
Improper Movement and Unambiguous Binding

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Improper Movement and Unambiguous Binding

1 Introduction: The Principle of Unambiguous Binding

It is well known that different types of \bar{A} -movement do not behave alike with respect to landing sites and locality constraints. Given that all movement types instantiate applications of the general rule Move α , the problem is how to account for the observed asymmetries without introducing construction-specific constraints. The purpose of this article is to show that this can be achieved by invoking an articulated theory of improper movement, which interacts with a general theory of locality. More specifically, we contend that there are a number of cases of improper movement that cannot be explained by Principle C of Chomsky's (1981) binding theory, but can be accounted for by a principle that requires variables to be bound in an unambiguous way, as stated in (1).

(1) *Principle of Unambiguous Binding (PUB)*

A variable that is α -bound must be β -free in the domain of the head of its chain (where α and β refer to different types of positions).

Given that α -bound means 'bound from a position of type α ' (and β -free means 'not bound by a position of type β '), (1) implies that a particular type of \bar{A} -movement (e.g., movement to a β -position) may not feed another type of movement (e.g., movement to an α -position). As a case in point we consider, in section 2, scrambling and *wh*-movement, and argue that a lack of interaction between *wh*-movement and scrambling is a prerequisite for explanatory solutions to a number of empirical problems in languages as diverse as English, German, Russian, Korean, and Bulgarian. In section 3 we turn to an analysis of topicalization and show that this type of \bar{A} -movement behaves differently from both scrambling and *wh*-movement. These results will be shown to follow from (1) by a disambiguation of Move α in terms of the landing sites α and β , which refer to SpecC in

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the case of *wh*-movement, to S-Structure left-adjunction sites in the case of “scrambling” (which, throughout the article, is to be understood as a strictly structural, rather than a functional, operation), and to the specifier of a verbal functional head T (where T is the landing site of V/2 movement) in the case of topicalization. The content of (1) now reduces to the claim that movement into any of these positions cannot employ any other type of position as an escape hatch. Additional evidence is presented in section 4, where we consider extraposition, quantifier raising, (super)raising, dative shift, and head movement.¹

2 Scrambling versus *Wh*-Movement

2.1 Locality

As mentioned above, the theory of improper movement derives \bar{A} -movement asymmetries *in interaction with* a theory of locality. We will basically presuppose the theory of proper government developed by Lasnik and Saito (1984) and Chomsky (1986). As concerns the central notion of *barrier*, let us assume the definition in (2), which is based on a notion of Sportiche (1988:7, 1989:44), and which can be regarded as a generalization of Chomsky’s (1986) notion of “barrier by lack of L-marking.”²

(2) *Barrier*

XP is a barrier for A iff

- a. X^n includes A.
- b. X^n is not directly selected.
- c. X^0 is distinct from Y^0 , where Y^0 directly selects XP.

According to (2), only maximal projections are barriers. Depending on whether X^n is a maximal or an intermediate projection, two cases arise. Given that an intermediate projection X' cannot be selected, it turns its maximal projection XP into a barrier for any element included in X' . If, however, X^n is a maximal projection, it is a barrier for any element it includes only if it is not directly selected. For the time being, we may assume that an X^0 -category directly selects an XP under strict sisterhood (see Cinque 1990:40–

¹ Note that the PUB has its predecessors. In order to exclude cases of long-distance A-movement, Chomsky (1973:244) explicitly states (as a part of the Specified Subject Condition) that no rule can involve X and Y where “. . . (b) Y is in COMP and X is not in COMP.” Lasnik and Uriagereka (1988:155f., 168) observe that this condition might also be applicable in the case of adjunction and raise the question whether movement from COMP (i.e., SpecC) to an IP-adjoined position violates any constraints, but eventually, they put the issue aside. Likewise, Cinque (1990:172, n. 57) suggests that “movement from an adjunction position to a Spec position (or vice versa) would count as ‘improper.’” However, this proposal does not have any impact on his analysis, nor does it receive any independent motivation.

² (2) differs from Sportiche’s notion in two ways. First, in clause (2b) we have substituted “directly selected” for his “in a theta-marked position”; the former notion is more in line with recent findings by Cinque (1990:chap. 1) and others. Second, clause (2c) replaces the statement “ $A \neq X^0$,” which allows for head movement in Sportiche’s theory; our condition (2c) has the same effect but, as will become clear shortly, has some additional advantages. Undoubtedly, (2) is still too simple as it stands, but it will suffice for the purposes of this article.

43 for further details). Thus, subject and adjunct XPs are barriers; but, by clauses (2a) and (2b) for nonmaximal projections, directly selected XPs still are barriers for material dominated by the intermediate projection X' . Hence, XP (be it directly selected or not) is a barrier for an element that is included in X' ($X' \neq XP$), but only a nonselected XP is a barrier for its specifier position as well. In other words, clauses (2a) and (2b) state that the one case where a maximal projection is not a barrier for an A in XP is the case where XP is selected, and A occupies the specifier position of XP (i.e., is not included in X').

Clause (2c) reflects Baker's (1988) insight that head movement opens barriers. Following Baker, we assume that two heads are nondistinct if either overt or abstract incorporation (i.e., head movement at S-Structure or LF, respectively) takes place. (Head movement at LF can be read off of S-Structure by means of coindexation, thereby producing S-Structure nondistinctness.) However, incorporation may proceed only from directly selected XPs. This result is accomplished by (2c) (which is formulated as a logical implication and thus always holds true in case XP is not directly selected).

Summarizing so far, there are two ways to resolve the barrierhood of a directly selected XP: either movement proceeds via SpecX, or the XP barrier is opened by head movement. In addition, adjunction to an XP voids barrierhood, because government is defined in terms of exclusion/inclusion (see Chomsky 1986).

Before we turn to the main issue of improper movement, let us briefly point out some consequences of (2) with respect to CP, IP, and VP. Adjunct CPs are always barriers, since they are not directly selected. Moreover, C' is not directly selected; hence, CP is a barrier for every element included in C' . Since complementizers in general do not incorporate into matrix verbs (see Baker 1988), this implies that extraction from CP must proceed via SpecC, in successive-cyclic fashion. This derives the *Wh*-Island Constraint. On the other hand, VP (which is directly selected by I) is never a barrier, given the assumption that V and I always undergo incorporation (either at S-Structure by V-to-I movement, or at LF, after I-to-V lowering), as argued by Pollock (1989) and Chomsky (1991). With respect to IP (which is directly selected by C), it is clear that I may overtly incorporate into C by V/2 movement in some Germanic languages; let us assume here that in cases without overt movement, I and C can nevertheless be coindexed at S-Structure and thus also undergo abstract incorporation at LF, as proposed by Stowell (1981) and Pesetsky (1982). This implies that IP is not a barrier. Finally, note that XPs in SpecC and SpecI are always barriers since they occupy positions that are not directly selected.

As concerns the Subjacency Condition, we will assume that crossing two bounding nodes gives rise to a Subjacency violation, where bounding nodes are defined on the basis of barriers (see Chomsky 1986): An XP is a bounding node iff it either is, or immediately dominates, a barrier. (By *immediate domination* of one XP by another XP we mean, following Chomsky (1986:14), that no XP intervenes between the two.) With this theory of locality in mind, let us now turn to cases of improper movement.

2.2 Wh-Movement and Intermediate Adjunction

As a straightforward consequence of the PUB, *wh*-movement may never proceed via intermediate adjunction (i.e., scrambling) to either VP or IP (in contrast to what is assumed by Chomsky (1986) and Frampton (1990), among others); otherwise, a configuration would result that involves ambiguous binding of a variable. This lack of an intermediate trace has no damaging consequences in the present approach, since according to the theory of barriers sketched in section 2.1 (or the one developed by Cinque (1990)), VP and IP are not barriers in the first place; so there is no need for invisible adjunction. Moreover, it turns out that allowing for invisible adjunction in the course of *wh*-movement in fact makes wrong predictions with respect to the derivation of Subjacency effects.

One problem concerning invisible adjunction to VP has been pointed out by Johnson (1988:585, 596–603). He shows that Chomsky's *Barriers* framework is unable to derive a 2-Subjacency violation in extractions from clausal adjuncts:

- (3) a. ??Who_i did you [_{VP} t_i' [_{VP} go home [without [_{IP} Mary [_{VP} t_i' [_{VP} talking to t_i]]]]]]?
 b. ??Who_i did you [_{VP} t_i' [_{VP} go home [before [_{IP} Mary [_{VP} t_i' [_{VP} talked to t_i]]]]]]?

Clearly, the adjunct is a barrier for movement. However, it turns out that in this structure, it is the only barrier that intervenes between *t_i'* and *t_i*'. Therefore, the sentence cannot be ruled out by Subjacency, nor is there any other way to derive the ungrammaticality within Chomsky's system (and the same holds for the approach to locality given in section 2.1). But, of course, the PUB excludes representations like (3), where the variable *t_i* is simultaneously bound by the *wh*-operator in SpecC and by the intermediate traces in VP-adjoined positions. Thus, the only derivations of (3) compatible with the PUB will involve the crossing of two bounding nodes, namely, the adjunct and, by inheritance, the VP dominating the adjunct.

Similarly, the availability of invisible VP-adjunction undermines the analysis of *wh*-islands in Italian. As is well known, relativization can cross one *wh*-phrase, but crossing two *wh*-islands always leads to ungrammaticality, as shown in the standard example in (4) from Rizzi 1982:51.

- (4) ??Questo incarico [_{CP₁} che_i non so proprio [_{CP₂} chi possa avere
 this task that (I) not know really who could have
 indovinato [_{CP₃} a chi affiderò t_i]]]
 thought to whom (I)-would-entrust
 mi sta creando un sacco di grattacapi.
 is bringing me into trouble

If *wh*-movement could proceed via intermediate adjunction to VP, every step of the

derivation would involve the crossing of no more than one barrier, namely, CP. Again, the PUB excludes such a derivation. The additional landing site now being unavailable, long-distance relativization must cross the two bounding nodes CP₃ and CP₂ in one swoop, yielding a 2-Subjacency violation, without any further stipulation.

2.3 The Clause-Boundedness of Scrambling in German

Whereas section 2.2 has shown that scrambling may not feed *wh*-movement, we now go on to show that the reverse also holds. As first noted by Bierwisch (1963) and Ross (1967), scrambling in German (which we identify with left-adjunction to VP or IP) is strictly clause-bound; that is, a finite CP may never be crossed. This is illustrated by (5a–b), which involve scrambling from a *daß*-clause, and (5c–d), with scrambling from a V/2 clause.

- (5) a. * . . . daß niemand [_{VP} Pudding_i [_{VP} sagt [_{CP} t_i' daß sie t_i mag]]].
 that nobody pudding says that she likes
 '. . . that nobody says that she likes pudding.'
- b. * . . . daß [_{IP} Pudding_i [_{IP} niemand sagt [_{CP} t_i' daß sie t_i mag]]].
 that pudding nobody says that she likes
- c. * . . . daß niemand [_{VP} Pudding_i [_{VP} sagt [_{CP} t_i' würde_j [_{IP} sie t_i
 that nobody pudding says would she
 mögen t_j]]]].
 like
- d. *Gestern sagte [_{IP} Pudding_i [_{IP} niemand [_{CP} t_i' würde_j [_{IP} sie t_i
 yesterday said pudding nobody would she
 mögen t_j]]]].
 like

On the other hand, *wh*-movement can escape from either *daß*-clauses or V/2 clauses in the successive-cyclic manner depicted in (6).

- (6) a. Was_i sagt niemand [_{CP} t_i' daß sie t_i mag]?
 what says nobody that she likes
- b. Welchen Pudding_i sagt niemand [_{CP} t_i' würde sie t_i mögen]?
 which pudding says nobody would she like

This asymmetry between scrambling and *wh*-movement is remarkable from a theoretical point of view, since scrambling obeys roughly the same constraints as *wh*-movement clause-internally (with respect to extraction from NP, P-stranding, etc.; see Koster 1987: chap. 4 and Webelhuth 1989:335–361). Nonetheless, it looks as though scrambling cannot proceed via SpecC in a successive-cyclic fashion; apparently, SpecC in (5) is as unavailable for ‘‘long movement’’ as it is for extraction from *wh*-islands. This generalization immediately follows from the PUB. According to (1), *wh*-movement must not feed scram-

bling: since traces of scrambling are variables, they are subject to the unambiguous binding requirement.³ However, the variables t_i in (5) are bound ambiguously, both by their antecedent in a VP- or IP-adjoined position and by the intermediate trace in SpecC, in violation of the PUB. Thus, SpecC can never be an escape hatch for scrambling.⁴ On the other hand, the PUB is not violated in (6), where the variables t_i are bound unambiguously, from SpecC positions only.

Clearly, this prohibition against ‘‘improper movement’’ cannot be reduced to the ECP. It is hard to see how a locality condition could license SpecC-to-SpecC movement while blocking the much shorter movement from SpecC to VP or IP. Therefore, it seems that the ungrammaticality of (5) must be due to an independent principle barring improper movement.

2.4 Long-Distance Scrambling in Russian

As section 2.3 has shown, scrambling is strictly local in German (and in many other languages); a CP boundary may not be crossed here. This has led some authors to regard scrambling as an instance of A-movement (see fn. 3). In this section we show, however, that one should refrain from inferring, from the clause-boundedness of scrambling in German, that it is clause-bound in all languages. There are languages like Russian, where long-distance scrambling is possible, although (typical) A-dependencies do not exhibit long-distance properties (Rappaport (1986) shows that anaphoric elements must be bound within the minimal finite clause in Russian). Thus, if one strives for a *uniform* theory of scrambling (i.e., S-Structure left-adjunction), the data from Russian to be presented below clearly suggest an \bar{A} -movement approach to scrambling. Equally important in this context is the observation that, although scrambling in Russian appears to operate in a rather unconstrained manner (see Zemskaja 1973:394–402, Yadroff 1991), *wh*-movement is heavily restricted.

Note first that *wh*-movement from finite clauses in Russian may proceed only in case the complementizer bears a subjunctive feature (as in (7b)); an indicative complementizer (as in (7a)) destroys a bridge configuration (see Comrie 1973 and Pesetsky 1982).

- (7) a. ?*[Kakuju knigu]_i ty dumaeš' [_{CP} čto Petr pročital t_i]?
 which book you believe that_{IND} Peter read

³ It is not uncontroversial that scrambling is \bar{A} -movement, and that the trace left by scrambling is a variable. Fanselow (1990) and Santorini (1991) (among others) claim that scrambling (in German) is A-movement and therefore leaves behind an anaphoric trace. Webelhuth (1989:406–414) argues that scrambling exhibits properties of both A- and \bar{A} -movement. In Müller and Sternefeld 1991, we reject these analyses and argue that scrambling is uniformly A-movement, in German and elsewhere. Also see Stechow and Sternefeld 1988: 470–475, Saito 1989, and Vikner 1990.

