vermacht]]]]

There is also some doubt whether the structures given in (58) can be adequate for (53) and (54b). Pafel (1989) observed that examples such as (64) are bad although their presumed 'sources' (65) are unobjectionable:

(64) a. ?? VIELE / Schwestern bewundern NICHT \ den Arzt
many nurses adore not the doctor
b. ?? ALLE / haben NICHT \ einen Hund gesehen
all have not a dog seen

(65) a. trotzdem bewundern nicht viele Schwestern den Arzt
'still, not many nurses adore the doctor'
b. trotzdem haben nicht alle einen Hund gesehen
'still, not everyone saw a dog'

This is difficult to understand if (58) is correct. But it can be accounted for if we make two assumptions. First, the focal NP of a focus sensitive logical element (such as negation and scalar particles) can never be extracted out of this element's s-command domain; hence (64) cannot 'derive' from structures such as (65), but only from structures such as (66):

(66) a. trotzdem bewundern viele Schwestern nicht den Arzt
b. trotzdem haben alle nicht einen Hund gesehen

Second, the placement of *nicht* before the objects as in (66) is felicitous only if its s-command domain contains a focal NP. This condition is not observed in (64). I assume, therefore, that the structures (60) and (63) are the only correct ones.

3.1.2 Indefinites and clauses

Consider an example with an indefinite NP in the K-position such as (67), read with normal declarative intonation:

(67) ein Politiker hat nicht zugehört
a politician has not listened

This has a reading where the NP is in the scope of the negation *nicht*: 'It is not the case that a politician listened'. Similarly for (68):

(68) einen Politiker haben viele Leute verehrt
a politician have many people adored

Here the indefinite NP *einen Politiker* 'a politician' can be understood to be referentially dependent on (i.e., in the scope of) *viele Leute* 'many people': 'there were many people who adored a politician'. The S-structures of (67) and (68) can be assumed to be as shown in (69):

(69) a. [ein Politiker]$_i$ [hat [t_i [nicht zugehört]]]
b. [einen Politiker]$_i$ [haben [viele Leute [t_i verehrt]]]

In these readings, then, the scope relations that the phrase in the K-position enters into are determined by the position of the trace that it Ā-binds.

Indefinite NPs, however, differ significantly from quantified NPs with regard to the role played by intonation. The scope relations of truly quantified NPs seem to be unambiguous. With normal intonation they are strictly determined by their S-structure position, as in (52) and (54a). With I-Topic intonation they are determined by the position of their trace, as in (53), (54b) and (61). But the scope relations of indefinite NPs are ambiguous with normal intonation: there is one scope reading determined by the position of their trace, as in (67) and (68); and there is another scope reading determined by their S-structure position, such that they are outside the scope of any element s-commanded by them.[16]

Sometimes it is not obvious a priori whether a given NP should be expected to behave like a quantified NP as in (52) or rather like an indefinite NP as in (68). Consider (70), read with normal declarative intonation:

(70) viele Politiker haben die meisten nicht verstanden
many politicians have the most not understood

This has a reading with *viele Politiker* 'many politicians' in the scope of *die meisten* 'most people' and outside the scope of the negation: 'For most people x there are many politicians y such that x did not understand y' (MOSTx MANYy NEG). Hence, the scope relations are determined according to the position of the trace:

(71) [viele Politiker]$_i$ [haben [die meisten [t_i nicht verstanden]]]

(The negation can extend its scope over the trace, but it need not.)
Similarly for (72):

(72) vielen Politikern ist auch KARL nicht begegnet
many politicians is even Karl not met

This has a reading with *vielen Politikern* in the scope of *auch Karl* 'even Karl' and the negation: 'Even Karl did not meet many politicians'. Here we may assume that the trace is in the extended scope of *nicht*:

(73) [vielen Politikern]$_i$ [ist [auch KARL [t_i nicht begegnet]]]

[16] This seems to be a genuine ambiguity of scope, independent of the specific/non-specific ambiguity. See Pafel (1988) for arguments to this effect.

Ordinarily NPs of the form "*viele (N)*" 'many (N)' are thought to be truly quantified, but here we can see that they behave like indefinites.[17] This observation is corroborated by left dislocation structures. Definite NPs as well as indefinite NPs can participate in such constructions, whereas truly quantified NPs are strictly excluded:[18]

(74) a. deinen Vorschlag, den versteht keiner
your proposal the understands no
'no-one understands your proposal'

b. einen Porsche, den hat sie früher mal besessen
a Porsche the has she earlier once owned
'earlier, she owned a Porsche'

c. wilden Tieren, denen gehe ich aus dem Weg
wild animals the go I out the way
'I avoid wild beasts'

(75) a. * jedes wilde Tier/jedem wilden Tier, dem gehe ich aus dem Weg
'I avoid every wild beast'

b. * kein Vorschlag/keinen Vorschlag, den verstehe ich
'I do not understand any proposal'

c. * fast alle Leute, die mußte ich nach Hause schicken
'I had to send away almost all people'

But *viele (N)* does occur in left dislocation:

(76) a. viele Vorschläge, die verstehe ich nicht
'there are many proposals that I do not understand'

b. viele Leute, die mußte ich wegschicken
'there are many people that I had to send away'

c. viele Lehrer/vielen Lehrern, denen gehe ich lieber aus dem Weg
'there are many teachers that I rather avoid'

[17] This has been independently observed by Pafel (1989). Example (70) is adapted from him.

[18] This fact is important for the general theory of scope reversal. According to Kiss (1987) scope reversal in Hungarian is dependent upon an intonation pattern that seems to be very similar to I-Topic intonation in German. She argues that in Hungarian this is an instance of left dislocation, implicating that this assumption may somehow contribute to an explanation of scope reversal. But while it is true that left dislocation shows various 'connectedness phenomena', scope reversal with quantified NPs as in (53) and (54b) cannot be an instance of left dislocation in German, given that quantified NPs are not allowed in left dislocation structures.

Hence, *viele (N)* cannot be considered to be necessarily quantificational in the way that *jed-/kein-/alle (N)* 'every/no/all (N)' are. In those cases where *viele (N)* does show distributive effects, as in (68), this may be caused by the plural, just as plural definites can be distributive:

(77) die Leute benutzten ein Stäbchen zum Essen
'the people used a chopstick for eating'

A similar question arises with regard to clauses in the K-position. The preposed clause in (78) contains the negative polarity item *jemals* 'ever' that is bound to be in the scope of the negation:

(78) a. daß du jemals so etwas tun könntest, hat manch einer nicht
that you ever such some do could has many one not
geglaubt
believed
'many did not believe that you would ever be able to do something like that'

b. [daß du jemals so etwas tun könntest]$_i$ [hat [manch einer [t_i nicht geglaubt]]]

Although there does not seem to be any a priori reason to expect this, complement clauses seem to behave like indefinite NPs in that they may enter into scope relations according to the position of the trace bound by them, without the help of I-Topic-intonation.

