

Missing Superiority Effects: Long Movement in German (and other languages)

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0. Introduction

The presence of a (categorical) superiority effect in English, and its absence in languages like German, Polish, or Spanish, exemplified by the contrast between (1) and (2), still poses quite a challenge in the formulation of a comparative theory of syntax. The pattern we observe in English with its fairly strict ban against crossing movement seems rather rare among the world's languages, yet most accounts of the contrast concerning superiority have English represent the default case. Some more recent approaches have abandoned this assumption (Haider 2004, Chomsky 2005), and they also do not attribute the superiority effect to the operation of a single constraint, cf. Haider (2004) for details of such a model.

- (1) a. (I wonder) who said what
b. *(I wonder) what who said t
- (2) a. (*Unklar ist*) *wer was gesagt hat*
unclear is who what said has
b. (*Unklar ist*) *was wer gesagt hat*
"It is unclear who said what"

Most discussions of comparative aspects of superiority concentrate on the interaction of clausemate wh-phrases, like the ones in (1) and (2). Contrasts such as (3) and (4) rarely figure in crosslinguistic investigations, and probably, this is so because not much is known about details of the status of (5) and (6) in languages without clausemate superiority effects. The goal of the present paper therefore is to present some experimental data on the acceptability of crossing movement in multiple questions involving wh-phrases that originate in different clauses (exam-

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ples such as (5b) and (6b)), and to discuss the consequences of these for models of superiority and the theory of grammar.

- (3) a. who did you persuade t to buy what
 b. *what did you persuade who to buy t
- (4) a. who did you tell that you saw what
 b. *what did you tell who that you saw t
- (5) a. *wem hat er empfohlen was zur Safari mitzubringen*
 who has he recommended what to-the safari to bring
 b. *#was hat er wem empfohlen zur Safari mitzubringen*
 "who did he recommend to bring what to the safari?"
- (6) a. *wem hat er t geglaubt dass er was tun kann*
 who has he believed that he what do can
 b. *#was hat er wem geglaubt dass er t tun kann*
 "who did he believe that he could do what"

After a theoretical discussion of (1) and (2), we report three acceptability rating experiments focusing on German sentences in which a *wh*-phrase from an infinitival complement clause crosses a matrix *wh*-question (as in (5b)). The results of these experiments show that non-crossing movement (as in (5a)) is indeed more acceptable than crossing movement (5b) even in a language like German that has no sharp superiority effects among clausemates. However, our experimental evidence also shows that the difference between crossing and non-crossing movement is not a superiority effect in a strict sense. Rather it must be explained in terms of the general reduction of acceptability in sentences involving long *wh*-movement. Our experiments lend support to the view that there is no direct superiority-related effect in the interaction of matrix *wh*-phrases and *wh*-phrases embedded in infinitival complements in German. In that sense, they also suggest a reinterpretation of the low acceptability of (6b) in terms of an effect of long movement rather than in terms of superiority, a view that is compatible with the results of a small internet based survey. Taken together, this implies that German tolerates crossing movement in general, not unlike Swedish and Icelandic, but quite in contrast to English. We conclude the paper with a short theoretical speculation as to how this difference can be captured in the minimalist proposals of Müller (2004) and Chomsky (2005).

1. Superiority Effects for Clausemates

Most accounts of the different acceptability of structures with a wh-phrase crossed over by another in English and German subscribe to the view that the greater degree of constituent order freedom in German is responsible for the grammaticality of (2b). This was first proposed by Haider (1981), the seminal study of the cluster of syntactic properties in which German and English differ (cf. also Haider 1986, 1993). There are, essentially, two ways of spelling out the basic idea that German allows crossing movement because of its greater freedom of word order.

Fanselow (1997) suggested that the superiority effect in (1b) is caused by a strict version of the Minimal Link Condition (Chomsky 1995), see (7) for a somewhat simplified version. Because of (7), a [+wh]-Comp cannot attract a wh-object in (8a) if the subject is a wh-phrase, too, since the subject c-commands the object. In German, (2b) is fine because objects can be *scrambled* to a position c-commanding the subject. Relative to the scrambled order (8b), the object is the only category that can move to a wh-Comp if both the subject and the object are wh-phrases.

(7) X cannot attract α if there is a β that c-commands α and can also be attracted by X.

(8) a. [Comp ... [subject ... [object ...]]]

b. [Comp ... [_X object [_Y subject ...]]]

In fact, the presence of scrambling is a good predictor for the absence of superiority effects, in the sense that scrambling languages typically tolerate the movement of wh-objects across wh-subjects (Fanselow 2004). Furthermore, the interpretive side-effects of crossing movement can be analysed as consequences of the pragmatic conditions for scrambling in such models. Only Russian (see Meyer 2004) and Tibetan (Fanselow 2004) may require additional assumptions.