⁴ Note that, so far, not all conceivable derivations of long-distance scrambling are excluded. Consider, for example, movement via IP-adjunction (as in (i)), or movement in one swoop (as in (ii)). For the time being, it may suffice to note that CP is a barrier (and bounding node) in both cases, according to (2). In order to derive the strong ungrammaticality of (5), more must be said. We return to this problem in section 2.8.

- (i) * . . . [_{VP} Pudding_i [_{VP} . . . [_{CP} — daß [_{IP} t_i' [_{IP} sie t_i mag]]]]]
 (ii) * . . . [_{VP} Pudding_i [_{VP} . . . [_{CP} — daß [_{IP} sie t_i mag]]]]

- b. [Kakuju knigu]_i ty dumaješ' [_{CP} čtoby Petr pročital t_i]?
 which book you believe that_{SUBJ} Peter read

As pointed out by Zemskaja (1973) and Comrie (1973), scrambling does not obey this constraint:

- (8) On skazal [_{CP} čto [_{IP} noski_i [_{IP} on rad [_{CP} čto kupil t_i]]]].
 he said that_{IND} the-socks he is-glad that he-bought
 'He said that he is glad that he bought the socks.'

In addition, there are no Subject Condition effects with scrambling (see (9a–b)), whereas subject clauses are strict islands for *wh*-movement, as shown in (10a–c) (see Zemskaja 1973 and Yadroff 1991).

- (9) a. Mne Katju_i kažetsja [_{CP} čto [_{IP} otpustit' t_i odnu tak pozdno]]
 me_{DAT} Katja_{ACC} seems that to-let-go alone so late
 bylo by bezumiem.
 be would insanity_{INSTR}
 'It seems to me that it would be insane to allow Katja to go alone so late at night.'
- b. [_{CP} čto [_{IP} Petrov_i [_{IP} stranno [_{CP} čto [_{IP} t_i nam pomogal]]]]]
 that Petrov_{NOM} is-odd that us helped
 'that it is odd that Petrov helped us'
- (10) a. ?*Kogo_i tebe kažetsja [_{CP} čto [_{IP} otpustit' t_i odno tak pozdno]]
 who_{ACC} you_{DAT} seems that to-let-go alone so late
 bylo by bezumiem?
 be would insanity
- b. *Kto_i stranno [_{CP} t_i' čto t_i nam pomogal]?
 who is-odd that us helped
- c. ?*Komu_i stranno [_{CP} čto on pomogal t_i]?
 who is-odd that he helped

Particularly telling is the grammaticality of Zemskaja's (1973) examples (11a–b), which show that long-distance scrambling may escape from a finite *wh*-island (also see Yadroff 1991).

- (11) a. Ty [_{VP} doktor_i [_{VP} videl [_{CP} kogda [_{IP} t_i pod''ezžal]]]]?
 you the-doctor_{NOM} saw when came
 'Did you see when the doctor came?'
- b. Vy [_{VP} pocytku_i videli [_{CP} kak zapakovali t_i]].
 you_{PL} parcel_{ACC} saw how (they-)did-up
 'You saw how they did up the parcel.'

In contrast, there is no *wh*-movement out of *wh*-islands in Russian (also see Sinicyn 1981, among others):

- (12) a. *Kto_i ty videl [_{CP} kogda t_i pod''ezžal]?
 who you saw when came
 b. ?*Čto_i vy videli [_{CP} kak zapakovali t_i]?
 what you_{PL} saw how (they-)did-up

Summarizing so far, we encounter a surprising asymmetry between *wh*-movement and scrambling, which again calls for a sophisticated theory of improper movement.⁵ Given the evidence of section 2.3, it looks as though Russian is almost the mirror image of German: in Russian scrambling is much less constrained than *wh*-movement, whereas the reverse holds in German. Therefore, two questions arise: How can the asymmetry between scrambling and *wh*-movement in Russian be accounted for? and How can the envisaged explanation be reconciled with our analysis of the German data that exemplified the inverse situation? The second question can also be restated as follows: Why is it possible for scrambling to violate locality constraints in Russian but not in German?

We give an answer to this question in section 2.5; the answer to the first question follows straightforwardly from the PUB. Whatever eventually turns out to be the reason for the option of long-distance scrambling in Russian (and the restriction of long *wh*-movement to subjunctive complements), it is clear that we must ensure that *wh*-movement may not use this option and build on long-distance scrambling, so that long-distance scrambling out of the embedded clause feeds subsequent short *wh*-movement in the matrix clause. In other words, long-distance *wh*-movement cannot be allowed to use a scrambling position as an escape hatch. Of course, this is exactly what the PUB predicts.

⁵ A reviewer remarks that the data in (8), (9a–b), and (11a–b) might be instances of topicalization or clitic left dislocation (CLLD; see Cinque 1990:chap. 2) rather than scrambling. But note that long-distance scrambling in Russian has the following properties: it may be iterated (see (i)); it does not create islands or block clause-bound *wh*-movement (thus, substituting *kto* 'who' for *ty* 'you' in (11a) does not result in ungrammaticality); it never induces verb raising; it may end in ungoverned (i.e., nonbridge) contexts (e.g., in clauses introduced by *čto*, as in (8)); and finally, the landing site may be to the right of the subject, as in (ii) (also see (11)).

- (i) . . . čto ty_i menja_j vižu [_{CP} čto t_i ljubiš' t_j].
 that you_{NOM} me_{ACC} I-see that love
 '. . . that I see that you love me.'
 (ii) No ja [_{VP} ix t_i postavila]_j pomnju [_{CP} čto [_{IP} *pro* [_{VP}[_{PP} v ška_f]_i t_j]].
 but I them put_{FEM} remember that in-the cupboard
 'But I remember that I put them into the cupboard.'

In section 3.1 we will show that topicalization crucially differs from scrambling with respect to all these properties (i.e., topicalization may not be iterated, it creates islands, etc.); hence, it seems that long-distance scrambling in Russian should not be analyzed as topicalization.

A detailed comparison of long-distance scrambling in Russian and CLLD in Italian is beyond the scope of this article. However, note that Italian CLLD, too, differs from long-distance scrambling in Russian in some respects. First, CLLD obeys the Subject Condition (see Cinque 1990:sec. 2.2). Second, elements that depend on antecedent government (and therefore must undergo successive-cyclic movement) may not participate in CLLD in Italian (see Cinque 1990:sec. 2.3.3); but in Russian even a finite VP (as in (ii)) can be scrambled long-distance. Third, Cinque (1990:sec. 2.3.5) shows that clitics are obligatorily present in Italian if an NP undergoes CLLD (and optional otherwise); no such constraint exists for long-distance scrambling in Russian. Finally, it seems that Russian actually has a phenomenon akin to Italian CLLD, which behaves differently from (long-distance) scrambling (e.g., clauses introduced by *čto* are islands for this construction); see Comrie 1973:sec. 3 for some discussion.

2.5 Adjunction Sites

It remains to account for the option of long-distance scrambling in Russian. First recall that, although it seems that the CP barrier can only be circumvented by moving into SpecC, the PUB implies that scrambling cannot use SpecC as an escape hatch. Yet in most alternative approaches to long-distance scrambling that we know of, SpecC may indeed be used as an additional escape hatch, contrary to what the PUB predicts (see, e.g., Browning and Karimi's (1990) discussion of long-distance scrambling in Persian). However, the existence of long-distance scrambling out of *wh*-islands (see (11a–b)) shows that long-distance scrambling must be possible even if the SpecC position is filled. Thus, independently of what is required by the PUB, one must conclude that scrambling has a different option.

Ideally, any explanation of the very possibility of long-distance scrambling in Russian should at the same time account for the apparent violations of island constraints. Hence, our task is twofold: not only must we explain why Russian crucially differs from German in allowing long-distance scrambling, we must also explain why Russian does not observe its own island conditions for *wh*-movement. Although these properties are not necessarily related, we may hope to find a single parameter that explains them both.

As it turns out, this can be accomplished in a straightforward manner. To begin with, recall that scrambling in German is confined to adjunction to VP and IP. But suppose now that Russian has the additional option of left-adjunction to CP. We then expect scrambling to be insensitive to CP barriers, whereas *wh*-movement still cannot escape from nonselected CPs and *wh*-islands; this corresponds exactly to the data discussed in section 2.4. As an example, consider the case of long-distance scrambling across a *wh*-island, as in (11a). Given the option of intermediate adjunction to CP, a possible derivation is (11a').

- (11) a'. . . . [VP doktor_i [VP . . . [CP t_i' [CP kogda C [IP t_i . . .]]]]]

Here, adjunction to CP voids the barrier, and the variable *t_i* does not violate the PUB, since it is bound by adjunction positions only; still, no such derivation is possible for *wh*-movement, because of the PUB. Therefore, *wh*-movement in (12) must cross a CP barrier.⁶

If Russian and German differ with respect to the option of intermediate adjunction to CP, one might expect there to be some independent justification for this claim, in the sense that there is *overt* adjunction to CP in Russian but not in German. This expectation is borne out. Consider the following data from Zemskaja 1973:

- (13) a. Ja byl [CP[NP novuju školu]_i [CP gde strojat t_i]].
 I was new school_{ACC} where they-build
 'I have been where they are building the new school.'

⁶ Similarly, *wh*-movement crosses a barrier in (10a–c), since subjects are not directly selected. Given that an indicative complementizer in Russian destroys a bridge configuration, and complements of nonbridge predicates are barriers (see section 3.6), the ungrammaticality of (7a) follows along the same lines.

- b. Ty znaeš' [_{CP} Petr Ivanyč_i [_{CP} čto [_{IP} t_i uže priexal]]]?
 you know Peter Ivanich_{NOM} that already came
 'Do you know that Peter Ivanich has already come?'

As for (13b), one could argue that the moved subject occupies the SpecC position. But given that Russian employs a Doubly Filled Comp Filter (it does not allow the cooccurrence of a *wh*-phrase in SpecC and a lexical complementizer), this is not very plausible; moreover, we will show in section 3 that there is a general prohibition against moving a [–*wh*]-phrase into the specifier of an overt complementizer. Therefore, the data in (13) show that Russian allows for left-adjunction to CP. In contrast, however, the strong ungrammaticality of the German counterparts of (13a–b) clearly shows that this option remains unavailable in German:

- (14) a. *Ich war (dort) [_{CP}[_{NP} die neue Schule]_i [_{CP} wo sie t_i bauen]].
 I was (there) the new school where they build
 b. *Hast du gewußt [_{CP}[_{NP} der Typ]_i daß t_i schon gekommen ist]?
 have you known the guy that already come has

The contrast is readily explained by assuming that (a) in both languages, the specifier of embedded CPs is inaccessible as an ultimate landing site for [–*wh*]-phrases (for reasons to be discussed in section 3); and (b) adjunction to CP is possible in Russian, but not in German. Thus, the claim that long-distance scrambling in Russian involves adjunction to CP receives independent motivation from the fact that Russian allows for overt adjunction to CP. More generally, it seems plausible to assume, as a methodological principle, that postulating an adjunction site requires *overt* justification of the kind just given.

Since the option of adjunction to CP is not available for scrambling in German, we must assume some kind of adjunction site parameter such as (15) in order to account for the characteristics of the languages under discussion.

- (15) *Adjunction site parameter for scrambling positions*⁷
 English: —; German: VP, IP; Russian: VP, IP, CP.

As a consequence of (15), scrambling is impossible in English; therefore, we must dismiss left-adjunction to VP altogether as an option in the grammar of English. Compared with Chomsky's (1986) theory, there are empirical and conceptual reasons to adopt this proposal. On the conceptual side, we need not explain why the adjunct position must always be *emptied* at S-Structure in English; left-adjunction to VP is simply not an available parameter value in the grammar of English. Furthermore, our theory of *wh*-movement does not depend on a (still nonexistent) "theory of adjunction" in the sense of the *Barriers*

⁷ Note that the adjunction site parameter conforms to the theory of parameters developed by Manzini and Wexler (1987); it respects the Subset Principle that restricts possible values of parameters.

framework. In fact, the above considerations suggest that no such theory can exist.^{8,9} Although we fully agree that adjunction circumvents barriers, we cannot use this device as a wild card: our postulation of (language-specific) adjunction sites is not driven by theory-internal considerations; rather, it directly reflects the scrambling properties of the particular language under investigation.

2.6 Scrambling of Operators

Further evidence for the PUB can be derived from the observation that *wh*-phrases and focused elements cannot undergo scrambling in German:¹⁰

- (16) a. Ich weiß nicht [_{CP} wem_j [_{IP} der Fritz t_j was gesagt hat]].
 I know not whom_{DAT} ART_{NOM} Fritz what_{ACC} said has
 'I don't know what Fritz said to whom.'
 b. *Ich weiß nicht [_{CP} wem_j [_{IP} was_i [_{IP} der Fritz t_j t_i gesagt hat]]].
 I know not whom_{DAT} what_{ACC} ART_{NOM} Fritz said has
 has
 (17) a. Ich glaube, daß ein Eingeborener einen ElePHANTen sah.
 I believe that a native an elephant saw
 b. Ich glaube, daß einen Elephanten_i ein EINGeborener t_i sah.
 c. *Ich glaube, daß einen ElePHANTen_i ein Eingeborener t_i sah.

In (16a) the *wh*-phrase *was* remains in situ; it has been scrambled in (16b). Similarly, the focused element in (17a) (where capital letters indicate stress) cannot be scrambled, as in (17c). The only possible order with an object preceding a subject is (17b), where the focused element remains in situ.

⁸ There have been attempts to *derive* the set of possible adjunction sites in a given language, instead of stipulating it, as we have done here. Chomsky (1986) assumes that adjunction is possible only to nonarguments; Weibelhuth (1987) and Frampton (1990) correlate the option of adjunction with directionality factors. For reasons of space we cannot discuss these proposals here; see Cinque 1990:sec. 1.7.3, Müller 1989, and Sternefeld 1991:sec. 7.3. The main problem with these theories of adjunction seems to be that they are unable to account for (a) cross-linguistic variation in overt adjunction, and/or (b) the different behavior of *wh*-movement and scrambling (but see footnote 9).