3.1.3 Verbs

It has often been observed that finite verbs in the FIN-position behave exceptionally with regard to scope. When the finite verb is in VK, as in (79), scope is assigned in accordance with the usual s-command condition:

(79) daß Karl irgendjemand kein Buch zeigen möchte
that Karl someone no book show wants
'that there is a person x such that Karl does not want to show a book to x'

The indefinite *irgendjemand* 'someone' is outside the scope of the negatively quantified NP *kein Buch* 'no book', and in the reading considered here, *möchte* 'wants' is in the scope of the negation. Remarkably, in a corresponding clause with the finite verb in FIN, exactly the same scope relations are found:

(80) Karl möchte irgendjemand kein Buch zeigen

That is, *kein Buch* still has scope over *möchte* but does not have scope over *irgendjemand*. This is less surprising, though, than it seems to be, since we know (i) that the verb in FIN Ā-binds a trace in VK, and (ii) that scope relations may be determined by the position of such a trace:

(81) Karl [möchte$_i$ [irgendjemand kein Buch zeigen t_i]]

This effect is independent of intonation.[19]

One might entertain the assumption (i) that the scope relations of the verb are determined at D-structure, not S-structure; or (ii) that movement of the verb to the FIN-position is a PF phenomenon. However, there is rather direct evidence from Verum focus ('polarity focus') that both assumptions are incorrect. Under appropriate contextual conditions, stress on the finite verb in the FIN-position, as in (82), can be understood to emphasize that the assertion is true:

(82) er HÖRT mir zu
he hears me to
'he does listen to me'

This effect is absent when the finite verb is in VK, as in (83):

(83) a. du siehst doch, daß er mir zuHÖRT
you see that he me to-hears
b. du siehst doch, daß er mir ZUhört

In (83a), *zuHÖRT* 'listens' may be in contrast to *zuSTIMMT* 'agrees'; in (83b), *ZUhört* may be in contrast to *WEGläuft* 'runs away'. But neither of them can have an effect even remotely similar to (82). I assume, therefore, that the FIN-position is associated with a meaning component symbolized by "VERUM". By stressing phonetic material (i.e., the verb) in FIN that component can be emphasized. Importantly, the Verum component can be in the scope of a negation to its right. In a context such as (84a) an utterance of (84b) can have the effect of an emphatic denial of the truth of (84c):

(84) a. wir hoffen, daß dir alle zuhören
'we hope that everyone listens to you'

[19]It would be natural, therefore, to assume that this effect is optional, and so it seems indeed to be in certain cases. In general, however, it appears to be obligatory. An example such as (i) apparently cannot have the meaning of (ii), but must be understood as in (iii):

(i) Karl füttert den Hund nicht
Karl feeds the dog not

(ii) There is a relation of feeding such that it does not hold between Karl and the dog.

(iii) There is no relation of feeding such that it holds between Karl and the dog.

b. aber es HÖRT mir keiner zu
but it hears me no to
'but no-one does listen to me'

c. es hört mir jemand zu
'someone listens to me'

As VERUM is associated with FIN and FIN is not s-commanded by *keiner* 'no-one', we must assume that VERUM is in the scope of negation by virtue of the fact that the verb in FIN Ā-binds a trace that is s-commanded by negation. Cf. Höhle (1988).

We may extend these observations by considering verb projections in the K-position. In (85) the indefinite *einen Hund* 'a dog' is referentially dependent on *viele Kinder* 'many children':

(85) einen Hund gefüttert haben viele Kinder
a dog fed have many children
'many children fed a dog'

Similar observations hold with regard to negation. In (86) the negative polarity item *jemals* 'ever' must be in the scope of the negatively quantified phrase *keiner von euch* 'none of you':

(86) jemals gearbeitet hat wohl keiner von euch
ever worked has presumably no of you
'presumably none of you has ever worked'

The structures shown in (87) allow these observations to be accounted for by the assumption that the verb projections are in the scope of those expressions that s-command their trace:

(87) a. [einen Hund gefüttert]$_i$ [haben [viele Kinder t_i]]
b. [jemals gearbeitet]$_i$ [hat [wohl keiner von euch t_i]]

3.2 A-binding

The observations that we have made with regard to scope assignment are paralleled by observations concerning A-binding. In order to appreciate the data to follow it is important to recognize that 'binding' – specifically A-binding – as used here is an undefined notion the elucidation of which is a topic of current research. By its very nature binding is an irreflexive asymmetric relation, and it is an open question whether it should be construed as being transitive. Although the device of coindexing, a symmetric and transitive relation by definition, is a truly misleading means of representing binding relations, I will use it in the conventional way.

3.2.1 Overt anaphoric expressions

Consider an example with a verb projection in the K-position containing a reflexive:

(88) a. sich rasieren sollte sie
-self shave should she
'she should shave herself'
b. [sich$_i$ rasieren]$_j$ [sollte$_k$ [sie$_i$ [t$_j$ t$_k$]]]

The reflexive *sich* '-self' (3rd person, no gender or number distinctions) is understood as being A-bound by *sie* 'she', although it is not s-commanded by its antecedent. The usual formulations of the binding theory, relying strictly on s-command, cannot account for a case like (88) at S-structure. We note, however, that *sich* is bound by an antecedent that s-commands the trace that is Ā-bound by *sich rasieren*, as shown in (88b).

In (89a) the reflexive *sich* in the K-position (to which the emphatic particle *selbst* 'self' may be added) is A-bound by an antecedent that s-commands the trace that is Ā-bound by the reflexive:

(89) a. sich (selbst) sollte sie rasieren
-self (self) should she shave
'she should shave herself'
b. [sich (selbst)]$_i$ [sollte [sie$_i$ [t_i rasieren]]]

Note that this configuration is different from a strong crossover configuration (which will be discussed in Section 6.1). The reflexive must be bound, and *sie* is the only possible antecedent. From the asymmetry of binding it follows that *sie* cannot be bound by *sich*, hence there is no chance for a strong crossover effect to ensue.

In (90) and (91) we observe A-bound possessives:

(90) a. seinen Hund gefüttert hat wohl keiner
his dog fed has presumably no
'presumably, no-one fed his dog'
b. [seinen$_i$ Hund gefüttert]$_j$ [hat$_k$ [wohl keiner$_i$ [t_j t_k]]]

(91) a. seinen Hund hat wohl keiner gefüttert
his dog has presumably no fed
'presumably, no-one fed his dog'
b. [seinen$_i$ Hund]$_j$ [hat [wohl keiner$_i$ [t_j gefüttert]]]

Under the relevant reading the possessive *seinen* 'his' is A-bound by *keiner* 'no-one', which s-commands the trace of the phrase that contains the possessive.

The same configuration is found in complement clauses:

(92) a. zugeben, daß er krank ist, würde wohl keiner
admit that he ill is would presumably no
'presumably, no-one would admit that he is ill'

b. [zugeben, daß er$_i$ krank ist]$_j$ [würde$_k$ [wohl keiner$_i$ [t_j t_k]]]

(93) a. daß er krank ist, würde wohl keiner zugeben
that he ill is would presumably no admit
'presumably, no-one would admit that he is ill'

b. [daß er$_i$ krank ist]$_j$ [würde [wohl keiner$_i$ [t_j zugeben]]]

Under the relevant reading *er* 'he' is A-bound by *keiner*, which again s-commands the trace of the phrase that contains the bound pronoun.

3.2.2 Pronominal coreference

Let us try to replace the binding relations seen in (88)–(93) by coreference:

(94) a. [den Kerl dort drüben]$_i$ rasieren sollte er$_j$
'shave the guy over there, he should'

b. [den Kerl dort drüben]$_i$ sollte er$_j$ rasieren
'the guy over there, he should shave'

(95) a. den Hund von [dem Kerl dort drüben]$_i$ gefüttert hat er$_j$ selten
'feed the dog of the guy over there he seldom has'

b. den Hund von [dem Kerl dort drüben]$_i$ hat er$_j$ selten gefüttert
'the dog of the guy over there he seldom fed'

(96) zugeben, daß [der Kerl dort drüben]$_i$ krank ist, würde er$_j$ kaum
'admit that the guy over there is ill, he hardly would'

The examples are perfectly grammatical, and since pronouns usually pick up a referent introduced earlier in the text, we would expect that the pronoun *er* 'he' may be understood as being coreferential with the definite NP *d- Kerl dort drüben* 'the guy over there' to its left. But this reading is as difficult to get here as it is in (97):

(97) a. trotzdem sollte er$_j$ [den Kerl dort drüben]$_i$ rasieren

b. trotzdem hat er$_j$ den Hund von [dem Kerl dort drüben]$_i$ gefüttert

c. trotzdem würde er$_j$ kaum zugeben, daß [der Kerl dort drüben]$_i$ krank ist

In (97) well-known restrictions against coreference make a disjoint reference reading nearly obligatory (i.e., $i \neq j$). Obviously the same is true of (94)–(96). It appears, then, that with verb projections and definite NPs in the K-position coreference relations are obligatorily computed with respect to the trace that is Ā-bound by them.

With clauses the situation is slightly different. While (93) shows that binding in accordance with the position of the trace is possible, coreference is not excluded in the same configuration:

(98) (?) daß [der Kerl dort drüben]$_i$ krank ist, würde er$_i$ kaum zugeben
'that the guy over there is ill, he would hardly admit'

While judgements vary somewhat, there is no doubt that a coreference reading is far more accessible here than in examples like (96).

3.2.3 Empty categories

Given that A-binding of non-empty anaphoric expressions may involve the position of a Ā-bound trace, we may expect empty categories to behave similarly.

There is in fact evidence in English that traces of 'NP-movement' (passive and subject-to-subject raising) may be bound by an antecedent they are not s-commanded by, as long as they are lexically governed (data from Thiersch (1985) and personal communication):

(99) a. [criticized t_i by his boss]$_j$ John$_i$ has never been t$_j$
b. [likely t_i to succeed]$_j$ though John$_i$ may be t_j
c. [likely t_i to be fired t'_i]$_j$ John$_i$ certainly is t_j

In each case t_i is A-bound by *John*. This is possible because *John* s-commands t_j, which is Ā-bound by the phrase containing t_i.[20] Equivalent examples can be found in Italian:[21]

[20]However, M. Baltin (cited by Saito (1989: 199)) observed that in raising structures the binder cannot be a non-argument:

(i) a. *[how likely t_i to be a riotl$_j$ is there$_i$ t_j
b. *[how likely t_i to be taken t_i of John]$_j$ is advantage$_i$ t_j

This seems also to be true of pure passive structures:

(ii) a. *[made t_i by John]$_j$ [considerable headway]$_i$ has been t_j
b. *[kept t_i on John]$_j$ though tabs$_i$ will be t_j

It appears, then, that the preposed phrase must be a predicative category (assign an external θ-role), for reasons unknown.

[21]In this paper, Italian data are taken from Longobardi (1985).

(100) [tradito t_i da sua moglie]$_j$ [credo che Mario$_i$ non sia mai stato t$_j$]
'betrayed by his wife, I believe that Mario has never been'

Traces of clitic-movement behave just the same:

(101) [offerte t_i a sua moglie]$_j$ [credo che Mario ancora non le$_i$ abbia t$_j$]
'offered t_i to his wife, I believe that Mario them$_i$ has not yet'

Although such traces are Ā-bound by their antecedent (t_i is Ā-bound by *le*), they are known to comply with the conditions on A-bound traces (Aoun 1985). Therefore (101) does not come as a surprise, given that (100) is possible.

In German there is at least one obvious candidate for 'clitic-movement', viz., structures such as (102a) related to (102b):

(102) a. er hat da$_i$ oft [t_i von] gesprochen
he has there often of spoken
'he often talked about that'
b. er hat oft davon gesprochen

Cf. note 11. Whereas *davon* 'there-of' can be contained in a phrase in the K-position (103), the trace of *da* cannot (104):

(103) a. [davon gesprochen]$_i$ [hat er oft t_i]
thereof spoken has he often
b. davon$_i$ [hat er oft t_i gesprochen]

(104) a. ?* [[t_j von] gesprochen]$_i$ [hat er da$_j$ oft t_i]
b. * [t_j von]$_i$ [hat er da$_j$ oft t_i gesprochen]

I assume that the trace t in (102a) is not lexically governed but antecedent-governed. If this is correct, we may assume that t_j in (104) fails to be antecedent-governed (whereas t_i in (101) is lexically governed). This would mean, then, that for antecedent-government to be possible, binding must be determined by s-command at S-structure.

Italian allows extraction much more freely than English. It thereby offers an opportunity to observe the behaviour of Ā-bound traces. As it turns out, traces of *wh*-movement (105) and topicalization (106) must be s-commanded by their antecedent at S-structure:[22]

[22] In this respect so-called scrambling in Japanese (at least, non-local scrambling) behaves like *wh*-movement and topicalization in Italian; see Saito (1989: 190). Note that scrambling in Japanese (as opposed to 'scrambling' in German) also behaves as *wh*-movement does in some variants of English with respect to A-binding, discussed in Section 6.3; see references in note 31.

(105) * [a sposare t_i]$_j$ [non so proprio [[quale ragazza]$_i$ [Gianni sarebbe disposto t_j]]]

'to marry t_i, I really do not know [which girl]$_i$ Gianni would be ready'

(106) * [a comprarti t_i per il compleanno]$_j$ [penso [che [solo questo regalo]$_i$ [potrei convincere tua moglie t_j]]]

'to buy you t_i for your birthday, I think that [only this present]$_i$ I might be able to persuade your wife'

But in the same configuration parasitic gaps are much better:

(107) ? [senza conoscere e_i prima bene]$_j$ [non so proprio [[quale altra ragazza]$_i$ [Gianni sarebbe disposto a sposare t_i t_j]]]

'without knowing e_i well beforehand, I really do not know [which other girl]$_i$ Gianni would be ready to marry t_i'

This differential behaviour of *wh*-traces and parasitic gaps poses important questions which will be taken up in Section 6.4.

4 Reconstruction

We have seen that in a number of cases scope assignment and binding of expressions contained in a phrase that Ā-binds a trace may or must consider the position of the trace. How can these facts formally be accounted for?

As to the observations on scope, it seems natural to account for them by mechanisms used in the translation from the syntactic form into a semantic representation. Suppose that a constituent containing a Ā-bound trace is translated in such a way that a variable replaces the trace and a lambda operator binds the variable, as in (108):

(108) a. XP_i [... YP ... t_i ...]

b. XP'_σ λ Z_τ (... YP′ ... Z_τ ...)

In the semantic representation (108b) the Ā-binder XP is represented by an expression XP′ of type σ, and the variable Z corresponding to the trace is of type τ. If σ is a higher type than τ, XP′ will have scope over the lambda expression; if $\sigma = \tau$, YP′ will have scope over XP′. Depending on properties of XP and on intonation, the translation mechanism will fix τ equal to σ or lower than σ.

Unfortunately this simple idea cannot account for the observations on binding, for elementary reasons. If XP contains an expression that is understood to be bound by YP and XP is translated in the usual way, i.e., without taking YP

into account, then XP′ will contain a free variable that cannot become bound by lambda conversion; cf. Engdahl (1986: 29-32). At the same time it seems obvious that the grammatical principles governing scope and binding are essentially similar. That is, in those cases where the position of the trace must be considered in order for the trace binder to be treated properly, the trace cannot be evaluated by lambda conversion. Rather there must be a different mechanism that is able to account for scope as well as for binding.

The question of how to adequately account for binding phenomena of the kind we have discussed has a long history. One traditional answer is that A-binding relations must be determined at a level (or: at levels) of representation more abstract than S-structure (and surface structure). Proposals differ as to how this level is to be characterized precisely. For concreteness, we may define a level of R-structure as in (109):

(109) *R-structure:*

i. The theories of scope and A-binding apply only at R-structure.

ii. If at S-structure some phrase D occupies a Ā-position Pa and binds a trace *t* in an A-position Pb, then at R-structure a representation of D may occupy Pb while Pa is empty. Otherwise, R-structure and S-structure are identical.

iii. Clause (ii) is subject to certain conditions to be specified separately.

If a phrase D is in position Pb at R-structure while it is in position Pa at S-structure, according to clause (ii), I will say that D is 'reconstructed'. (In a moment, "reconstruct" will acquire a second, though related, meaning.) The conditions that (109ii) is subject to may then be tentatively stated as in (110):

(110) *Conditions on reconstruction:*

i. Indefinite NPs and clauses are optionally reconstructed.

ii. Verbs and verb projections are obligatorily reconstructed.

iii. Definite NPs are obligatorily reconstructed.

iv. Truly quantified expressions are reconstructed if and only if they bear rising intonation within an I-Topic intonation pattern.[23]

v. There is no other case of reconstruction.

[23] The fall must be on a scope inducing expression (scalar particle, negation, distributive quantifier, etc.) or on the focus of such an expression, as in (i):

(i) JEDEN / Hund hast auch DU \ dem Kater nicht zeigen können
every dog have even you the cat not show can
'even you were not able to show every dog to the cat'

Here *du* 'you' is the focus of the scalar particle *auch* 'even'.