⁹ Mark Baker (personal communication) has suggested that the differences between English, German, and Russian with respect to left-adjunction could be accounted for by modifying Chomsky's (1986) constraints on adjunction: English does not allow (left-)adjunction at all, German allows adjunction only to nonarguments, and Russian allows adjunction to nonarguments and arguments. This would be in line with the claim in Müller and Sternefeld 1990 that Russian, unlike German, has adjunction to NP, too. But, apart from some theory-internal problems with Chomsky's constraints on adjunction (see the references given in footnote 8), this view is not compatible with evidence from Dutch, where it looks as though scrambling in front of a transitive subject is not possible, in contrast to German (see Koster 1987:chap. 4, Weibelhuth 1989:423, and Vikner 1990:chap. 4, among others). In the present framework, this can be accounted for by assuming that VP is a possible adjunction site in Dutch, whereas IP is not. It seems that the argument-nonargument distinction does not help here.

¹⁰ For discussion of this phenomenon, see Lenerz 1977, Weibelhuth 1989:sec. 6.4.3, Fanselow 1990:116-118, and Rizzi 1991a.

We derive an explanation for these data on the basis of the assumption that *wh*-phrases and focused elements undergo *wh*-movement to an operator position at LF (see the “rule of FOCUS” in Chomsky 1981). LF movement of *was* in (16a), for example, starts from an A-position, this being a canonical case of *wh*-movement. In contrast, LF movement of *was* in (16b) takes place from an adjoined position; therefore, it represents a case of scrambling feeding *wh*-movement, and the resulting representation (18) violates the PUB.

(18) * . . . [_{CP}[_{SpecC} . . . [+wh]_i] C [_{IP} t_i' [_{IP} . . . t_i . . .]]] (LF)

On the other hand, we also observe that long-distance scrambling in Russian often involves focusing of the scrambled element. Whether or not focused material can scramble seems to be a matter of parameterization. We therefore tentatively conclude that the PUB applies at S-Structure universally, whereas it may or may not apply at LF, subject to parametric variation. If it applies at LF, operators may not scramble; if it applies at S-Structure alone, this prohibition does not hold. The data above suggest that this is a parameter that distinguishes Russian from German—only in German will the PUB be a principle of both LF and S-Structure.

From the same perspective, consider multiple *wh*-fronting in languages like Russian and Polish. Rudin (1988) argues that multiple questions in these languages are formed by moving one *wh*-phrase into SpecC and adjoining the other(s) to IP. Consider the following example from Russian (Wachowicz 1974:158):

(19) [_{CP} Kto_i [_{IP} čto_j [_{IP} kogda_k [_{IP} t_i skazal t_j t_k]]]]?
 who what when said
 ‘Who said what when?’

According to the purely structural definition of \bar{A} -positions given above, the adjunction site of IP is a scrambling position, and *čto* and *kogda* have undergone “obligatory scrambling.” This implies that, contrary to common opinion, not all Slavic languages “wear their LF on their sleeve” (Pesetsky 1987:117, 1989:51); indeed, Rudin has shown that subsequent LF movement to SpecC must take place in order to put the *wh*-phrase in an operator position at LF. But this second movement gives rise to a configuration like (18), which would violate the PUB at LF; therefore, we must conclude again that the PUB applies only at S-Structure in Russian and Polish. As a result, *wh*-phrases can be scrambled, but they cannot use the scrambling position as an escape hatch, if movement to an operator position is to apply at the same level of representation (i.e., at S-Structure). Thus, the problem of accounting for the peculiar combination of possible overt adjunction (as in (19)) and impossible covert adjunction of *wh*-phrases (as in (7)–(12)) in Russian and Polish (which was first noted by Lasnik and Saito (1984:278–285)) is solved.

2.7 Superiority

Additional evidence for the PUB can be gained from the distribution of Superiority effects across Slavic languages. Rudin (1988:472–477) argues that unlike in Russian and Polish,

in Bulgarian all *wh*-phrases of a multiple question undergo operator movement to SpecC at S-Structure. Accordingly, it does not come as a surprise that Bulgarian exhibits Superiority effects with S-Structure *wh*-movement:

- (20) a. [_{SpecC}[_{SpecC} Koj_i] kogo_j] [_{IP} t_i vižda t_j]? (S-Structure)
 who whom sees
 b. * [_{SpecC}[_{SpecC} Kogo_j] koj_i] [_{IP} t_i vižda t_j]? (S-Structure)
 whom who sees

A standard ECP analysis of Superiority violations in languages like English (see Aoun, Hornstein, and Sportiche 1981) makes the correct predictions for (20), given the premise that operator movement at LF in multiple questions universally adjoins a *wh*-phrase to the right of SpecC, as argued by Rudin. The *wh*-phrase that is substituted in SpecC becomes the “head of Comp.” Only this *wh*-phrase (or rather, only the SpecC position coindexed with this *wh*-phrase) can antecedent-govern traces in IP, if antecedent government requires strict c-command. Therefore, *kogo_j* in (20a) and *koj_i* in (20b) cannot antecedent-govern their respective traces.¹¹ This has no consequences for the acceptability of (20a), due to θ -government of the object trace.¹² The subject trace in (20b), on the other hand, cannot escape the ECP, since it is not θ -governed.

Interestingly, there are no constraints on linear ordering of *wh*-phrases in multiple fronting structures of Russian or Polish. At first sight, this is rather unexpected, given that there is subsequent movement to SpecC at LF in these languages: the resulting LF representations should be ruled out on the same grounds as the corresponding structures in Bulgarian. Consider, for instance, the Polish examples in (21) from Rudin 1988:474.

- (21) a. [_{CP} Kto_i [_{IP} co_j [_{IP} t_i robił t_j]]]? (S-Structure)
 who what did
 b. [_{CP} Co_j [_{IP} kto_i [_{IP} t_i robił t_j]]]? (S-Structure)
 what who did

At LF *co* in (21a) and *kto* in (21b) must undergo (string-vacuous) movement to SpecC, in order to be interpretable as operators:

- (22) a. [_{CP}[_{SpecC}[_{SpecC} kto_i] co_j] [_{IP} t_j' [_{IP} t_i robił t_j]]] (LF)
 b. [_{CP}[_{SpecC}[_{SpecC} co_j] kto_i] [_{IP} t_i' [_{IP} t_i robił t_j]]] (LF)

(21b) is perfectly grammatical, even though its LF representation (22b) resembles a typical Superiority configuration. Given that *kto_i* ‘who’ in (22b) is unable to antecedent-

¹¹ However, we will assume that a *wh*-phrase adjoined to SpecC still *binds* its trace; otherwise, (20a) (indeed, multiple questions in general) should be ungrammatical, because an unbound variable (*t_j* in (20a)) would occur at LF (see Koster 1987). Thus, suppose that the notion “c-command” is defined in terms of “nonexclusion” for antecedent government, and in terms of “inclusion” for binding: α c-commands β iff α does not include β and every γ that *does not exclude/include* α includes β .

¹² Throughout the article we make the traditional assumption that θ -government exempts *wh*-traces from an antecedent government requirement. Rizzi (1990) and Cinque (1990), among others, argue that only traces of “referential” or “D-linked” (see Pesetsky 1987) XPs do not have to be antecedent-governed. However, nothing hinges on this question in the present context.

govern a trace included in C' , there must be a different reason why S-Structure adjunction to IP destroys a Superiority configuration. According to the theory of Lasnik and Saito (1984:280–289), t_i in (22b) is properly governed by its antecedent in IP-adjoined position at S-Structure and receives the feature $[+\gamma]$; in addition, LF movement of a *wh*-argument from an IP-adjoined position never gives rise to ECP effects.¹³ If this is correct, then the ECP is not violated in (22b), due to IP-adjunction of the *wh*-phrase at S-Structure.

Although we believe that the explanation of the contrast between Bulgarian and Polish in terms of IP-adjunction (which is basically Rudin's (1988)) is essentially correct, there is still an important gap in the argument. Bulgarian is a free word order language where IP qualifies as a possible adjunction site for scrambling (see Molxova 1970:27 and Rudin 1985:13–39):

- (23) a. . . . če [IP studentət [VP pozdravi profesora]].
 that student says-hello-to professor
 b. . . . če [IP profesora; [IP studentət [VP pozdravi t_i]]].

But if the option of adjunction to IP exists, there is no a priori reason why intermediate S-Structure adjunction to IP should be prohibited. Then, the Bulgarian Superiority configurations would turn into well-formed structures. (20b) could be analyzed as (24).

- (24) *_{[SpecC[SpecC Kogo_j] koji]} [IP t_i' [IP t_i vižda t_j]]? (S-Structure)
 whom who sees

Here, t_i is properly governed by t_i' at S-Structure, and t_i' , being an intermediate trace of an argument, could delete on the way to LF, without inducing an ECP violation. Obviously, what differentiates the Bulgarian and Polish data is that in Bulgarian all movement occurs at S-Structure already. But given that the PUB constrains S-Structure representations in all languages, (24) is ruled out in a straightforward way: t_i is simultaneously bound by t_i' (which occupies an IP-adjoined position) and by koj_i (which occupies an operator position). Thus, the theory of improper movement seems to be essential for maintaining Rudin's approach to Superiority phenomena in the Slavic languages.

¹³ Lasnik and Saito (1984) derive this latter statement by assuming that LF movement of an argument from a derived \bar{A} -position need not leave behind a trace. If this is the case, then we must assume that the PUB is a constraint on derivations rather than representations; otherwise, the ungrammaticality of operator scrambling in German (as in (16b)) could no longer be derived. Similarly, the principle of Full Representation to be developed in section 2.9 would have to be reformulated as a principle of "Full Derivation." However, in Müller 1992a it is argued that Superiority effects should be traced back to the presence of an IP barrier at LF in $[+wh]$ -clauses, rather than to a lack of c-command. On this approach, intermediate adjunction to IP serves to open this barrier, and we can assume that XP-movement obligatorily leaves traces. Then, the PUB can be maintained as a representational constraint. Since the difference between representational and derivational theories of movement is a subtle one, we will not pursue the issue here; see Müller 1992a:sec. 6 for further discussion.

2.8 Long-Distance Scrambling in Korean and the Deletability of Traces

Let us now consider whether the behavior of intermediate traces of scrambling chains is compatible with the theory of Lasnik and Saito (1984). According to this theory, traces of arguments should be deletable in principle. In order to maintain this result, however, some modifications of various principles seem to be called for.

In his discussion of *wh*-movement in German, Haider (1986:118) claims that “the conclusion cannot be avoided that Move α leaves intermediate traces obligatorily and that these traces cannot be replaced, irrespective of the government status of the base position.” Since “in German traces can be neither replaced nor deleted” (Haider 1986: 120), he further concludes that the mechanism proposed by Lasnik and Saito must be given up. We will not follow Haider in this respect; nevertheless, his case against deletion gains some support from our analysis of scrambling. Consider the derivation (25), which should be compared with (5a).

- (25) * . . daß niemand [_{VP} Pudding_i [_{VP} sagt [_{CP} — daß [_{IP} t_i' [_{IP} sie t_i mag]]]]].
 that nobody pudding says that she likes

Whereas (5a) (with successive-cyclic scrambling via SpecC) violates the PUB, the derivation in (25) does not, because SpecC is not used as an escape hatch. Now, CP is a barrier (and bounding node) for t_i' (since t_i' is included in C'); but if t_i' may delete on the way to LF, an ECP effect cannot be derived. However, long-distance scrambling from finite clauses is strongly ungrammatical in German, even with arguments. Accordingly, it is assumed in Sternefeld 1989 that the sharp ungrammaticality of long-distance scrambling in German must be a consequence of the ECP, rather than of Subjacency. (In fact, not even a Subjacency violation should result in (25), because CP is the only bounding node.) So it appears that the strong deviance of this construction must be a consequence of the requirement that intermediate traces are not deletable in scrambling chains. Then, t_i in (25) is properly governed by t_i' ; but t_i' becomes the “offending” trace, because CP is a barrier for t_i' , according to (2), and thus blocks antecedent government of t_i' . But now consider yet another derivation, namely, long-distance scrambling in one swoop:

- (26) * . . daß niemand [_{VP} Pudding_i [_{VP} sagt [_{CP} — daß [_{IP} sie t_i mag]]]]].
 that nobody pudding says that she likes

In order to guarantee an ECP effect, it seems that we must stipulate that a chain requires antecedent government whenever an adjunction site enters into chain formation. That is, adjunct positions “contaminate” a chain, with the effect that each link in a chain requires antecedent government: as soon as a single adjoined position is an element of a chain, each trace must be antecedent-governed. This further requirement accounts for (26): t_i must be antecedent-governed, because its chain antecedent occupies an adjunction position, but it is not antecedent-governed, because of an intervening CP barrier. More-

over, it also follows that movement of adjuncts always requires antecedent government, as predicted by Lasnik and Saito (1984).

However, the ban against trace deletion in scrambling chains turns out to be problematic for the analysis of scrambling in Korean and Japanese. Lee (1992) shows that Korean uses roughly the same adjunction sites for scrambling as German (it does not allow adjunction to CP), but nevertheless long-distance scrambling of objects is grammatical. The following examples (from Shin-Sook Kim, Hyun-Hee Lee, and Jung-Goo Kang (personal communications)) show that declarative complements are transparent for scrambling of [–wh]-objects (as in (27a–b)) and [+wh]-objects (as in (27c)).¹⁴

- (27) a. [IP Kulim-ul_i [IP Chelswu-ka [CP ai-ka t_i kuli-ess-ta-ko]
 picture-ACC Chelswu-NOM child-NOM draw-PAST-DECL-COMP
 mi-oss-]]-ta.
 believe-PAST-DECL
 ‘Chelswu believed that the child drew the picture.’
- b. [IP Yenghi-ka [VP posek-ul_i [VP pepceng-eyse [CP nay-ka t_i
 Yenghi-NOM jewelry-ACC court-in I-NOM
 hwumchi-ess-ta-ko] cwucangha-]]-ess-]-ta.
 steal-PAST-DECL-COMP testify-PAST-DECL
 ‘Yenghi testified in court that I stole the jewelry.’
- c. [IP Yenghi-ka [VP[NP enu chayk-ul]_i Chelswu-eykey_j [CP PRO_j t_i
 Yenghi-NOM which book-ACC Chelswu-DAT
 ilk-ula-ko] malha-]-ess-]-ni?
 read-IMP-QUOT say-PAST-Q
 ‘Which book did Yenghi tell Chelswu to read?’