This set of conditions seems to give correct results over a fairly broad empirical domain, as the reader may verify by reconsidering Section 3. Naturally there remain many questions of descriptive detail on the one hand, and of theoretical rationalization on the other, which we cannot follow here.[24] Rather, we will explore some consequences of an alternative account for reconstruction phenomena.

There have been various attempts to account for binding facts like those we have seen in Section 3.2 directly at S-structure. To this end, the binding theory must be modified in such a way that A-binding may be mediated somehow by a Ā-bound trace. Proposals to this effect have been made, e.g., by Guéron (1984), Roberts (1985), Williams (1986) and works cited there. For our purpose we may follow Williams's suggestion of generalizing the notion of c-command domain:

(111) *R-domain:*

i. The theories of scope assignment and binding apply at S-structure.

ii. a. In the unmarked case, X is in the domain of Y if and only if X is s-commanded by Y.[25]

b. X can be in the scope of Y or X can be A-bound by Y only if X is in the R-domain of Y.

c. If X is in the domain of Y, then X is in the R-domain of Y.

iii. If some phrase D Ā-binds a trace t and t is in the R-domain of some A (A $\neq$ D), then any B contained in D may be in the R-domain of A.

iv. Clause (iii) is subject to the conditions on reconstruction.

Note that the clauses in (ii) are simply reformulations of the standard assumptions for the normal case. Clause (iii) corresponds to clause (ii) of (109). Accordingly, if a phrase D is in the R-domain of A according to (111iii) I will say that D is 'reconstructed'. Hence the conditions (110) apply in this case. To distinguish between the two senses of "reconstruct", I will speak of 'true reconstruction' in the case of (109) and of 'pseudo-reconstruction' in the case of (111).

As it stands, (111) is not exactly equivalent to (109) as long as the characterization of the Opacity Domain (OD, or Governing Category or Binding Category) for A-binding is not modified accordingly. Without such a modification ungrammatical examples such as (112) and (113) would be admitted alongside with their grammatical counterparts (114) and (115):

[24] This remark applies in particular to the treatment of coreference, which on the whole is much less straightforward than Section 3.2.2 makes it appear.

[25] The extension of the scope domain of negation that we observed in (61) and (63) is an exception to the unmarked case. Other types of exceptions will be discussed in Sections 6.4 and 6.5.

(112) a. * Karl$_i$ wollte wissen, welche Scherze über sich$_i$ ich liebe
Karl wanted know which jokes about -self I love
'Karl wanted to know which jokes about him(self) I like'

b. * sich$_i$ glaubt Karl$_i$, daß ich liebe
-self believes Karl that I love
'Karl believes that I like him(self)'

c. * sich$_i$ glaube ich, daß Karl$_i$ hofft, daß du liebst
-self believe I that Karl hopes that you love
'I believe that Karl hopes that you love him(self)'

(113) a. * wir wissen, welche Scherze über ihn$_i$ niemand$_i$ liebt
we know which jokes about him nobody loves
'we know which jokes about him(self) nobody likes'

b. * ihn$_i$ (selbst) meine ich, daß jeder$_i$ rasieren sollte
him (self) mean I that every shave should
'I think that everyone should shave him(self)'

(114) a. Karl$_i$ wollte wissen, welche Scherze über ihn$_i$ ich liebe

b. ihn$_i$ glaubt Karl$_i$, daß ich liebe

c. ihn$_i$ glaube ich, daß Karl$_i$ hofft, daß du liebst

(115) a. wir wissen, welche Scherze über sich$_i$ niemand$_i$ liebt

b. sich$_i$ (selbst) meine ich, daß jeder$_i$ rasieren sollte

Hence we have to revise the binding theory (for German) along the lines of (116):

(116) *Binding theory for R domains:*

i. X is the Opacity Domain (OD) of Y if and only if X is the smallest constituent that contains a SUBJECT β such that Y is in the R-domain of β.

ii. An anaphor δ must be A-bound by a phrase α that is contained in the OD of δ.

iii. A personal pronoun π must not be A-bound by a phrase α that is contained in the OD of π.[26]

[26] In German only third person pronouns are subject to (116iii). There is no OD for possessives or for first or second person pronouns. This is a natural state of affairs, as the existence of an OD for a pronominal is induced by the existence of a corresponding lexical anaphor. There are no reflexive possessives and no first or second person reflexives in German. Alternatively, possessives and first/second person pronominals may be considered to be systematically ambiguous in having the OD of a pronoun or the OD of an anaphor.

With this modification (112) and (113) are correctly ruled out, and (111) is equivalent to (109) with regard to the kind of examples we have discussed so far. We will now turn to coordination in order to see whether and how differences between true reconstruction and pseudo-reconstruction may arise there.

5 Reconstruction in coordination

5.1 Scope

Consider an example such as (117) read with normal intonation:

(117) a. fast jeden Hund hat Karl gefüttert oder hat Heinz gestreichelt
almost every dog has Karl fed or has Heinz caressed
'for almost every dog x: Karl fed x or Heinz caressed x'
b. [fast jeden Hund]$_i$ [[hat Karl t_i gefüttert] oder [hat Heinz t_i gestreichelt]]

Although *fast jeden Hund* 'almost every dog' functions as the direct object of two different verbs (and therefore binds two traces in (117b)), the phrase has scope over the entire coordinate phrase. This fact immediately confirms one aspect of the conditions on reconstruction given in (110): in accordance with (110iv), *fast jeden Hund* is not reconstructed. If it were, (117) would be synonymous with (118), at least under true reconstruction:

(118) Karl hat fast jeden Hund gefüttert oder Heinz hat fast jeden Hund gestreichelt
'Karl fed almost every dog, or Heinz caressed almost every dog'

We may conclude that also in a simple (non-coordinate) case such as (119a) there is no reconstruction, even though (119a) and (119b) are logically equivalent here:

(119) a. fast jeden Hund hat Karl gefüttert
b. Karl hat fast jeden Hund gefüttert

The situation is different in (120). This example has a reading equivalent to (121):

(120) a. einen Hund haben viele gestreichelt oder hat jeder gefüttert
a dog have many caressed or has every fed
b. [einen Hund]$_i$ [[haben viele t_i gestreichelt] oder [hat jeder t_i gefüttert]]

(121) es haben viele einen Hund gestreichelt, oder es hat jeder einen Hund
it have many a dog caressed or it has every a dog
gefüttert
fed
'many people caressed a dog, or everyone fed a dog'

That is, *einen Hund* 'a dog' in the K-position can be understood to be in the scope of both *viele* 'many people' and *jeder* 'everyone'.

In a formal sense this is predicted by true reconstruction (109) as well as by pseudo-reconstruction (111), but there is an important difference. Under true reconstruction, R-structure is the level of representation where scope and binding is determined, hence semantic interpretation proceeds off this level, and in particular the interpretation of coordinate structures proceeds from R-structure. The R-structure representation of (120) is similar to (121) in that the positions of the two traces in (120b) are each occupied by *einen Hund* in (121); hence there is one occurrence of *einen Hund* in the domain of *viele*, and there is another occurrence of *einen Hund* in the domain of *jeder*.

Under pseudo-reconstruction, semantic interpretation proceeds from S-structure. In S-structure there is just one occurrence of *einen Hund*. It is in the R-domain, hence in the scope, of *viele* and of *jeder* – but that is either nonsensical or false. The problem presents itself lucidly when we make use of Skolem functions. Suppose that *viele* is represented by the variable "x" bound by some suitable quantifier and that *jeder* is represented by the variable "y" bound by the universal quantifier. Being in the scope of *viele, einen Hund* must be represented by "$f_1(x)$"; being in the scope of *jeder*, it must be represented by "$f_2(y)$". But for the translation of one and the same expression to be represented in these two ways, it must be the case that $f_1(x) = f_2(y)$. But this is empirically false: (120) is understood in the same way as (121), i.e., $f_1(x)$ and $f_2(y)$ are independent of each other.

The same problem presents itself from a different angle in an example such as (122), which in one reading is equivalent to (123):

(122) a. einen Hund hat Karl gefüttert und hat Heinz gestreichelt
a dog has Karl fed and has Heinz caressed
b. [einen Hund]$_i$ [[hat Karl t_i gefüttert] und [hat Heinz t_i gestreichelt]]

(123) es hat Karl einen Hund gefüttert, und es hat Heinz einen Hund gestreichelt
'Karl fed a dog, and Heinz caressed a dog'

True reconstruction maps (122) into an R-structure representation similar to (123), the translation of which immediately represents the relevant reading of (122), where there may be two different dogs involved. But pseudo-reconstruction seems to be unable to generate this reading. Although (111) allows *einen Hund* to be 'reconstructed', it is not obvious which effect pseudo-reconstruction may be supposed to have in this case: *einen Hund* is neither A-bound by, nor in the scope of, any other expression. By usual assumptions the interpretation of the coordinate phrase will result in an expression roughly indicated by (124), where "x" is a variable of type e:

(124) ((HAS (FED (KARL, x))) & (HAS (CARESSED (HEINZ, x))))

Since *einen Hund* in (122) must be translated as being existentially quantified, this quantifier will have to bind both occurrences of "x" in (124). But this is not the reading we are interested in. Under the assumptions we made in Section 4 it does not seem possible to get the correct interpretation, as long as we stick to standard assumptions about how to translate coordinate structures semantically (e.g., Partee & Rooth 1983).

A particularly interesting instance of the phenomenon seen in (122) can be observed in (125), which in one reading is equivalent to (126):

(125) ein Affe hat den Hund gefüttert und hat den Kater gefüttert
an ape has the dog fed and has the cat fed

(126) ein Affe hat den Hund gefüttert, und ein Affe hat den Kater gefüttert
'an ape fed the dog, and an ape fed the cat'

That is, the ape that fed the dog need not be the ape that fed the cat. This reading is unavailable in (127):

(127) (es ist wahr) daß ein Affe den Hund gefüttert hat und den Kater
(it is true) that an ape the dog fed has and the cat
gefüttert hat
fed has
'(it is true) that there is an ape that fed the dog and fed the cat'

From an observational point of view, this difference seems surprising. But it fits naturally into the general picture, given the structures of (125) and (127) as shown in (128):

(128) a. [ein Affe]$_i$ [[hat t_i den Hund gefüttert] und [hat t_i den Kater gefüttert]]

b. daß ein Affe [[den Hund gefüttert hat] und [den Kater gefüttert hat]]

In (128b) the subject *ein Affe* is not subject to reconstruction as there is no trace that is Ā-bound by it; hence it has scope over the entire coordinate phrase. In (128a), by contrast, *ein Affe* Ā-binds two traces, and true reconstruction yields a representation that is translated into a semantic representation equivalent to the translation of (126). (Pseudo-reconstruction faces the same problem here as it did with (122), of course.)[27]

Let us finally look at (129) under the reading it shares with (130):

(129) a. einen Hund hat mancher gefüttert, aber keiner gestreichelt
a dog has some fed but no caressed
b. [einen Hund]$_i$ [hat [[mancher t_i gefüttert] aber [keiner t_i gestreichelt]]]

(130) mancher hat einen Hund gefüttert, aber keiner hat einen Hund gestreichelt
some has a dog fed but no has a dog caressed
'some people fed a dog, but no-one caressed a dog'

Here, *einen Hund* is in the scope of *mancher* 'some people' on the one hand, and in the scope of *keiner* 'no-one' on the other hand. This much is correctly predicted by true as well as by pseudo-reconstruction. But true reconstruction generates two occurrences of *einen Hund*, so that the semantic interpretation of the coordinate structure is straightforward at R-structure. Pseudo-reconstruction, by contrast, must do with one occurrence, on which it imposes conflicting demands by requiring it to be at the same time in the scope of negation and outside the scope of negation.

[27] The reading we observed in (125) is less readily available, although not impossible, in (i):

(i) ein Affe hat den Hund gefüttert und den Kater gefüttert
an ape has the dog fed and the cat fed
'an ape fed the dog and fed the cat'

Note that (i) can be analyzed in two ways, viz., according to (ii), where there is only one trace bound by *ein Affe*, or according to (iii):

(ii) [ein Affe]$_i$ [hat [t_i [[den Hund gefüttert] und [den Kater gefüttert]]]]

(iii) [ein Affe]$_i$ [hat [[t_i den Hund gefüttert] und [t_i den Kater gefüttert]]]

It is plausible that the human parser avoids building up traces as far as possible; hence the preference for (ii).

5.2 A-binding

As we would expect, the observations on scope are paralleled by observations on binding. Consider (131), which is synonymous with (132):

(131) a. sich im Spiegel betrachtet hat Heinz selten und hat Karl häufig
-self in.the mirror viewed has Heinz seldom and has Karl often
b. [sich im Spiegel betrachtet]$_i$ [[hat Heinz selten t_i] und [hat Karl häufig t_i]]

(132) Heinz hat sich selten im Spiegel betrachtet, und Karl hat sich
Heinz has -self seldom in.the mirror viewed and Karl has -self
häufig im Spiegel betrachtet
often in.the mirror viewed
'Heinz seldom viewed himself in the mirror, and Karl often viewed himself in the mirror'

True reconstruction maps (131) into an R-structure representation similar to (132), so that one occurrence of *sich* '-self' can be A-bound by *Heinz* and a second occurrence can be A-bound by *Karl*, which is a correct result. According to pseudo-reconstruction, *sich* in (131) must be A-bound by *Heinz* as well as by *Karl*. This correctly accounts for the ungrammaticality of (133):

(133) * sich im Spiegel betrachtet haben die Jungen häufig und haben wir
-self in.the mirror viewed have the boys often and have we
selten
seldom

The reflexive *sich* must be bound, and *die Jungen* 'the boys' is a possible binder under reconstruction. As a consequence of the External Homogeneity Condition (5), reconstruction must apply to each conjunct if it applies to any conjunct; hence *sich* must also find a binder in the second conjunct. As *sich* (3rd person) cannot be bound by *wir* (1st person), the example is ungrammatical. But semantically it is a fault that *sich* is at the same time bound by *Heinz* and by *Karl* in (131). This could make sense if and only if *Heinz* is identical with *Karl* – an incorrect result.

A similar observation holds for (134), which shares a reading with (135):

(134) a. seinen Hund hat jeder selber gefüttert und hat kaum einer
his dog has every self fed and has hardly one
schlecht behandelt
bad treated
b. [seinen Hund]$_i$ [[hat jeder t_i selber gefüttert] und [hat kaum einer t_i schlecht behandelt]]

(135) es hat jeder$_i$ seinen$_i$ Hund selber gefüttert, und es hat kaum einer$_j$
it has every$_i$ his$_i$ dog self fed and it has hardly one$_j$
seinen$_j$ Hund schlecht behandelt
his$_j$ dog bad treated
'everyone$_i$ fed his$_i$ dog by himself, and hardly anyone$_j$ treated his$_j$ dog badly'

By pseudo-reconstruction, there is one occurrence of *seinen Hund* 'his dog' that is relevant for the determination of A-binding and for semantic interpretation. The possessive *seinen* 'his' can be A-bound by *jeder* 'everyone' and by *kaum einer* 'hardly anyone'. It must, in fact, be bound by each of them; but semantically this is nonsense. R-structure, on the contrary, is similar to (135) in that there are two occurrences of *seinen (Hund)*; consequently the first occurrence can be bound by *jeder* and the second one by *kaum einer*, in accordance with the facts.[28]

5.3 Discussion

While true and pseudo-reconstruction seem to be empirically indistinguishable in simple cases, their effects differ markedly in coordinate structures. The predictions of true reconstruction are consistently correct, whereas the predictions of pseudo-reconstruction are nonsensical or false. Let us briefly reflect on why this is so.