As one would expect by analogy with German, long-distance scrambling of [\pm wh]-adjuncts turns out to be ungrammatical:

- (28) a. *[IP Swulcip-eyse_i [IP Yenghi-ka [CP nay-ka t_i sikan-ul
 pub-LOC Yenghi-NOM I-NOM time-ACC
 ponay-ss-ta-ko] mit-ess-]]-ta.
 spend-PAST-DECL-COMP believe-PAST-DECL
 ‘Yenghi believed that I had spent time in the pub.’

¹⁴ See Saito 1985:chaps. 3–4 for arguments that examples like (27a–c) are instances of long-distance scrambling in Japanese (rather than, e.g., of topicalization). All these arguments carry over to Korean (see Lee 1992). Note, for example, that long-distance scrambling may be iterated in Korean, which follows directly from the adjunction analysis:

- (i) [IP Kulim-ul_i [IP Yenghi-eykey_j [IP Chelswu-ka [CP ai-ka t_j t_i cwu-ess-ta-ko]
 picture-ACC Yenghi-DAT Chelswu-NOM child-NOM give-PAST-DECL-COMP
 sayngkakha-n-]]]-ta.
 think-PRES-DECL
 ‘Chelswu thought that the child gave the picture to Yenghi.’

- b. *_{[IP Way_i [_{IP} ne-nun [_{CP} Chelswu-ka t_i o-ass-ta-ko]}
 why you-TOP Chelswu-NOM come-PAST-DECL-COMP
 sayngkakha-]-ni?
 think-Q
 'Why do you think Chelswu came?'

On the other hand, *wh*-movement of adjuncts is possible at LF. This is illustrated in (29) (where (29a) is the S-Structure representation of the sentence, and (29b) is its representation at LF).

- (29) a. [_{IP} Ne-nun [_{CP} Chelswu-ka way o-ass-ta-ko]
 you-TOP Chelswu-NOM why come-PAST-DECL-COMP
 sayngkakha-]-ni?
 think-Q
 'Why do you think Chelswu came?'
- b. [_{CP} way_i [_{IP} ne-nun [_{CP} Chelswu-ka t_i o-ass-ta-ko] sayngkakha-]-ni]

Saito (1985, 1987) has shown that the same contrast can be found in Japanese; he remarks that the observed asymmetry between *wh*-movement and scrambling is "a . . . problem, for which I do not have any interesting solution to offer" (1985:179). However, this adjunct movement asymmetry immediately follows from the PUB, given the assumption that CP is not a possible adjunction site in Korean and Japanese. Long LF movement of a *wh*-adjunct (as in (29)) may proceed via intermediate substitution in SpecC; but S-Structure long-distance scrambling of an adjunct may not use SpecC as an escape hatch (because of the PUB), and thus an adjunct trace in the lower CP is not antecedent-governed, exactly as in German.¹⁵

The account of the data exhibiting long-distance scrambling of objects is more involved.¹⁶ Above, we have assumed that all elements of a scrambling chain depend on antecedent government. Obviously, this requirement can always be met by the initial trace of object scrambling, since objects can always be adjoined to VP. But in addition, we have stipulated that traces of scrambling chains cannot be deleted on the way to LF. This requirement now turns out to be inconsistent with the possibility of long-distance

¹⁵ Note that the observed asymmetry in adjunct movement cannot be reduced to an S-Structure-LF distinction of movement types. Long relativization of adjuncts in Korean (which we may assume to be an instance of *wh*-movement for the time being; however, see footnote 19) may escape from the environments that block scrambling; compare (28) with (i), which is grammatical.

(i) [_{NP}[_{CP} Yenghi-ka [_{CP} nay-ka t_i sikan-ul ponay-ss-ta-ko] mit-nun Op_i] swulcip]
 Yenghi-NOM I-NOM time-ACC spend-PAST-DECL-COMP believe-REL pub
 'the pub in which Yenghi believes that I spent time'

¹⁶ We have not considered subject movement in our discussion of Korean and Japanese. As concerns long-distance scrambling, subjects seem to pattern with adjuncts, rather than with objects. The opposite holds for *wh*-movement at LF (see Lasnik and Saito 1984). This contrast does not follow from our assumptions. But Saito (1985:210–222) has convincingly argued that subjects in Japanese cannot undergo S-Structure movement at all, for reasons of Case theory; thus, their behavior is compatible with the analysis given.

scrambling of objects in Korean (or Japanese); it seems to be necessary, then, to parameterize our condition on chains in such a way that scrambling chains in Korean and Japanese entirely correspond to the theory developed by Lasnik and Saito (1984), whereas scrambling chains in German are subject to the additional requirement of antecedent government laid down above.

2.9 *The Principle of Full Representation*

Although the proposed parameter seems to be induced by the facts, closer inspection reveals that a further unification is possible. We just hypothesized that scrambling traces cannot be deleted on the way to LF in German, in contrast to Korean, Russian, and Polish. But at the same time another difference has been postulated, namely, that the PUB applies at LF in German, but not in the other languages. Finally, the assumption that traces of scrambling must be antecedent-governed, even if they are θ -governed objects, is necessary only in German (see (26)), but cannot play a role in the other languages that allow for deletion of intermediate traces. Thus, it looks as though a generalization is being missed, if no connection is established between these assumptions. Let us therefore try to do away with the unrelated, language-particular parameters proposed in sections 2.6 and 2.8.

In order to derive their effects from a universal principle, let us assume that, at the level where the PUB applies, representations must be fully “articulated” in the sense that intermediate traces *must* be generated whenever this is compatible with the PUB. In a sense, this means that representations cannot lack traces but must be fully “blown up” whenever this is consistent with unambiguous binding. This can be formulated as follows:

(30) *Full Representation*

If, in representation $\dots \alpha_i \dots [\beta \dots t_i \dots] \dots$,

- a. β excludes α_i ,
 - b. β includes t_i ,
 - c. the chain $C = \langle \dots \alpha_i \dots t_i \dots \rangle$ is subject to the PUB, and
 - d. β is a possible adjunction site for C ,
- then α_i cannot *locally* bind t_i .

(31) β is a possible adjunction site for C iff

- a. β is a possible adjunction site according to the adjunction site parameter (15), and
- b. adjoining a trace t_i' to β would not violate the PUB (for $C' = \langle \dots \alpha_i \dots t_i' \dots t_i \dots \rangle$).

The principle of Full Representation (30) is in fact a local binding requirement on chains: if a chain occurs at a level where the PUB applies, then Full Representation enforces the presence of intermediate traces in adjunction sites that are compatible with both the

PUB and the adjunction site parameter. Consequently, Full Representation applies to chains at S-Structure and at LF in German, since the PUB applies at these levels. This maintains the analysis of all the German data discussed so far. To see this, recall that VP is a possible adjunction site, according to (15); therefore, Full Representation enforces adjunction to VP in scrambling chains of objects and rules out a representation like (26). In contrast to our analysis in section 2.8, we can now assume that the mechanism proposed by Lasnik and Saito holds in full generality. Theoretically, then, the IP-adjoined trace in (25) could be deleted on the way to LF. But deletion would produce a structure that is not in accordance with Full Representation, since the PUB applies at LF in German, and Full Representation requires every possible intermediate trace in adjoined position to be present. Thus, Full Representation reconciles our analysis with the classical formulation of the ECP, whereby θ -government of the object is sufficient to satisfy the ECP with respect to the object position. This is so, because ungrammatical scrambling of objects will give rise to offending *intermediate* traces.

Turning now to languages like Russian and Korean, Full Representation can easily be satisfied at S-Structure; often, its effect is independently induced by the need to circumvent barriers. In languages like Korean and Russian, some of the traces generated by Full Representation at S-Structure (viz., the intermediate traces of arguments) can be deleted again on the way to LF, because, by assumption, the PUB does not hold at LF in these languages. In conclusion, then, offending traces cannot be deleted in German because representations must be fully articulated at S-Structure *and* at LF. Thus, the mechanism proposed by Lasnik and Saito holds in full generality, but its effects can be overruled by Full Representation. Moreover, Full Representation captures the relation between the obligatory presence of certain traces and the level(s) where the PUB applies. Thus, no specific properties of scrambling chains need to be stipulated in order to account for their behavior with respect to locality constraints.

So far we have shown that the PUB plays an important role in accounting for differences between scrambling and *wh*-movement. Let us now turn to topicalization, which has been analyzed in the literature both as left-adjunction to IP (i.e., scrambling, in our terms) and as movement to SpecC. In what follows, we will argue that neither classification is correct.

3 Topicalization

3.1 *Topicalization versus Scrambling*

Baltin (1982), Johnson (1988), Rochemont (1989), and Lasnik and Saito (1989, 1992) agree in analyzing (embedded) topicalization in English as adjunction to IP. Chomsky (1977) argues that topicalization obeys the same island constraints as *wh*-movement. This seems to indicate that topicalization can use SpecC as an escape hatch. But according to the theory developed so far, long topicalizations as in (32) (from Lasnik and Saito 1989:20)

would induce ambiguous binding, with a trace being simultaneously bound by the operator position SpecC and the adjunct position occupied by the topic.

- (32) John said that [_{IP} this book_i [_{IP} he thought [_{CP} t_i' (that) you would like t_i]]].

In order to avoid a PUB violation, one might want to introduce a genuine ambiguity with respect to the SpecC position, so that SpecC may serve both as topic position and as a *wh*-position. According to our earlier methodological assumptions, however, this move would lead us to expect that the SpecC position could, at least in principle, also be filled overtly with a topic. As (33) shows, this prediction is not borne out, either in English or in German.¹⁷

- (33) a. *Mary said [_{CP} for Ben's car_i that [_{IP} she paid 5 grand t_i]].
 b. *Maria sagte [_{CP} für Ben's Auto_i daß [_{IP} sie t_i 5 Riesen zahlte]].

Furthermore, our theory would be strengthened considerably if ambiguous positions could be excluded on universal grounds. We therefore assume that, at a given level of representation, each position is unambiguously classified. In a way, then, this statement is complementary to the PUB: binding of traces must proceed from positions of the same type, and no position can be of more than one given type. This hypothesis clearly rules out the analyses shown in (32) and (33). Moreover, the adjunction approach to topicalization faces internal problems. Recall that we have equated left-adjunction with scrambling, without giving any functional interpretation to these notions. Analyzing topicalization as adjunction to IP would in turn equate topicalization with scrambling; in fact, this is exactly what Lasnik and Saito (1989:5f., 1992:193) postulate. However, scrambling and topicalization differ substantially. To show this, we will now present a number of topicalization-scrambling asymmetries.

(i) If topicalization is adjunction to IP, it remains to be explained why topicalization can take place only once in a clause, whereas scrambling can easily be iterated, as evidenced by the following examples from German, Russian (Zemskaja 1973), and Japanese (Saito 1985):

- (34) a. . . . daß dem Fritz_i die Geschichte_j [_{IP} niemand t_i t_j glaubt].
 that ART_{DAT} Fritz the story_{ACC} nobody_{NOM} believes
 '. . . that nobody believes Fritz's story.'
 b. . . . čto knigu_i mne_j [_{IP} Maksim dal t_j t_i].
 that book_{ACC} me_{DAT} Maxim gave
 '. . . that Maxim gave me the book.'
 c. Naihu-de_i Bill-o_j [_{IP} John-ga t_j t_i sasita].
 knife-with Bill-ACC John-NOM stabbed
 'John stabbed Bill with a knife.'

¹⁷ It might be argued that (33a) can be ruled out by the Doubly Filled Comp Filter. This explanation does not work for German, however, since this filter is not operative here; see, for example, (48b).

(ii) It has often been noticed that topics create strict islands for both *wh*-movement and topicalization in the Germanic languages. Consider the following examples from English (see Rochemont 1989, Lasnik and Saito 1989, 1992) and German:¹⁸

- (35) a. *What_i do you think [_{CP} t_i' that [_{??} for Ben's car [_{IP} Mary will pay t_i]]]?
 b. *That man_i I know [_{CP} t_i' that [_{??} this book_j [_{IP} Mary gave t_j to t_i]]].
- (36) a. *Ich weiß wen_i du sagtest [_{CP} Ede_j habe_k [_{IP} t_j t_i getroffen t_k]].
 I know who_{ACC} you said Ede has_{SUBJ} met
 b. *Den Hans_i sagte sie [_{CP} Ede_j habe_k [_{IP} t_j t_i getroffen t_k]].
 ART_{ACC} Hans said she Ede has_{SUBJ} met

It seems to be difficult to find an explanation for the topic island effect that is consistent with the analysis of scrambling as adjunction to IP. To see this, let us briefly confront scrambling with Lasnik and Saito's (1989, 1992:chap. 3) theory of topic islands, which is based on the assumption that topicalization is adjunction to IP. They suggest that IP is a barrier; furthermore, their theory implies that adjunction to an IP barrier creates a new maximal projection ("??" = IP in (35)) that rules out successive-cyclic movement of an object to SpecC as a Subjacency violation. But applying this theory to structures that involve scrambling leads to strange results. It should follow that scrambling to IP—just like topicalization—induces islandhood. But unlike topicalization, scrambling has no effect whatsoever on the extractability of other material, as can be seen in the following example from German, which involves long *wh*-movement of an adjunct (also see Pesetsky 1982 for evidence from Russian):

- (37) Wie_i meinst du [_{CP} t_i' daß dieser Frau_j [_{IP} der Ede t_i t_j geholfen hat]]?
 how think you that this_{DAT} woman ART Ede helped has
 'How do you think that Ede helped this woman?'

Therefore, the idea that adjunction can multiply barriers must be rejected; more importantly, (37) sheds doubt on the adjunction theory of topicalization.

(iii) The adjunction theory also is not compatible with the fact that topicalization can induce subject-aux inversion, that is, V/2. In English this holds for topicalization of monotone decreasing quantifiers, as in (38); see Kayne 1984:225–226 and May 1985:10.

- (38) a. [In no case]_i would [_{IP} he give up t_i].
 b. I personally think [_{CP} that [under no circumstances]_i will [_{IP} he be willing to go along with us t_i]].

Moreover, in many Germanic languages verb raising is obligatory if topicalization ap-

¹⁸ In addition, the topic island effect holds in Icelandic (Zaenen 1980), in Frisian (de Haan and Weerman 1986), in Swedish (Platzack 1986, Engdahl 1986), and in Yiddish (Travis 1984, Den Besten and Moed-van Walraven 1986, Den Besten 1989; but see Diesing 1990 for a different view, and Den Besten 1989:162–166 for a refutation of her analysis). Observe also that topicalization in (36) has induced V/2 movement—a matter to which we return immediately.

plies, in contrast to scrambling. This is shown in (39) for Yiddish (Den Besten 1989:140), in (40) for Norwegian (Taraldsen 1986:18), and in (41) for German.