To say that an expression D is 'reconstructed' means that D behaves to a large degree as if it occupied the position of a trace t that it Ā-binds. True reconstruction generates a level of R-structure where D does in fact occupy the position of t. Consequently, in coordinate structures an occurrence of D is available in each conjunct. By applying the theories of A-binding, of scope determination and of

[28]Nevertheless, there is a problem. As there are two occurrences of the possessive at R-structure and any given possessive is ambiguous between a bound and a referential reading, (134) should be at least four-ways ambiguous; but in fact it is only two-ways ambiguous: the possessive may be referential (referring to one fixed referent), or it may be bound in the way we have discussed. There is no 'mixed' reading. The same observation holds of pronouns, as in (i), where either $j = l = h$, or $j = i$ and $l = k$:

(i) daß er gerne trinkt, würde fast jeder leugnen und würde kaum einer zugeben
that he gladly drinks would almost every deny and would hardly one admit
'almost everyone$_i$ would deny that he$_j$ likes drinking, and hardly anyone$_k$ would admit that he$_i$ likes drinking'

Presumably NPs must be determined as being referential or non-referential before reconstruction applies. (Notice that the conditions on reconstruction (110) also rely on a partial semantic characterization of the Ā-binder.) The consequences of this fact remain to be explored.

semantic interpretation at R-structure, D is translated correctly as a part of each conjunct. Pseudo-reconstruction, in contrast, seeks to achieve the same results at S-structure by allowing the expression D to be in the R-domain of expressions it s-commands. However, the notion of R-domain, by itself, does not suffice. Rather an appropriate translation of D must be available in each conjunct of a coordinate structure. The translation of (136a) (= (122)), for example, must have a translation of *einen Hund* 'a dog' as part of the translation of each conjunct. The translation of (136b) (= (134)), again, must have a translation of *seinen Hund* 'his dog' as part of the translation of each conjunct, and each of them must contain a different variable:

(136) a. einen Hund hat Karl gefüttert und hat Heinz gestreichelt
'Karl fed a dog, and Heinz caressed a dog'

b. seinen Hund hat jeder selber gefüttert und hat kaum einer schlecht behandelt
'everyone$_i$ fed his$_i$ dog by himself, and hardly anyone$_j$ treated his$_j$ dog badly'

If we wish to obtain these results not at R-structure but at S-structure, we have to introduce the assumptions singled out in (137):

(137) *Translation according to pseudo-reconstruction:*

i. In a coordinate structure each conjunct ^{i}B is separately evaluated with respect to the elements ^{j}A that are external to the conjuncts (cf. (1)).

ii. Under reconstruction the expression D is translated during the evaluation of a phrase P that is s-commanded by D, so that an appropriate translation of D is part of the translation of P.

Note that condition (ii) does not seem to introduce problems of a formal nature. We have been supposing throughout that the relation of the trace t contained in P to its Ā-binder D can be recognized at S-structure, hence D can be made accessible for the purpose of evaluating P.[29] In accordance with (i), then, the expression D will be translated as many times as there are conjuncts containing a trace Ā-bound by D. But condition (i) seems problematic. Although it resembles

[29] In this regard an S-structure representation from which Ā-binding relations can be retrieved would seem to be equivalent to a phrase linking grammar representation such as is used by Engdahl (1986). The evaluation of P cannot be done strictly compositionally at S-structure, in any case.

the way the External Homogeneity Condition on coordinate structures was put in (5), it contradicts the way that semantic interpretation of coordinate structures is standardly thought to be done (e.g., by Partee & Rooth 1983). The standard assumption is that the translation of the external elements ^{j}A combines with the translation of the entire coordinate phrase, whose translation in turn results from combining the translations of the conjuncts ^{i}B. We have seen that this method of interpretation can be successfully applied at R-structure but not at S-structure. It is not obvious, though, whether there are strong reasons to prefer the standard assumption over (137i).

In the next section we will turn to some considerations that might help in deciding between true and pseudo-reconstruction and, by implication, between the standard assumptions about coordination and (137i).

6 Pseudo-reconstruction or true reconstruction?

6.1 Ā-binding: Strong crossover

As a possible argument for true reconstruction, consider strong crossover:

(138) a. * who$_i$ does he$_i$ like e_i
b. * he$_i$ likes who$_i$

It seems natural to relate the impossibility of (138a) to the impossibility of (138b). In the latter, *who* cannot A-bind *he* since it is s-commanded by *he*, and *who* cannot be bound at all; cf. Wasow (1979) and Riemsdijk & Williams (1981). For this kind of explanation to be successful, however, it would have to be necessary that Ā-binding of *he* by *who* in (138a) is theoretically excluded. But why should Ā-binding of *he* be excluded? It is true that English does not favour Ā-binding of pronominals, but it does occur in weak crossover constructions (which are incomparably better than strong crossover constructions, as Wasow (1979) takes pains to demonstrate). Also, there are languages such as Swedish that even require resumptive pronouns under certain conditions, although they disallow strong crossover configurations just as English does. The same question arises with parasitic gap constructions: why is (139a) impossible although Ā-binding of a secondary gap is possible in (139b)?

(139) a. * who$_i$ do you think e'_i likes e_i
b. Bill is the kind of person whom$_i$ everyone who knows e'_i dislikes e_i

It seems that a principle such as (140) must be stipulated:

(140) *Restriction on multiple binding:*
If an A-position P_1 is in the unmarked (i.e., s-command) domain of an A-position P_2 and the category in P_2 is bound by some category E, then a category in P_1 cannot be bound by E.[30]

By (140), *e* in (138a) and (139a) cannot be bound by *who* since, by assumption, *he* and e' are. As an empty category can occupy the position of *e* only if it is Ā-bound, configurations like these are ruled ungrammatical at S-structure. If this account is correct, reconstruction does not have anything to contribute to an explanation of strong crossover.

6.2 Verum focus

In Section 3.1.3 we considered examples such as (141) (= (84b)):

(141) es HÖRT mir keiner zu
'no-one does listen to me'

There we concluded (i) that a meaning component symbolized as 'VERUM' is associated with the FIN-position and (ii) that VERUM can be in the scope of the negation because *hört* Ā-binds a trace that is in the domain of the negation. If this is to be accounted for by true reconstruction, VERUM must somehow be picked up by the verb *hört* and taken along into the position of the trace. But why and how should the verb be able to do that? It is the FIN-position that VERUM is associated with, and there is no independent reason for assuming that this situation may change during the derivation. It seems more adequate, hence, to assume that the scope of negation with respect to VERUM is accounted for by pseudo-reconstruction.

6.3 Lexical anaphors

In Section 4 we noted that for pseudo-reconstruction to work properly in German, the characterizations of the Opacity Domain of anaphors and pronominals had to be adjusted as in (116). For many speakers of English just the same considerations apply. However, a number of authors have observed that a subset of speakers do allow lexical anaphors to be bound in exactly those configurations that are impossible in German:[31]

[30] It follows that the relation of binding is intransitive, at least insofar as it observes s-command. I will in fact assume that it is always intransitive, even if s-command is not observed.

[31] See Weisler (1983). Furthermore, see Reed (1978) for (142b,c); Jacobson & Neubauer (1976), Rouveret & Vergnaud (1980) and Williams (1986) for (142a); Langendoen & Battistella (1982) and Guéron (1984) for (142b), and also Engdahl (1986: 112) for Swedish and Kitagawa (1986: ch. 4.3.8) for Japanese.

(142) a. Mary wonders which picture of herself John will prefer *t*
b. which picture of herself does Mary think that John will prefer *t*
c. which picture of herself do you think that Mary wants me to buy *t*

In the system of those speakers who accept (142) the reflexive contained in the phrase D (*which picture of herself*) can be bound by any phrase α that s-commands the reflexive or the trace of D, as long as α does not s-command an accessible SUBJECT that s-commands the reflexive.

If we wish to account for these data by true reconstruction, we must allow an expression D that contains a lexical anaphor (but not a pronoun) to optionally replace an intermediate trace in a Ā-position, rather than a trace in an A-position.