- (39) a. Ikh bin zix mexaie [_{CP} vos in nujork_i voinen_j [_{IP} mir t_j t_i]].
 I am REFL glad that in New York live we
 'I am glad that we live in New York.'
 b. *Ikh bin zix mexaie [_{CP} vos in nujork_i — [_{IP} mir voinen t_i]].
- (40) a. Vi tenkte [_{CP} (at) [?? pengeri ville [_{IP} han ikke ha t_i]].
 we thought that money would he not have
 'We thought that he did not have money.'
 b. *Vi tenkte [_{CP} (at) [?? pengeri — [_{IP} han ikke ville ha t_i]].
- (41) a. Ich glaube [_{CP} den Fritz_i mögen_j [_{IP} viele t_i t_j]].
 I believe ART_{ACC} Fritz like many_{NOM}
 'I believe that many people like Fritz.'
 b. *Ich glaube [_{CP} den Fritz_i — [_{IP} viele t_i mögen]].
 I believe ART_{ACC} Fritz many like

From this we conclude that subject-aux inversion in topicalization structures is less marked than the English data would suggest and should be treated uniformly along the lines of V/2 movement in languages like German.

(iv) Whereas scrambling in German is clause-bound (see (5)), topicalization is not (see (42)); again, this suggests that the two processes must be distinguished.

- (42) a. Pudding_i glaube ich [_{CP} t_i' würde sie t_i mögen].
 pudding believe I would she like
 'Pudding, I believe that she would like.'
 b. Pudding_i glaube ich [_{CP} t_i' daß sie t_i mögen würde].
 pudding believe I that she like would

(v) Furthermore, we observe that topicalization blocks clause-bound *wh*-movement (see the English and German examples in (43)), whereas scrambling does not have any blocking effects on *wh*-fronting (see (44)).¹⁹

- (43) a. *I wonder [_{CP} to whom_i that book_j he gave t_j t_i].
 b. *What_i in the living room_j did Mary find t_i t_j?

¹⁹ Baltin (1982) gives examples like *a man to whom liberty we could never grant*, where it seems that topicalization does not block clause-internal relativization (but see Lasnik and Saito 1989, 1992:85–86 and Rochemont 1989 for critical discussion). We have been reluctant to completely assimilate relativization to *wh*-movement, and indeed there are other cases where this movement type behaves differently. Note, for example, that relative operators in German (optionally) agree with a functional head *wo*, rather than with *daß*, in contrast to *wh*-elements. Moreover, long relativization is impossible in some (Northern) dialects of German (in contrast to *wh*-movement); in others (e.g., in Bavarian), relativization exhibits *that*-trace effects (in contrast to *wh*-movement). Also see Tajima (1987) for some cross-linguistic evidence. It is likely that these asymmetries between relativization and *wh*-movement eventually could give further support for the PUB; however, we disregard relativization in the remainder of this article.

- c. *Ich frage mich [_{CP} warum_i den Fritz_j hat diese Frau t_i t_j
I ask myself why ART_{ACC} Fritz has this_{NOM} woman
geküßt].
kissed
'I wonder why this woman kissed Fritz.'
- d. *Warum_i den Fritz_j hat diese Frau t_i t_j geküßt?
why ART_{ACC} Fritz has this_{NOM} woman kissed
- (44) a. Ich weiß nicht [_{CP} was_i dem Fritz_j diese Frau t_j t_i
I know not what_{ACC} ART_{DAT} Fritz this_{NOM} woman
geschenkt hat].
given has
'I don't know what this woman gave to Fritz.'
- b. Was_i hat dem Fritz_j diese Frau t_j t_i geschenkt?
what_{ACC} has ART_{DAT} Fritz this_{NOM} woman given

(vi) It has often been observed that in most Germanic languages embedded topicalization is licensed only in special contexts; see, for example, Platzack 1986 and Den Besten 1989.²⁰ This is shown in (45) for German (see Haider 1984), and in (46) for English (see Hooper and Thompson 1973).

- (45) a. Ich glaube [_{CP} den Fritz_i mag [_{IP} jeder t_i]].
I believe ART_{ACC} Fritz likes everyone
- b. *Ich bedaure [_{CP} den Fritz_i mag [_{IP} jeder t_i]].
I regret ART_{ACC} Fritz likes everyone
- c. *Mich hat überrascht [_{CP} den Fritz_i mag [_{IP} jeder t_i]].
me_{ACC} has surprised ART_{ACC} Fritz likes everyone
- d. *. . . obwohl den Fritz_i mag [_{IP} jeder t_i].
although ART_{ACC} Fritz likes everyone
- (46) a. I think [_{CP} that to Tom_i [_{IP} Mary gave a book t_i]].
- b. *I resent [_{CP} that to Tom_i [_{IP} Mary gave a book t_i]].
- c. * [_{CP} That to Tom_i Mary gave a book t_i] really surprised me.
- d. *. . . because to Tom_i [_{IP} Mary gave a book t_i].

Embedded topicalization is possible in bridge contexts (see (45a)/(46a)) and impossible in CP complements of nonbridge verbs (see (45b)/(46b)), in subject clauses (see (45c)/(46c)), and in adjunct clauses (see (45d)/(46d)). Crucially, scrambling to IP is not restricted in this way. Thus, compare (45)/(46) and (47).

- (47) a. Ich glaube [_{CP} daß dem Fritz_i [_{IP} diese Frau t_i ein Buch gibt]].
I believe that ART_{DAT} Fritz this_{NOM} woman a book gives

²⁰ Icelandic and Yiddish appear to be exceptions in this respect. For some recent discussion, see Vikner 1990:chap. 1 and references cited there.

- b. Ich bedaure [_{CP} daß dem Fritz_i [_{IP} diese Frau t_i ein Buch gibt]].
 I regret that ART_{DAT} Fritz this_{NOM} woman a book gives
- c. Mich hat überrascht [_{CP} daß dorthin_i [_{IP} keiner t_i gehen will]].
 me_{ACC} has surprised that there no one go wants-to
- d. . . . obwohl den Fritz_i [_{IP} jeder t_i mag].
 although ART_{ACC} Fritz everyone likes

All these asymmetries clearly show that topicalization cannot be analyzed as adjunction to IP.

3.2 Topicalization versus Wh-Movement

In this section we will contrast topicalization with *wh*-movement in the Germanic languages and argue that topicalization should not be analyzed as (involving) *wh*-movement—that is, movement to SpecC—either (in contrast to what is argued in Chomsky 1977).

(i) One obvious difference arises from the observation that a topic occurs with a complementizer to its left in languages like English (see (48a)), whereas a *wh*-phrase can only occur with a complementizer to its right (in languages like German where the Doubly Filled Comp Filter does not hold; see (48b)).

- (48) a. Bill says [_{CP} (that) *John*_i (*that) [_{IP} Mary doesn't like t_i]].
 b. Ich weiß nicht [_{CP} (*daß) wen_i (daß) [_{IP} du t_i gesehen hast]].
 I know not that who_{ACC} that you seen have

In contrast to (48b), a topic cannot cooccur with a complementizer to its right in German:

- (49) a. Ich glaube [_{CP} den Fritz_i hat [_{IP} sie t_i gesehen]].
 I believe ART_{ACC} Fritz has she_{NOM} seen
 b. *Ich glaube [_{CP} den Fritz_i daß [_{IP} sie t_i gesehen hat]].
 I believe ART_{ACC} Fritz that she_{NOM} seen has

(ii) Moreover, whereas a topic cooccurs with V/2 in German (as in (49a)), a *wh*-phrase cannot (see Haider 1984 and Reis 1985):

- (50) a. Ich sagte [_{CP} wen_i (daß) [_{IP} sie t_i gesehen hat]].
 I said who_{ACC} that she_{NOM} seen has
 b. *Ich sagte [_{CP} wen_i hat [_{IP} sie t_i gesehen]].
 I said who_{ACC} has she_{NOM} seen

The same contrast occurs in Yiddish (see (51a–b), from Den Besten 1989:163) and English (see (51c–d)).

- (51) a. Ikh veys nit [_{CP} vuhin_i [_{IP} ir geyt t_i]].
 I know not where you_{PL} go

- b. *Ikh veys nit [_{CP} vuhin_i geyt [_{IP} ir t_i]].
- c. I don't know [_{CP} what_i [_{IP} Mary is doing t_i]].
- d. *I don't know [_{CP} what_i is [_{IP} Mary doing t_i]].

These facts strongly suggest that topics are “V-oriented,” whereas *wh*-phrases are “C-oriented.” Some further asymmetries between topicalization and *wh*-movement arise with respect to extraction.

(iii) It seems to be the case that topic islands are much stricter than *wh*-islands in the Germanic languages. For German, this contrast is illustrated in (52).

- (52) a. *Radios_i glaube ich [_{CP} gestern_j hat [_{IP} Ede t_j t_i repariert]].
 radios_{ACC} believe I yesterday has Ede repaired
- b. ??Radios_i weiß ich nicht [_{CP} wie_j (daß) [_{IP} man t_j t_i repariert]].
 radios_{ACC} know I not how that one repairs

(iv) However, extraction of a *wh*-phrase across a (topic or *wh*-) island is always bad:

- (53) a. *Was_i glaubst du [_{CP} gestern_j hat [_{IP} Ede t_j t_i repariert]]?
 what_{ACC} believe you yesterday has Ede repaired
- b. *Welches Radio_i weißt du nicht [_{CP} wie_j (daß) [_{IP} man t_j t_i repariert]]?
 which radio_{ACC} know you not how that one repairs

These examples indicate that any theory of topicalization must account for at least the following two asymmetries: the contrast between topic islands and *wh*-islands observed in (52); and the contrast between topic extraction and *wh*-extraction from a *wh*-island, as in (52b) versus (53b).

All these asymmetries lead us to conclude that topicalization is neither movement to SpecC nor adjunction to IP. Rather, we contend that topics are specifiers of their own topic phrase (TP), as shown in (54).

- (54) I think [_{CP} SpecC [_C that] [_{TP} in no case_i [_T will] [_{IP} he give up t_i]]].

Given this additional landing site for topicalization, the problem that has arisen for the PUB with respect to long topicalization can now be solved along the following lines. The structure depicted in (54) suggests that there is a way to avoid an ambiguous classification of \bar{A} -positions if long topicalization can use an embedded SpecT position as an escape hatch. Thus, no ambiguous binding will arise in a structure like (32').

- (32') John said that [_{TP} this book_i T [_{IP} he thought [_{CP} — (that) [_{TP} t_i' T [_{IP} you would like t_i]]]]].

The claim we will defend in the following sections is that the structure of topicalization is uniform in all Germanic languages. More precisely, we assume that Germanic phrase structure is *homogeneous* in the sense that it *always* contains a CP that embeds a TP, that is, a structure [_{CP} SpecC C [_{TP} SpecT T . . .]]. This implies that the topic projection

behaves in certain respects exactly like the CP projection; although it is not always “activated,” it is there. Thus, we propose a restrictive version of the “CP-recursion” hypothesis for topicalization (see Chomsky 1977, Platzack 1986, Den Besten 1989, and Vikner 1990:chap. 2). The main differences are that we assume that there are *always* two clausal functional heads, and that we would like to suggest that these two heads differ substantially: one functional head is inherently nominal (C), whereas the other is inherently verbal (T).

As a direct consequence of this analysis of topicalization, the prohibition against topicalization of *wh*-phrases in multiple questions in English (see Lasnik and Uriagereka 1988:156, Lasnik and Saito 1989:30, 1992:103–104, Rizzi 1991a:9, Epstein 1992:247–248) can be derived:

- (55) a. Who believes [_{CP} that [_{TP} T [_{IP} Mary likes whom]]]?
 b. *Who believes [_{CP} that [_{TP} whom_i T [_{IP} Mary likes t_i]]]?

Assuming that the PUB applies both at LF and at S-Structure in English (as it does in German), LF movement of the *wh*-phrase to SpecC in (55b) will give rise to a configuration very much akin to illicit *wh*-scrambling in German (recall (16b)). After LF movement of *whom* in (55b), the resulting chain involves ambiguous binding of *t_i* (from SpecC and SpecT).

3.3 Matching

Before we can give an account of the asymmetries between topicalization and other types of movement, we must clarify a problematic aspect of the analysis of long topicalization given in (32'). Because of the PUB, SpecC is not a possible escape hatch for topics; therefore, the intermediate topic trace must be more deeply embedded in CP. However, given the definition of barrier in (2), it would now follow that CP is a barrier (and bounding node) for *t_i'* in SpecT, and the matrix VP a bounding node by inheritance. Thus, we should expect a Subjacency violation in (32'), and an ECP violation in the cases of long topicalization of an adjunct, contrary to the facts. In order to solve this problem, let us adopt a version of identification of projections that has been proposed by Haider (1988). A closer look at (32') reveals that the crucial part of the structure involves the configuration (56a), which is reminiscent of what Haider has called *matching projections*.

- (56) a. . . . [_{CP} e that [_{TP} t_i' e
 b. . . . [_{CP/TP} t_i' that

In Haider's theory, (56a) can reduce to the *matching structure* (56b), where “a matching projection is a projection superimposed on an existing projection such that the nodes of the primary projection serve as secondary nodes of the superimposed projection”

(Haider 1988:112). With respect to the barrierhood of CP, the matched structure (56b) has just the properties we want it to have, because here CP cannot be a barrier for t_i' . Nonetheless, a representation like (56b) cannot be permitted in our theory as such, because it would reintroduce the very ambiguity of the specifier position of CP/TP that we are trying to avoid. In order to solve this problem, let us assume the following structure-preserving definition of matching:

(57) *Matching*

Two functional XPs match iff one immediately dominates the other, and at least one specifier position of these projections is empty.

Now, the intended matching effect can be regained by a modification of barrierhood. What we see in (56) is that two matching projections behave in certain respects as if they were one, much as with adjunction structures. In exactly the way we talk about the hosts of adjuncts, we will say that a matching projection has two (or more) single projections as its *segments*. Now, for a matching projection to be a barrier between α and β , we require that each of its segments be a barrier between α and β . From the fact that maximal projections of T and C cannot constitute barriers for their respective specifier positions, it now follows that movement into any of the specifiers of the segments of matching projections has the same effect as adjunction; it is a safe way to circumvent a barrier. In other words, the blocking effect of *one* segment of a matching projection can always be undone by moving into *any* of its segments. This solves the problem that arose with (32').²¹

3.4 *The Licensing of SpecX*

Let us now turn to an explanation of the data in sections 3.1 and 3.2. First note that C and T are, from a functional point of view, competing heads—both are “complementizers” of a clause (i.e., both precede IP). But whereas C is a potentially nominal category (see Kayne 1984), T is a potentially verbal category (see Stechow and Sternefeld 1988: sec. 11.7). If we assume (as seems natural) that a clause cannot be *both* nominal *and* verbal, one of the functional heads must be “activated.” Let us call the activated node the *designated* clausal head. Suppose now that, by default, the clausal system is nominal, which means that C is the designated head. In the marked case, T is the designated head. (This case needs further justification, which will be dealt with in section 3.6.) Whether or not T is the designated head seems to correlate with the occurrence or nonoccurrence of topicalization; the relation between designated heads and the elements in their respective specifier positions is spelled out in (58) and (59).

²¹ On the other hand, matching projections do not behave exactly like the hosts of adjuncts, because crossing a matching projection without going into one of the specifiers still involves the crossing of *two* barriers; see section 3.6.

(58) *Uniqueness of Designated Head*

Exactly one of the two functional heads C and T is the designated head of CP. CP is “nominal” when C is the designated head, and CP is “verbal” when T is the designated head.

(59) *Licensing Condition for \bar{A} -Specifiers²²*

A [\pm wh]-phrase in (\bar{A} -) SpecX must agree with an appropriate designated head X, where C is appropriate for [+wh]-phrases (called *wh-operators*) and T is appropriate for [–wh]-phrases (called *topics*).

The Licensing Condition (59) partly accounts for the distribution of elements in the CP/TP system; in particular, the landing site of *wh*-elements is bound to be to the left of *that*, whereas the landing site of topicalization is to the right of *that*. Thus, the following derivations of (49b) and (50b) are straightforwardly excluded by the Licensing Condition for \bar{A} -Specifiers:

(49) b'. *Ich glaube [_{CP} den Fritz_i [_C daß] [_{TP}[_{IP} sie t_i gesehen hat]]].
 I believe ART_{ACC} Fritz that she_{NOM} seen has

(50) b'. *Ich sagte [_{CP}[_{TP} wen_i [_T hat] [_{IP} sie t_i gesehen]]].
 I said who_{ACC} has she_{NOM} seen

In the next section we will show that alternative analyses of (50b) (with the *wh*-phrase in SpecC) can also be ruled out.

As a consequence of the uniqueness requirement in (58) we can now derive another difference between scrambling and topicalization. Above we have shown that scrambling does not block clause-bound *wh*-movement (see (44)), in sharp contrast to the blocking effects that can be observed in simultaneous short *wh*-movement and topicalization (see (43)). For example, consider (43a), which, according to our assumptions, must have the following structure:

(43) a'. *I wonder [_{CP} to whom_i C [_{TP} that book_j T [_{IP} he gave t_j t_i]]].

Here, both the *wh*-phrase and the topic occupy \bar{A} -specifier positions and require agreement with a designated head. But since only one head (either T or C) can function as the designated head of a clause, there is no way to rescue the sentence. Thus, the cooccurrence of *wh*-movement and topicalization in a clause is excluded.

3.5 The Derivation of V/2 in German

Let us now turn to the distribution of elements in the two head positions C and T. The examples analyzed so far clearly indicate that verb movement to T is not obligatory in English topicalization structures; nevertheless, we will show that there is reason to

²² Note that this condition can be viewed as part of a generalized version of the *Wh*-Criterion, which covers all kinds of \bar{A} -specifiers. For related discussion, see Koster 1987, Noonan 1989, and Rizzi 1989, 1991a.

believe that even in this case topicalization requires the CP to be verbal, regardless of whether or not the Top-position is "filled." Likewise, it looks as though a designated C does not always require an overt complementizer in C; nor does a complementizer in C necessarily indicate that C is designated. As concerns English, then, the "activation" of a projection at first sight appears to be largely independent of morphological filling (but see below). The situation is more perspicuous in German. Here, we find a (close to) one-to-one correspondence between designation and phonological visibility. This correspondence becomes perfect if we say that embedded questions also have a complementizer *daß* at S-Structure that can (optionally) be deleted at PF:

- (60) Ich weiß [_{CP} wer_i (daß) [_{TP}[_{IP} t_i kommt]]].
 I know who that comes

The V/2 phenomenon, including the so-called complementary distribution of the finite verb and the complementizer (see Den Besten 1983, Haider 1984), now directly follows from (61) and our earlier assumptions about the uniqueness of the designated head.

- (61) *Visibility Condition for Clausal Functional Heads*

A clausal functional head (C or T) is designated if and only if it is visible at S-Structure.

(61) holds in German; we will turn to other Germanic languages later. As shown in (62), it now follows that (a) in ordinary complement clauses C cannot be empty; (b) in the presence of topicalized phrases T cannot remain empty; (c) only one functional head can be filled in topicalizations; and (d) only one functional head can be filled in embedded questions.

- (62) a. *Ich glaube [_{CP} — [_{IP} viele kommen werden]].
 I believe many come will
 b. *Ich glaube [_{CP}[_{TP} den Fritz_i — [_{IP} viele t_i mögen]]].
 I believe ART_{ACC} Fritz many like
 c. *Ich glaube [_{CP} daß [_{TP} den Fritz_i mögen_j [_{IP} viele t_i t_j]]].
 I believe that ART_{ACC} Fritz like many
 d. *Ich weiß [_{CP} wen_i daß [_{TP} (immer) mögen_j [_{IP} viele t_i t_j]]].
 I know who_{ACC} that always like many

Turning again to the inconsistency of *wh*-complementation and V/2 (see (50b)), we find that alternative analyses with the *wh*-element in SpecC are also blocked, since the *wh*-element requires an overt licensing head that it agrees with (see (50b'')). To rule out every possible derivation of such sentences, it remains to show that a third analysis, given in (50b'''), can also be excluded.

- (50) b''. *Ich sagte [_{CP} wen_i [_{TP} hat [_{IP} sie t_i gesehen]]].
 I said who_{ACC} has she seen
 b'''. *Ich sagte [_{CP} wen_i hat_j [_{TP} t_j [_{IP} sie t_i gesehen]]].

To block movement of the verb into C (as in (50b^{'''})), let us assume that C is not featureless in embedded clauses and thus resists verb incorporation (see Rizzi 1991a for similar ideas).^{23,24}

3.6 *The Distribution of Embedded Topicalization*

We showed in section 3.1 that the occurrence of V/2 clauses in German is severely restricted (see (45)). Haider (1984:79–82) and Grewendorf (1989:54) argue that the class of verbs that allow V/2 complements is identical to the class of bridge verbs, that is, to those that allow extraction out of a complement clause in German. Thus, compare (45a–b) with (63a–b).

- (63) a. Wen glaubst du [_{CP} t_i' daß jeder t_i mag]?
 who believe you that everyone likes
 b. ??Wen bedauerst du [_{CP} t_i' daß jeder t_i mag]?
 who regret you that everyone likes

As concerns the barrierhood of complements of nonbridge predicates, it may suffice for present purposes to follow Kayne (1984:81), Fukui (1986:11), Cinque (1990:30), and Frampton (1990:54), who argue that there is a structural difference between complements of bridge verbs and complements of nonbridge predicates, such that the latter are generated in a position more remote from the verb and are thus not “L-marked” in Chomsky’s sense. Within the present approach, this means that CP complements of nonbridge predicates, although selected, are not *directly selected*. These CPs, then, are invariably barriers, which induce Subjacency violations in cases of argument extraction, and ECP violations in cases of adjunct movement.²⁵

Given that embedded topicalization requires a verbal CP (i.e., a designated T) and is confined to bridge environments, the obvious conclusion is that a designated T must be governed by a lexical category. Since a verbal category usually requires *government*

²³ Accordingly, the barrierhood of IP is now resolved by I-to-T movement at LF, not by I-to-C movement, as assumed in section 2.1. On verb movement in root clauses, see section 3.10.

²⁴ This account of the general prohibition against the cooccurrence of *wh*-elements in SpecC and V/2 differs from the approaches of Haider (1984:91–100) and Rizzi (1991a) in that it does not depend on the presence of [+*wh*]-features in C. This has an interesting consequence for cases of “partial *wh*-movement” (see Van Riemsdijk 1983, Stechow and Sternefeld 1988:sec. 11.1, and McDaniel 1989). In (i) *'was* must be analyzed as a scope marker that attracts the cosuperscripted *wh*-phrase *'wann* at LF. As shown in (ii), *glauben* ‘believe’ does not embed indirect questions; nevertheless, (i) is fully grammatical.

- (i) *'Was glaubte sie [_{CP} 'wann_i [_{IP} er t_i ins Wirtshaus geht]]?*
 what believed she when he into-the pub goes
 (ii) **Sie glaubte [_{CP} wann_i [_{IP} er t_i ins Wirtshaus geht]].*
 (iii) **Was glaubte sie [_{CP} 'wann_i geht [_{IP} er ins Wirtshaus]]?*

As shown by (iii), there is an incompatibility between *wh*-in-SpecC and V/2, even if C is not marked [+*wh*]. This fact cannot be captured by Haider’s or Rizzi’s theories, but follows from our assumptions without further stipulation.

²⁵ We abstract away from the issue of CP-extrapolation in German here. See Müller and Sternefeld 1990 for a proposal, and for a different account of bridge verbs.

by an element that assigns verbal Case to it (or *status-governs* it, in the terminology of Bech (1955/57)), this conclusion is in line with other licensing conditions for verbs. Extending the idea to the case at hand, this implies that the verbal CP must be “status-governed” or “licensed” by a lexical head:

(64) *Licensing Condition for Embedded Verbal CPs*

A designated embedded T node must be head-governed by a lexical category.

This condition (which ultimately may follow from an articulated theory of status government) accounts for the ungrammaticality of (45b–d): here, the embedded CP is a barrier and blocks head government of the designated verbal head T.²⁶ Hence, the distribution of embedded V/2 clauses in German is explained by (64) and our assumptions about bridge verbs.

Let us now turn to English. Recall that the distribution of embedded topicalization in English is the same as in German (see (46)). This clearly suggests that embedded topicalization in general requires T as a designated head (which in turn must be lexically governed); and this is of course exactly what the Licensing Condition (59) predicts. Thus, the English data in (46) are explained along the same lines as embedded V/2 in German. However, two differences between English and German arise. First and most obviously, the designated verbal head T need not be lexicalized in English, as opposed to German. This difference, however, does not have any impact on the government requirement of a designated T node; it is simply a side effect of the fact that English lacks condition (61) (in its strict form at least; see below), which derives obligatory V/2 in German. The second difference concerns the presence of the complementizer *that* in (46), an issue to which we now turn.

3.7 Complementizers and Complementizer Drop

Complementizers in English differ from their German counterparts in three ways. First, in most dialects of English they are obligatorily deleted in embedded *wh*-clauses (where they are designated). Second, they occur in embedded topicalizations (i.e., without being designated, according to our assumptions). Third, they can be missing without inducing V/2 movement, but only in bridge configurations. We will address these issues in turn.

As concerns deletion of a designated C in embedded *wh*-clauses, we will simply assume that most dialects of English (but not all; see Chomsky and Lasnik 1977) employ

²⁶ Note that CP is not a barrier for head government of T by the matrix verb in bridge configurations like (45a), since there is matching of TP and CP. Thus, T is governed as soon as C is governed. Now, given the definition of barrier in (2), CP is governed by the matrix verb, but C cannot be governed unless we assume government percolation to the head. Thus, suppose that Case government of an XP generally percolates down to the head X. On the one hand, this assumption accounts for the fact that a noun bears the Case assigned to its maximal projection; on the other hand, it guarantees that verbal Case, which is assigned by a matrix predicate to a CP that it governs, percolates to C and, if matching occurs, to T, so that condition (64) is respected. Later we will show that it is essential that T cannot satisfy the licensing condition (64) when CP and TP do not match.

a PF deletion rule “*that* → ∅ / [+wh] _____,” which applies obligatorily and blocks classical “Doubly Filled Comp” configurations. (In many dialects of German the rule applies optionally.) With that in mind, let us now turn to the status of the nondesignated complementizer *that*, as it occurs in (32) or (46a) in English. Again, we consider this issue to be of no major theoretical importance. Rochemont (1989:147) notes that there are speakers of English for whom a complementizer in embedded topic constructions is not necessary. Something similar appears to hold in Norwegian (Taraldsen 1986), Swedish (Platzack 1986), and Yiddish (Den Besten 1989), where lexicalization of a designated T is obligatory; in contrast to English, these languages exhibit obligatory V/2 movement.

In order to account for these differences, let us reconsider (61), which governs the relation between designation and visibility. It looks as though (61) contains parts that are universal, and parts that are subject to parameterization. Suppose now that in all the languages discussed so far, finite C is designated *if and only if* it is visible at S-Structure; that is, (61) holds for finite complementizers in general. In contrast, the relationship between designated and visible T is not so strict. In languages exhibiting obligatory V/2 movement (German, Scandinavian, Yiddish) T is designated *if and only if* it is visible; in English the requirement is weaker: *If* T is visible, *then* T is designated. This accounts for empty Ts in topic constructions. However, the cooccurrence of a lexical complementizer and a designated T in these structures (as observed in Scandinavian, Yiddish, and English) still poses a problem: C is filled with *that* although C cannot be designated. Here, it seems to us that the most natural account of the variable and incidental status of the phenomenon consists in assuming a PF rule of *that*-insertion which is, in a sense, the counterpart of the *that*-deletion rule operative in indirect questions in German and English. Thus, we propose that there is a PF rule “C → *that* / _____ topic.” This rule depends contextually on the presence of an overt topic in SpecT; it may apply obligatorily in some dialects/languages and optionally in others; some languages (such as German) may not employ it at all.²⁷

An immediate consequence of these assumptions is that the weaker requirement for T in languages without obligatory V/2 (like English) still rules out the cooccurrence of V/2 and a *wh*-phrase in SpecC; see (51c–d), repeated here in (65).

- (65) a. I don’t know [_{CP} what_i C [_{TP} T [_{IP} Mary is doing t_i]].
 b. *I don’t know [_{CP} what_i is [_{IP} Mary doing t_i]].

The same reasoning applies as in our discussion of (50b) in German: (65a) is well formed, since the *wh*-phrase agrees with a designated C, as required by (59); C is then deleted on the way to PF. However, no grammatical derivation exists for (65b). On the one hand, *what* must occupy SpecC (according to (59)). On the other hand, V/2 has applied;

²⁷ If this is correct, there is no deep reason for the complementary distribution of complementizers and V/2 in German. Indeed, Platzack (1991) argues that the cooccurrence of *daß* and V/2 is possible in earlier stages of German (as late as Early New High German).

hence, T is visible and therefore must be designated, so that (59) is violated. Finally, V-movement to C may not take place, since C is not featureless.