Under pseudo-reconstruction the characterization of the OD of lexical anaphors, repeated in (143), must be modified as in (144):

(143) X is the OD of a lexical anaphor δ if and only if X is the smallest constituent that contains an accessible SUBJECT β such that δ is in the R-domain of β. (Cf. (116i).)

(144) i. X is the OD of a lexical anaphor δ if X is the smallest constituent that contains an accessible SUBJECT β such that δ is in the domain of β, if there is such a constituent.
ii. Otherwise, the whole sentence is the OD of δ.

In (144i) "R-domain" of (143) is replaced by "domain", and in (144ii) the OD gets a default characterization. The effect is that the OD is directly determined by the s-command relations, without any appeal to the base position of D. In this sense (144) can be viewed as a natural generalization of (143). This is as we would expect, given that the system exemplified in (142) constitutes the marked case in relation to the more restricted versions of English and German, and that marked extensions of the unmarked case should be rationalizable in terms of generalization and simplification.

The extensions required for true reconstruction, by contrast, do not seem equally natural. If there is reconstruction, we expect the base position of D to be involved, as this position is naturally relevant for semantic interpretation. But reconstruction into an intermediate Ā-position seems an artificial consequence of the initial assumptions, rather than a natural generalization of the unmarked system. Conceptually, then, the accounts given for (142) by pseudo-reconstruction and by true reconstruction are very different, with true reconstruction looking distinctly suspicious.

6.4 Ā-binding: Parasitic gaps

We noted in Section 3.2.3 that a trace of ordinary *wh*-movement must be bound under s-command at S-structure, while a parasitic gap need not;[32] cf. (145) (= (105)) and (146) (= (107)):

(145) * [a sposare t_i]$_j$ [non so proprio [[quale ragazza]$_i$ [Gianni sarebbe disposto t_j]]]

'to marry t_i, I really do not know [which girl]$_i$ Gianni would be ready'

(146) ? [senza conoscere e_i prima bene]$_j$ [non so proprio [[quale altra ragazza]$_i$ [Gianni sarebbe disposto a sposare t_i t_j]]]

'without knowing e_i well beforehand, I really do not know [which other girl]$_i$ Gianni would be ready to marry t_i'

With respect to a true *wh*-trace there do not seem to be technical problems. At S-structure the checking mechanism takes a phrase occupying a Ā-position and looks for a trace s-commanded by it. In (145) a trace (viz., t_j) corresponding to *a sposare* is found, but there is no trace s-commanded by *quale ragazza*; hence this configuration is ungrammatical. In (146) a trace (t_j) corresponding to D$_j$ (*senza conoscere prima bene*) as well as a trace (t_i) corresponding to D$_i$ (*quale altra ragazza*) is found; hence this configuration is grammatical with respect to binding of traces of true *wh*-movement.[33] But how is the parasitic gap e_i in (146) formally licensed?

With true reconstruction the phrase D$_j$ containing e_i must be reconstructed into the position of the trace t_j that it Ā-binds, in order for e_i to be s-commanded by a Ā-binder. This will work as long as the Ā-binder D$_i$ that licenses the parasitic gap is not reconstructed by itself. But suppose it must be reconstructed, for example, if it contains a reflexive. In this case the parasitic gap cannot be licensed

[32] Unlike Italian, English strongly resists extraction from *wh*-interrogatives, in particular extraction of adjuncts. The initial adverbial in (i), therefore, cannot result from extraction (cannot bind a trace):

(i) after visiting Bill, who did you hire

We consequently expect English examples corresponding to (146) to be distinctly bad, and in fact E. McNulty observed that they are:

(ii) *without reading, which report did you file

See Lasnik & Uriagereka (1988: 75).

[33] A similar mechanism must apply for the determination of antecedent-government, if the account proposed for (104) is correct.

at R-structure. But by hypothesis, binding relations that are relevant for parasitic gaps are determined at R-structure. (If they were determined at S-structure, (146) should be ungrammatical in the same way as (145).)

The point may also be illustrated by examples adapted from K. Kearney (cited by Chomsky 1986a: 60):

(147) a. which books about himself did John file *t* before Mary could read *e*
b. * which books about herself did John file *t* before Mary could read *e*

While (147a) may be slightly marginal for some speakers, (147b) is impossible. Under true reconstruction, the binding relations of both *himself* and *e* must be determined at R-structure. But if the antecedent of *t* is reconstructed, as in (148), it can no longer license *e*:

(148) * John filed which books about himself before Mary could read *e*

We must conclude that parasitic gaps are licensed at S-structure. But at S-structure, true reconstruction cannot license (146) or (147a). Hence true reconstruction must give way to pseudo-reconstruction.

The examples (147) show more than this. The binding relations of the reflexive must be determined (by pseudo-reconstruction) with reference to *t*, not to *e*. Although *e* is licensed by D (*which books about himself*), D is not reconstructed with respect to *e*. The same fact is apparent from the meaning of the sentences. (147a) corresponds to (149), but not to (150):

(149) a. which books about himself did John file *t* before Mary could read them
b. John filed some books about himself before Mary could read them

(150) John filed some books about himself before Mary could read some books about herself

That is, the parasitic gap in (147a) as well as the pronoun *them* in (149) is anaphoric to the phrase *which/some books about himself*, with *himself* bound by *John*. In this regard, *e* does not behave like a trace Ā-bound by D, but like a pronoun A-bound by *t*. In fact, although the position of *e* (presumably) is not s-commanded by the position of *t*, it is in its domain, as shown by (151):

(151) a. John filed [every book]$_i$ before Mary could read it$_i$
b. John filed [no book]$_i$ before Mary could read it$_i$

Here *it* is A-bound by the quantified phrase in the object position of *filed*.[34]

[34] See Engdahl (1986: 300) for similar observations on Swedish.

Note also that (149a) does not show any weak crossover effect. Such an effect would be expected if *them* were Ā-bound by D in the way that *t* is. In parasitic gap constructions of the type shown in (152a) substitution of a pronoun for the empty category in fact yields the typical weak crossover effect, see (152b). With this type, binding from the position of *t* into the position of *e* is not possible, as shown by (152c):

(152) a. he is the kind of person whom$_i$ everyone who knows e_i dislikes t_i
b. ?? he is the kind of person whom$_i$ everyone who knows him$_i$ dislikes t_i
c. * many people who know him$_i$ dislike everyone$_i$

Clearly the properties of parasitic gap constructions like (147) and their difference from those like (152a) call for some elaboration of theoretical assumptions.

We may begin by distinguishing two different aspects of binding. First, binding has a purely syntactic aspect which need not have any semantic counterpart; call this s-binding. It appears that pure s-binding holds in constructions with obligatory reflexives that are often found in Slavic and Germanic languages (other than English):

(153) a. Karl weigert sich, das zu tun
Karl refuses -self that to do
'Karl refuses to do that'
b. Karl kümmert sich um die Kinder
Karl worries -self about the children
'Karl sees to the children'

It can be demonstrated that these reflexives are semantically empty (they do not bear a θ-role).

Second, binding typically has a semantic (or 'functional') aspect in that the possible semantic value of a bound expression is determined by its binder; call this f-binding.[35] The pronoun *it* in (151) is f-bound by the object of *filed*. By the same token, I will assume that *them* in (149) and *e* in (147a) are f-bound by the object of *file(d)* (the trace in (149a) and (147a)).

I will assume, furthermore, that for proper binding to be possible, the bindee must be s-bound and if it bears a θ-role, it must also be f-bound. In (147a) and (149a) the trace *t* is s-bound and f-bound by D (*which books about himself*). The

[35]It seems that virtually the same distinction between two aspects of binding has been made by Chomsky (1986b: 85).

pronoun *it* in (151) is s-bound (and f-bound) by *every book*/*no book*. In (149a) *them* is s-bound (and f-bound) by the trace. But in (147a) I assume the parasitic gap *e* is not s-bound by *t* (although it is f-bound by *t*). Rather I propose that *e* is s-bound by D, the Ā-binder of *t*. That is, I assume that in this type of construction s-binding and f-binding of one category (viz., *e*) can be exercised by different binders.[36] In (152), by contrast, it is obvious from (152c) that the object position of *know* cannot be s-bound by the object position of *dislikes*. Hence *him* in (152b) must be s-bound by *whom*. English strongly disfavours s-binding of an anaphoric expression by a Ā-binder, hence the marginality of (152b). In (152a) both *t* and *e* are s-bound by *whom*; *t* is f-bound by *whom*, and *e* presumably may be too.