The assumption that C must be visible if and only if it is designated has an interesting consequence for the distribution of complementizer-less declarative clauses in English. According to Erteschik-Shir (1973:101–103), English exhibits “complementizer drop” in approximately the same contexts in which extraction is possible; Stowell (1981, 1985) argues that a complementizer can be missing only if C is governed. Consider some relevant examples:

- (66) a. He said [_{CP} (that) John did it].
 b. He resented [_{CP} *(that) John did it].
 c. [_{CP} *(That) John did it] impressed everyone.

Complementizer drop in English is possible in bridge configurations (see (66a)), but not, for example, in CP complements of nonbridge verbs (see (66b)) or in subject clauses (see (66c)). Thus, the distribution of complementizer drop closely resembles that of embedded topicalization in English, and that of embedded V/2 in German. This follows from the analysis given so far. Since designated C must be visible at S-Structure, and C cannot be deleted on the way to PF in (66) (because this rule was restricted to *wh*-contexts), we derive that T must be the designated head in (66). This is possible only if T is governed; and government of T by a licensing head occurs only in (66a).

3.8 Topic Islands

We now turn to an account of the topic island phenomenon. Consider, for example, (35) (repeated here).

- (35) a'. *What_i do you think [_{CP} t_i' that [_{TP} for Ben's car [_{IP} Mary will pay t_i]]]?
 b'. *That man_i I know [_{CP} t_i' that [_{TP} this book_j [_{IP} Mary gave t_j to t_i]]].

Since a topic in SpecT calls for agreement with a designated T, the designated head in CP must be T. Above we required that T (as a verbal head of CP) must be lexically governed, where government can be guaranteed only if CP and TP match. But clearly both specifier positions are nonempty in typical topic island configurations (e.g., in (35a') SpecC is occupied by *t_i'*, and SpecT, by the topic), so that matching and subsequent government of the head are blocked. Thus, topic island effects are reduced to a lack of T-licensing.²⁸ Direct movement in one swoop, on the other hand, would produce a strong Subjacency violation, with TP and CP as barriers and bounding nodes, and the matrix VP as a third bounding node by inheritance; we may conclude that the strength of this 3-Subjacency violation can be assimilated to an ECP effect.

²⁸ Note that derivation (35b') is also excluded as a PUB violation, because *t_i* is ambiguously bound by the topic in SpecT and by *t_i'* in SpecC.

3.9 Wh-Islands

Whereas topic islands are absolute, *wh*-islands are less strict. As pointed out by Fanselow (1987:56–64), topicalization of an object across a *wh*-island gives rise to only weak Subjacency effects in German; recall (52b).

- (52) b'. ??[_{CP}[_{TP} Radios_i weiß ich nicht [_{CP} wie (daß) [_{TP} t_i' T [_{IP} man t_i radios_{ACC} know I not how that one repariert]]]]].
repairs

Here, only two bounding nodes (CP and the matrix VP) intervene between *t_i'* and *Radios* at S-Structure (note that there is no matching of CP and TP), which gives a weak Subjacency effect. In contrast, long topicalization of adjuncts is severely ungrammatical in German:

- (67) *[_{CP}[_{TP} Deshalb_i weiß ich nicht mehr [_{CP} wer_j (daß) [_{TP} t_i' [_{IP} t_j t_i gekommen ist]]]]].
therefore know I no more who that
gekommen ist]]]]].
come is

Here, we are forced to construe the adjunct topic with the matrix clause in order to get an acceptable reading. As before, the CP barrier blocks antecedent government. But this time the intermediate trace is not an argument trace and therefore cannot be deleted on the way to LF; hence, (67) violates the ECP.²⁹

Another case to be considered is *wh*-extraction out of a *wh*-island. Müller (1989: 217) and Bayer (1990:22–33) have pointed out that long topicalization from an embedded *wh*-clause in German is far better than long movement of a *wh*-phrase. The latter process generally induces strong ungrammaticality, even in cases of object extraction (recall (53b), repeated here).³⁰

- (53) b. *Welches Radio_i weißt du nicht [_{CP} wie_j (daß) [_{IP} man t_j t_i repariert]]?
which radio_{ACC} know you not how that one repairs

The contrast between (52b) and (53b) immediately follows from the PUB. In examples

²⁹ The case of subject extraction from *wh*-islands in German is controversial. Fanselow (1987) and Webelhuth (1990) argue that subject movement as in (i) is impossible or highly marked, whereas Haider (1989) and Sternefeld (1990a) deny a subject-object asymmetry. The very fact that judgments vary to such a degree indicates to us that subject topicalization from a *wh*-island should not be regarded as an ECP violation. This follows, since the trace *t_i* in (i) is antecedent-governed by *t_i'*, which can delete on the way to LF (note that it is not a scrambling trace, hence not required at LF by Full Representation in German)—thus, an ECP violation does not occur.

(i) ??Linguisten weiß ich nicht mehr [_{CP} warum (daß) t_i' [_{IP} t_i hier angerufen haben]].
linguists know I no more why that here called have

³⁰ More or less the same constraint appears to be operative in other languages as well—for example, in English, where *wh*-extraction from *wh*-islands is tolerable only in infinitives, and even in Italian, where *wh*-islands appear to be less strict (see Rizzi 1982).

like (53b), the PUB does not permit an intermediate *wh*-trace in SpecT, so that a 3-Subjacency violation will result by crossing the barriers (and bounding nodes) TP and CP, and the bounding node VP. Topicalization in (52b), however, can use SpecT as an escape hatch, so that movement crosses only two bounding nodes, namely, CP and VP.

The theory presented so far makes an interesting prediction. Given that we have two escape hatches (SpecC and SpecT), we should find multiple extractions from a clause in German, as long as no topic island is crossed. This is confirmed by the data:

- (68) a. ??Dem Fritz_j weiß ich nicht [_{CP} was_i ART_{DAT} Fritz know I not what_{ACC} cfI [_{TP} t_j' du glaubst [_{CP} t_i' daß [_{TP} t_j' [_{IP} man t_j t_i kaufen sollte]]]]].
 that one buy-for should
- b. *Wem_j sagte sie [_{CP} t_j' [_{TP} ein Buch_i hätte sie gedacht [_{CP} t_j' daß [_{TP} t_i' [_{IP} man t_j t_i kaufen sollte]]]]]?
 who_{DAT} said she a book had she thought that one buy-for should

(68a) is only slightly marginal, which accords with its analysis as a mild Subjacency violation (with CP and VP as bounding nodes between *dem Fritz_j* and *t_j'*). (68b), on the other hand, is a strong licensing violation. The verbal designated head T of the (highest) embedded CP cannot be head-governed by the matrix V, as a result of nonmatching projections.³¹

3.10 Root Clauses

So far we have said nothing about specifier licensing in root clauses. First, recall that we stated in (59) that *wh*-operators must be licensed by a designated C-projection. As far as German is concerned, we proposed in (61) that there is a strict one-to-one correspondence between designated functional heads and S-Structure visibility. This would imply that C must also be visible in root clauses with a *wh*-phrase in SpecC. In root clauses, however, we never find any visible realization of nominal features; there do not appear to be genuine "root complementizers" in the Germanic languages (but see Noonan 1989 and Rizzi and Roberts 1990 for Québec French). It would seem, then, that the only way to make C visible in root clauses is by verb movement into C. Recall that this movement is excluded in embedded clauses, because embedded C, being the head of a CP governed by a matrix predicate, is not featureless. However, it seems natural

³¹ It is well known that *wh*-infinitives in English induce weaker island effects than finite *wh*-clauses (see Chomsky 1986). In Müller and Sternefeld 1990, it is argued that the CP/TP structure of infinitives differs from that of finite clauses in that a nonfinite T-projection is underspecified with respect to the features that identify its specifier and head positions; hence, the PUB does not block successive-cyclic *wh*-movement or topicalization via SpecT, and only a 2-Subjacency violation is derived in the case of extraction from *wh*-infinitives. For further discussion of the properties of infinitives in the present framework (concerning, among other things, licensing of *wh*-phrases and topics, and scrambling), see Müller and Sternefeld 1990 and Sternefeld 1990b.

to assume that C nodes in root clauses in the Germanic languages are purely “positional” categories—they do not bear independent features that in turn would block verb incorporation. Then, T-to-C movement is possible in root clauses (see Rizzi 1991a for related considerations).

Let us pursue this approach and assume that the following situation obtains in root clauses. Either C is the designated head (then, T-movement must apply in order to make C visible, and may apply because C is underspecified at D-Structure); or T can be the designated head by virtue of being licensed by the root. Then, the Licensing Condition (59) yields the following structures for root clauses in German:

- (69) a. $[_{CP}[_C e] [_{TP} Fritz_i \text{ sah}_j [_{IP} \text{ jeder } t_i t_j]]]$.
 Fritz_{ACC} saw everyone
 b. $[_{CP} Wen_i [_C \text{ sah}_j] [_{TP}[_T t_j'] [_{IP} \text{ jeder } t_i t_j]]]$?
 who_{ACC} saw everyone

In (69a) the topic *Fritz* occupies SpecT and is licensed by a designated and visible T. In (69b) the *wh*-phrase *wen* is licensed after T-to-C movement to the designated head C, which makes C visible.

Let us now turn to English. Since a designated T does not have to be visible here, topicalization in root clauses (as in (70a)) is well formed without movement of the auxiliary to T, as in embedded clauses. But why is subject-aux inversion obligatory in root *wh*-questions in English (see (70b–c))?

- (70) a. $[_{CP}[_{TP} \text{ To John}_i [_T e] [_{IP} \text{ Mary gave a book } t_i]]]$.
 b. $*[_{CP} \text{ To whom}_i [_C[_C e] [_{TP}[_T e] [_{IP} \text{ Mary gave a book } t_i]]]]$?
 c. $[_{CP} \text{ To whom}_i [_C[_C \text{ did}_j] [_{TP}[_T t_j] [_{IP} \text{ Mary give a book } t_i]]]]$?

The *wh*-phrase in SpecC must agree with a designated head C. This head must be visible. Since there are no matrix complementizers in English, C can become visible only via T-movement. If movement of the empty T occurs, this yields a complex C head $[_C[_T e]]$, which still is not visible. Therefore, movement of a *lexical* T is required in order to make (70b) well formed. Thus, the contrast between German and English in (69) and (70) eventually reduces to the fact that visibility and designation go hand in hand with respect to C and T in German, but with respect to C only in English.³²

³² Various questions remain. Consider, for example, the licensing of *wh*-subjects in root clauses of English. (i) does not violate the licensing condition (59) if we assume Chomsky's (1986:48–54) version of the vacuous movement hypothesis. As regards V/2 in root clauses with *wh*-subjects, Koopman (1983) and Rizzi (1989, 1991a), among others, suggest that (ii) can be accounted for by the ECP, whereas Koster (1987) argues that examples like (ii) should not be excluded by some general principle. We will leave this issue open.

(i) Who came?
 (ii) $(*)[_{CP} \text{ Who}_i [_C \text{ did}_j] [_{TP}[_{Top} t_j] [_{IP} t_i \text{ come}]]]]$?

3.11 Extraction from V/2 Clauses

The PUB can also be invoked to account for a peculiar constraint on successive-cyclic extraction in German, which has been discussed by Tappe (1981), Haider (1984), Reis (1985), and Staudacher (1990), among others. So far, we have given examples for successive-cyclic *wh*-movement and topicalization in German that involve extraction only into V/2 clauses (from either *daß*-clauses or V/2 clauses); see (6) and (42). However, an interesting asymmetry arises if successive-cyclic extraction settles down in (or crosses) a verb-final clause. On the one hand, movement steps from verb-final clauses into verb-final clauses again are possible:

- (71) a. Ich weiß nicht [_{CP} wen_i C du meinst [_{CP} t_i' daß der Fritz t_i mag]].
 I know not who_{ACC} you think that ART Fritz likes
 b. Fritz_i glaube ich [_{CP} daß t_i' sie sagte [_{CP} daß t_i' Ede t_i mag]].
 Fritz_{ACC} believe I that she said that Ede likes

But extraction from V/2 clauses into verb-final clauses leads to strong ungrammaticality:

- (72) a. *Ich weiß nicht [_{CP} wen_i C du meinst [_{CP} t_i' mag der Fritz t_i]].
 I know not who_{ACC} you think likes ART Fritz
 b. *Fritz_i glaube ich [_{CP} daß t_i' sie sagte [_{CP} t_i' mag Ede t_i]].
 Fritz_{ACC} believe I that she said likes Ede

Thus, the correct descriptive generalization seems to be that extraction from V/2 clauses must go into V/2 clauses, whereas extraction from verb-final clauses may go into both V/2 and verb-final clauses. Since an analysis of (72) in terms of a violation of locality constraints does not suggest itself, let us pursue here an idea put forth in Stechow and Sternefeld 1988, according to which (72) should be analyzed as a case of improper movement. However, (72a–b) do not violate the PUB, as it stands—our classification of landing sites is not yet fine-grained enough to capture the difference between verb-final and V/2 clauses.

Viewed as sets of contextual features, the relevant landing sites of movement in (71)–(72) bear the features [+ \bar{A} -Spec] and, in addition, either [+CR] (“C-related,” i.e., SpecC) or [+TR] (i.e., SpecT). Now, Sternefeld (1989) and Rizzi (1991b) observe that the preverbal position(s) of V/2 clauses appear to differ from those of verb-final clauses in an interesting respect: besides being \bar{A} -positions, the specifiers of V/2 CPs in German also may acquire properties of A-positions, more specifically, of specifier positions of a lexical head. Let us thus assume that this property can be viewed as a third feature [+LR], that is, “lexically related.” Hence, \bar{A} -specifiers of V/2 clauses bear the feature [+LR], in addition to either [+CR] or [+TR], whereas no such feature is present in [+CR] or [+TR] \bar{A} -specifiers of verb-final clauses. Let us now slightly modify the PUB, to the effect that movement from an α -position into a β -position is possible if and only

if the specification of α (in terms of positive features) is a (possibly improper) subset of that of β . Note that this has no unwelcome consequences for any of the applications of the PUB discussed so far—movement from a [+CR] to a [+TR] position, for instance, will invariably result in a PUB violation, because a position bearing the feature [+CR] cannot be a subset of a position bearing the feature [+TR] (these features are mutually incompatible by definition).