Let us now return to the Italian case (154a) (= (146)) with the schematic structure (l54b):

(154) a. ? [senza conoscere e_i prima bene]$_j$ [non so proprio [[quale altra ragazza]$_i$ [Gianni sarebbe disposto a sposare t_i t_j]]]

b. [… e_i …]$_j$ [… [E$_i$ [… t_i t_j]]]

This is a parasitic gap construction of the type seen in (147). The f-binding of e_i is naturally accounted for under pseudo-reconstruction, as it is a case of A-binding (by t_i), assuming that the preposed adverbial clause falls under (110i). We must also allow s-binding of e_i by E_i to be possible under reconstruction. This is somewhat surprising, given that traces of true *wh*-movement are not licensed by reconstruction. The conclusion seems to be that a Ā-binder is not allowed to have its f-binding relations determined by reconstruction.

6.5 Ā-Binding: Weak crossover

To broaden the view on s-binding and f-binding, we may add some observations on weak crossover. Consider (155) and (156):

(155) a. ? wem$_i$ würden seine$_i$ Eltern t_i ein Auto schenken
whom would his parents a car donate
'for whom is it true that his parents would give him a car?'

[36] But naturally if β is s-bound by α, the semantic value of β must be determined by α. Hence either α f-binds β, or α f-binds δ and δ f-binds β. I continue assuming that binding is intransitive (cf. note 30), but I now restrict this assumption to any given type of binding (s-binding/f-binding). Hence in (147a), both *t* and *e* may be s-bound by D, as long as *e* is not s-bound by *t*. Notice that (147a) does not violate (140), since binding of *e* by *t* does not observe s-command.

b. ? [fast jeden Lehrer]$_i$ haben seine$_i$ Schüler schon mal t_i
almost every teacher have his students already once
reingelegt
cheated
'it is true of almost every teacher that his students cheated him at least once'

(156) a. ?* dann würden seine$_i$ Eltern jemandem$_i$ ein Auto schenken
then would his parents somebody a car donate
'then his parents would give a car to someone'

b. ?* deshalb haben seine$_i$ Schüler [fast jeden Lehrer]$_i$ schon
therefore have his students almost every teacher already
mal reingelegt
once cheated
'therefore his students cheated almost every teacher at least once'

While the judgements on (155) vary considerably with speakers and types of Ā-binders, the crossover effect is in any case weak, and many speakers find examples like these perfectly unobjectionable. (156) on the other hand is decidedly marginal. It appears, then, that the possessive (*seine* 'his') in (155) can be bound because it is s-commanded by its semantic antecedent at S-structure. That is, the weak crossover configuration is a kind of parasitic Ā-binding much like parasitic gap configurations are. We must also assume that German disfavours Ā-binding of possessives (and pronominals) to a much smaller degree than English does.

We must ask, then, what kind of binding is involved. The possessive can hardly be both s-bound and f-bound by its Ā-binder. If it were, – i.e., if a pronominal expression could be s-bound and f-bound by a Ā-binder just like empty categories can – we would expect resumptive pronominals to be possible in German at least to the extent that they are, for example, in Swedish. However, resumptive pronominals are possible in German at best to the degree that they are in English. Hence we have to choose between s-binding and f-binding, and the possessive must have different binders for s-binding and f-binding, just as parasitic gaps may have two different binders. We may conjecture that in cases like these it is always s-binding that is determined by s-command. If so, we must assume that the possessive is f-bound by the trace that is Ā-bound by the s-binder of the possessive.

This assumption finds some support in long extractions such as (157) and (158):

(157) a. wem$_i$ würden deine Eltern sagen, daß du t_i unter die Arme greifen sollst
whom would your parents say that you under the arms grip should
'for whom is it true that your parents would say that you should help him'

b. * wem$_i$ würden seine$_i$ Eltern sagen, daß du t_i unter die Arme greifen sollst

(158) a. [fast jeden Lehrer]$_i$ haben deine Kollegen gesagt, daß du schon mal t_i reingelegt hast
almost every teacher have your colleagues said that you already once cheated have
'it is true of almost every teacher that your colleagues said that you cheated him at least once'

b. * [fast jeden Lehrer]$_i$ haben seine$_i$ Kollegen gesagt, daß du schon mal t_i reingelegt hast

The (a)-cases, with a second person possessive (*deine* 'your') contained in the matrix subject, are fully acceptable (for speakers who make use of long extractions). In the (b)-cases the third person possessive (*seine* 'his') should be able to be bound by the preposed phrase; however, the bound reading is judged to be very bad even by speakers who judge (155) and the (a)-cases of (157), (158) to be impeccable. This state of affairs is not surprising under the assumption that the possessive must be f-bound by the trace. For this to be possible at all, we have to assume that f-binding – as opposed to s-binding – may rather liberally disregard s-command, perhaps in the way that quantifier scope does (in the marked case). But we would not expect f-binding to extend upwards out of its clause, just as scope typically does not. Consequently, the possessive can be f-bound by the trace in (155) but not in (157b) and (158b). The binding relation in (155), then, is similar to the one argued for in connection with (154) and (147), namely, it is determined by s-binding from a Ā-position and f-binding from an A-position.

These results lead us to reconsider (159) (= (152a)):

(159) he is the kind of person whom$_i$ everyone who knows e_i dislikes t_i

In Section 6.4 we assumed that *e* here may be f-bound by *whom*. But now it seems probable that *e* is f-bound by *t*. In fact the long extraction in (160) appears to be significantly worse than (159):

(160) ?* he is the kind of person whom$_i$ everyone who knows e_i believes that many students admire t_i

If these speculations are correct, an interesting generalization emerges:

(161) *Conjectures about Ā-binding:*

i. Only real traces can be f-bound by a Ā-binder.

ii. F-Binding by a Ā-binder must conform to s-command.

iii. A Ā-binder can be subject to reconstruction only with respect to a trace that it f-binds (i.e., a real trace).

7 Conclusion

In the course of the main discussion we considered two ways of construing 'reconstruction': true reconstruction, which involves an abstract level of representation, R-structure; and pseudo-reconstruction, which tries to do without such an extra level. Coordination showed that pseudo-reconstruction must be bought at a price: the standard view of the way coordinate structures are translated into the semantics must be abandoned. Although the translation mechanism that is needed under pseudo-reconstruction does not seem to pose extraordinary technical problems, one would not like to give up the standard view if not forced to. Consideration of some further kind of data – in particular, certain parasitic gap constructions – led us to conclude that true reconstruction cannot consistently achieve the results it is designed for. If these conclusions are correct, reconstruction is done at S-structure, and consequently the theory of semantic translation for coordinate structures must be revised in the way indicated in (137).

Conceptually this is an interesting result. Natural intuition would lead us to expect phenomena to fall into one of two classes: they should either be typical of S-structure or of reconstruction. Hence, many observers feel that true reconstruction is the natural way to account for reconstruction phenomena, and that pseudo-reconstruction, while technically possible, may be a descendant of ideological preconception rather than of open-minded inquiry. However, parasitic Ā-binding characteristically involves S-structure and reconstruction at the same time, and hence, pseudo-reconstruction.

The reason why parasitic Ā-binding can have its somewhat paradoxical properties seems to reside in the fact that under certain conditions two aspects of binding – viz., f-binding and s-binding – that normally go hand in hand can to some extent be dissociated from each other. If f-binding were necessarily coupled with s-binding, there would presumably be no parasitic binding at all, and

we would not have been able to see as clearly that true reconstruction is not available in natural language.

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