With this in mind, consider (72) again. In (72a) there is movement from a [+LR] SpecC position into a SpecC position of a verb-final clause, which thus lacks the feature [+LR]. Hence, the position occupied by t_i' cannot be described as a subset of the position of *wen*, so that the PUB is violated. Similarly, t_i' in (72b) occupies a SpecT position with the feature [+LR], whereas t_i'' is located in a SpecT position that lacks this feature, in violation of the PUB. On the other hand, successive-cyclic extraction from verb-final clauses, or into V/2 clauses, does not violate the PUB. In (71a), for example, both t_i' and *wen* occupy SpecC positions that lack the feature [+LR], and in (71b) t_i' and t_i'' are in SpecT positions without the feature [+LR]; these positions are therefore proper subsets of the SpecT position occupied by *Fritz*, which is a [+LR] SpecT position. Similarly, it is easily verified that successive-cyclic extraction of *wh*-elements and topics from *daß*-clauses and V/2 clauses into V/2 clauses, as in (6) and (42), does not violate the PUB—these movements do not involve steps from [+LR] positions into positions that lack this feature.

In conclusion, of the four logically possible combinations only movement from a V/2 clause into a verb-final clause is ruled out by the PUB, because only in this case is there movement from one position α into a second position β , without the features of α being a subset of the features of β . Note finally that according to this analysis, SpecC and SpecT in V/2 clauses both have to bear the additional feature [+LR], although the additional impact of a lexically related position has been justified only for topicalization—only SpecT is the specifier of a (derived) lexical category, after V/2 movement. But in order to provide SpecC with this feature, we can rely on a qualification of the matching formalism: Two specifiers can match only if they share appropriate features; in particular, the matching specifiers must be identical with respect to the features [+ \bar{A} -Spec] and [+LR]. Given this additional requirement, the licensing condition on embedded V/2 clauses (which implies that TP must match with CP, so that T can be status-governed) in addition implies that the [+LR] specification of SpecT carries over to SpecC, so that (72a) (= *wh*-movement) and (72b) (= topicalization) are ruled out in exactly the same way.

4 Other Movement Types

In the remainder of this article we briefly discuss other types of movement and show that they are restricted by the PUB.

4.1 Extraposition

Since Ross 1967 it has been recognized that rightward movement is clause-bound; this constraint is known as the *Right Roof Constraint*. Paraphrasing this condition on upward boundedness, Van Riemsdijk and Williams (1986:30) state that “no element that is moved rightward by a transformation may be moved out of the next higher node S.” As an illustration, consider (73), from Perlmutter and Soames 1979:302.

- (73) *Tom always maintains [_{CP} more information t_i has come to light t_i'] whenever he is asked about it [than Marcia told you]_i.

As Van Riemsdijk and Williams note, “the upward boundedness issue is currently one of the standard unsolved problems,” the problem arising from “the possibility of successive cyclic movement.” Here, Van Riemsdijk and Williams seem to have in mind the use of Comp (i.e., SpecC) as an escape hatch for extraposition. The problem dissolves, however, if we classify extraposition sites as the rightward adjunction sites of NP, VP, and IP. Given that these adjunction sites constitute their own class of positions—different from the SpecC position and the scrambling positions considered above—the clause-boundedness of extraposition now follows straightforwardly from the PUB, much in the same way as the clause-boundedness of scrambling in German.³³

4.2 Quantifier Raising

Likewise, it “seems to be a fact about natural languages that quantifiers are clause-bound, i.e. their scope cannot extend beyond the minimal S in which they are generated” (Enç 1988:249). Chomsky (1975:105) notes that “quite generally quantifiers within an embedded sentence are within the scope of higher quantifiers, and are in fact bound within the embedded sentence itself.” May (1985:45), however, argues explicitly against the clause-boundedness of his rule of quantifier raising QR, because “the ambiguity of [(74)] sufficiently argues for the possibility of QR extracting phrases from tensed complement domains to the matrix . . .” (p. 46).

- (74) Who do you think everyone saw at the rally?

But in fact May does not give any explicit semantics, either for question formation or for the meaning of *wh*-phrases. Instead, he tries to justify a structure like (75) as an LF representation for (74) on purely syntactic grounds.

- (75) who_i do [_S everyone_j [_S you think [_{S'} t_j saw t_i at the rally]]]

³³ Of course, *wh*-movement of the subject from a VP-adjoined position is possible in languages like Italian (see Rizzi 1982). This, however, is compatible with the PUB if we make the plausible assumption that, in subject inversion constructions, SpecI is occupied by an expletive *pro*, rather than by a trace (see Rizzi 1986, among others).

Williams (1986) argues against representations of this kind; one of the reasons why he finds “May’s account of his paradigm in terms of scope suspect is that for bisentential cases, it requires assigning wider scope to *everybody* than that quantifier can normally take” (p. 297). Indeed, Engdahl (1986) has shown that a meaningful semantic representation of these types of clauses does not involve biclausal QR at all. In order to demonstrate this more clearly by using overt variable binding to indicate the purported scope of a quantifier, consider the following constructions from Geach 1962 and Engdahl 1986: 183, 179:

- (76) a. [Which relative of his_i]_j do you expect every Englishman_i to admire most t_j? (Answer: His_i mother.)
 b. Who_j do you think t_j should repair each TV set_i? (Answer: The man who built it_i.)
 c. The woman every Englishman_i admires most is his_i mother.

Following Engdahl (1986), an appropriate semantic representation of the relational readings of the questions in (76) is something like (77) (where we have deliberately reduced her formulas to a more extensional variant of predicate logic).

- (77) a. $\lambda p((\exists f_{(e,e)})(\forall x)(\text{relative-of}'(f(x)) \ \& \ p = \ \hat{\text{you-expect}}'_{\text{CP}}(\forall y)(\text{englishman}'(y) \rightarrow \text{admire}'(y, f(y)))) \ \& \ \hat{p}))$
 b. $\lambda p((\exists f_{(e,e)})(\forall x)(\text{person}'(f(x)) \ \& \ p = \ \hat{\text{(you-think}}'_{\text{CP}}(\forall y)(\text{TV-set}(y) \rightarrow \text{should repair}'(f(y), y)) \ \& \ \hat{p}))$

Elaborating on Engdahl’s analysis, Stechow (1990) has shown that there is a systematic way to derive these representations via a level of LF. The details of such an LF do not concern us here, except for the fact that, as indicated by the CP-labeled brackets in (77), it is not necessary (or even desirable) to give the quantified NPs *every Englishman* or *each TV-set* syntactic scope over the embedded CPs. With respect to Geach’s example (76c), Chomsky (1981:316, n. 4) remarks that “the pronoun is understood as somehow within the scope of the quantifier though it is not formally within its scope.” Again, Stechow has shown that an adequate semantic interpretation can do without QR. In fact, his analysis—which proceeds by assigning truth conditions to the effect that the set of functions in $\{f \mid [\text{CP}(\forall y)(\text{englishman}'(y) \rightarrow \text{admire}'(y, f(y)))] \ \& \ (\forall x)(\text{woman}'(f(x)))\}$ contains the (partial) function that assigns one’s mother to each individual—is corroborated by the observation that analogous examples like (78), which cannot be analyzed along the lines suggested by Stechow, are ungrammatical.

- (78) *This/Every/A woman every Englishman admires most is his mother.

Any reasonable way to interpret (78) within the framework proposed by Stechow (1990) seems to require the additional means of QR out of a relative clause. Clearly, the ungrammaticality of (78) indicates that this option does not exist, again supporting the

conclusion that QR must be clause-bound. Since there are several additional possibilities to get around the issue of syntactic wide scope in a number of further cases (e.g., by reconstruction or scopeless interpretation as in Hintikka's game theory or Kamp's (1971) theory of double indexing), we conclude that the clause-boundedness of QR can be maintained and should emanate from general principles governing the nature of QR.

Let us now try to derive the clause-boundedness of QR from the PUB. So far, we have assumed that the PUB applies at LF in some languages, but not in others. But, in order to account for the strict locality of the LF movement type QR, it looks as though we must assume that the PUB universally applies at LF. This apparent contradiction dissolves, however, if we take into account that the data from Russian and Korean presented in section 2 do not actually imply that LF movement could be ambiguous. Rather, they suggest that S-Structure movement of one type may in fact be followed by LF movement of another type—so that both types of movement must proceed unambiguously only on a given level of representation. Let us therefore replace our earlier assumption that the PUB may or may not apply at LF by the idea that the PUB may or may not check S-Structure movement at LF. If it does, we will say that the PUB is *projective*; if it does not, the S-Structure part of a chain will not be reconsidered at LF, and the PUB will be said to be *nonprojective*. We established above that the PUB in German and English is projective, whereas in Russian, Japanese, and Korean scrambling chains are not checked in LF, because the PUB is nonprojective, so that—apart from the variable to be checked by the PUB—all other S-Structure positions of chain formation will be ignored by the PUB at LF. Thus, scrambling chains in, say, Korean will not be subject to the PUB at LF, and Full Representation (30) does not apply to these chains.

Thus, all the previous results still hold; in addition, however, the shift of perspective makes it possible to assume that the PUB universally applies to chains generated (by QR) at LF. Now, in order to account for the differences between scrambling and QR, the only additional modification called for concerns adjunction sites. So far the notion "possible adjunction site" has been used in a level-neutral way. Now we propose that this notion should be relativized to levels of representations. Above we observed that in Russian the adjunction site of CP is a possible landing site *for S-Structure movement*. In contrast, however, the universal character of the clause-boundedness of QR suggests that CP never constitutes a possible adjunction site *for LF movement*.

Since QR chains are built up at LF, this implies that the strict clause-boundedness of QR can now be derived without further stipulations. The proof is analogous to the derivation of ECP effects for scrambling in German, except for the difference that the relevant chains to be checked *at LF* are generated by QR (and by Full Representation) at LF, rather than by scrambling at S-Structure. For the derivation of ECP effects for QR this difference is immaterial, however. Thus, if it is true that there is no parametric variation in the use of adjunction sites for QR, language-particular differences between scrambling and QR can only derive from properties of scrambling. Hence, the observed differences between QR and scrambling in languages other than German will result from

the setting of two parameters: the availability of additional adjunction sites for scrambling, and the (non)projectiveness of scrambling chains in the language under discussion.

4.3 Raising and Superraising

So far we have said nothing about the definition of variables. For present purposes, let us assume that variables are defined contextually, as traces that are locally \bar{A} -bound. Then, the impossibility of superraising examples like (79a) follows from the PUB, since t_i is classified as a variable and is simultaneously bound by t_i' in SpecC and by *a man* in SpecI. An inverted combination of raising and movement to SpecC as in (79b), on the other hand, does not violate the PUB— t_i and t_i' , not being variables, may be ambiguously bound, and t_i'' is bound from SpecC only.³⁴

- (79) a. *A man_i seems [_{CP} t_i' (that) [_{IP} there was killed t_i]].
 b. Who_i [_{IP} t_i'' seems [_{IP} t_i' to have been kissed t_i]]?

4.4 Dative Shift

Stowell (1981), Kayne (1984), Baker (1988), and others have observed that \bar{A} -movement may not apply to indirect objects that have undergone dative shift in English:

- (80) a. Who_i did John give a book [_{PP} to t_i]?
 b. *Who_i did John give t_i' a book t_i ?
 c. *Who_i did Mary say [_{CP} t_i'' that she gave t_i' a present t_i]?
 d. *John_i, Mary said [_{CP} t_i'' that she gave t_i' a present t_i].

Larson (1988) argues that dative shift in English involves syntactic movement of the indirect object into a Case-marked position; Fanselow (1991:100–109) and Müller (1992b) present evidence that dative shift is Case-driven movement to an \bar{A} -position (rather than to an A-position, as assumed by Larson). Let us furthermore postulate that this Case-marked \bar{A} -position is the specifier of a functional category that intervenes between IP and VP (see Müller and Sternefeld 1991 for details). Then, t_i in (80), although Caseless, qualifies as a variable and is subject to the unambiguous binding requirement. Hence, the PUB is violated in (80b–d) (because dative movement feeds another type of \bar{A} -movement), but not in (80a) (because dative shift has not applied).³⁵

³⁴ In Chomsky's (1981) theory, superraising as in (79a) could be excluded as a violation of Principle C. Given that this construction is also ruled out by the PUB, one may ask whether Principle C is still necessary as a constraint on traces of \bar{A} -movement. The relevant cases to be explained are strong crossover constructions. This issue is tackled in detail in Müller 1992b, where it is argued that, given a slightly more elaborate concept of "variable," Principle C (more generally, binding theory) for traces can be dispensed with, because the PUB subsumes strong crossover effects: whereas *improper movement* can be traced back to ambiguous binding of a variable by two elements of *one and the same* chain, a *strong crossover* effect arises if there is ambiguous binding of a variable (in the domain of the head of its chain) by two elements that occur in *different* chains.

³⁵ For more detailed (and cross-linguistic) discussion of dative movement and unambiguous binding, see Müller 1992b.

4.5 Head Movement

Li (1990) argues that a lexical head cannot first move into a functional category and then proceed further into a lexical category again. This case looks like improper head movement; and indeed, the restriction follows from the PUB: the first movement is to a [+functional] category, and the second movement would be to a [+lexical] category.

5 Conclusion

In this article we have shown that a modular theory of movement that sorts out different processes according to their different landing sites proves successful in blocking ungrammatical extractions of various sorts. In section 2 we argued that scrambling and *wh*-movement must be strictly kept apart; this follows from the PUB. In section 3 the analysis was extended to topicalization. We argued that topicalization differs from both scrambling and *wh*-movement. This was accounted for by introducing a new analysis of topicalization, V/2 movement, and clausal structure, according to which there are always two clausal functional heads present in Germanic: a nominal complementizer C, and a verbal head T. On the basis of this analysis, the PUB was shown to play a crucial role in deriving differences between topicalization, scrambling, and *wh*-movement. Finally, in section 4 we argued that traces of other movement types obey an unambiguous binding requirement, too. This derives locality constraints on extraposition, quantifier raising, head movement, and raising; moreover, it accounts for the impossibility of \bar{A} -movement of a dative-shifted indirect object in English in a natural way. Thus, we end up with a theory of \bar{A} -movement that does not involve any construction-specific assumptions. Where scrambling, *wh*-movement, topicalization, and other types of movement behave alike, as well as where they differ, they obey identical constraints—most notably, the ECP, the Subjacency Condition, and the PUB. \bar{A} -movement asymmetries, under this view, can simply be conceived of as *epiphenomena* of the requirements of general principles of Universal Grammar.

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