In models such as the one proposed by Fanselow (1997), there is no crossing wh-movement in languages such as German either. Wh-movement affects the highest wh-phrase only, but scrambling may have made an object c-command the subject. It is tempting to analyse the contrast in (9) as evidence for such models: certain PPs (*von den Studenten*) can be split off a wh-phrase (9b), but not if a further wh-phrase intervenes between the PP and the wh-pronoun (9c). If the position of the split-off PP shows where the wh-movement originated, we can conclude that wh-movement must be able to start in a scrambled position, and the ungrammaticality of (9c) suggests that wh-objects cannot move past wh-subjects when movement originates in the lower base position of the object. However, Pesetsky (2000) argues that (9c) can be reinterpreted as an intervention effect in the sense of Beck (1996). Therefore, the pattern in (9) is compatible with the view that wh-phrase can cross other wh-phrases in wh-movement steps in German.

- (9) a. *Wen von den Studenten hat denn wer im Sommer prüfen*
 Who of the students has ptc who.nom in-the summer examine
wollen
 wanted?
- b. *Wen hat denn von den Studenten wer im Sommer prüfen wollen?*
- c. **Wen hat denn wer im Sommer __ von den Studenten prüfen wollen?*
 "Who wanted to examine which one of the students in summer? "

While the evidence from German is thus not conclusive, it is not clear how MLC-based proposals could be extended to Scandinavian languages such as Swedish or Icelandic that lack superiority effects in the absence of scrambling, though an extended version of Object Shift may make the object c-command the subject *before* wh-movement (see Müller (2004) for such a suggestion under a different set of assumptions)¹. In Spanish, subjects can stay in vP in general, and wh-subjects in that position can be crossed over by wh-objects (see, e.g., Hornstein 1995), in spite of the fact that the language has neither scrambling nor Object Shift. Because of these considerations, and the empirical facts presented below, we believe the MLC-based account of superiority effects should not be pursued any further.

An alternative way of dealing with superiority effects interprets them as consequences of absolute constraints on movement such as the ECP (Chomsky 1981), the theory of barriers (Müller 1995), or Chomsky's Phase Impenetrability Condition PIC (Müller 2004). Simplifying Müller's (2004) ideas a bit, we can say that a head H such as Comp in (10) cannot attract any phrase Y from which it is separated by a 'phase' boundary, unless Y is a specifier (or the head) of the intervening phase. If vP and CP are phases (see Chomsky 2005), the PIC implies that Comp cannot attract wh-2 in (10a), which yields the standard superiority effect. If the object has been scrambled to a specifier position of vP as it has in (10b), the PIC can no longer block its movement, so that both the subject and the object can move to Spec,CP in (10b). See Müller (2004) for such a proposal.

- (10) a. Comp [_{TP} wh-1 ... [_{vP} ... [_{VP} V wh-2]]]
- b. Comp [_{TP} wh-1 ... [wh-2 [_{vP} ... [_{VP} V]]]]]

One fatal problem for the simplified version presented so far lies in the fact that it would also prevent the movement of a wh-object across a non-wh-subject in non-scrambling languages. The effects of the PIC do not depend on the nature of in-

¹ As Jacek Witkoś points out in personal communication, Object Shift would not have the desired effect if it places the object into the periphery of VP rather than vP, below the root position of the subject, as discussed in Chomsky (2005).

intervening categories – wh-2 is inaccessible to Comp because of the intervening phase boundary in (10c) as much as it is in (10a)

(10) c. Comp [_{TP} DP ... [_{VP} ... [_{VP} V wh-2]]]

Recent minimalist models solve this difficulty in the spirit of a suggestion made in Chomsky (1986), viz., by assuming that wh-movement proceeds through the outer specifier of vP. The structure allowing object-wh-movement is thus (10d), in which the PIC does not block the movement of wh-2 because wh-2 is a specifier of the intervening phase.

(10) d. Comp [_{TP} DP ... [_{VP} wh-2 [_{VP} ... [_{VP} V]]]]

If wh-objects can move via the specifier of vP, one wonders why they cannot land there when the subject is a wh-phrase, too. In that case, we would arrive at the constellation (10b) in non-scrambling languages, as well, so that object wh-movement crossing wh-subjects is predicted to be grammatical in general.

Chomsky (2005) accepts this consequence and concedes that the English superiority effect cannot be derived directly from principles of narrow syntax². Notorious counterexamples such as (11) may make one feel inclined to accept this conclusion.

- (11) a. which book did which man buy?
 b. I know what everyone was supposed to do, but what did who actually do?
 c. who wonders what who brought to the party?

However, as Müller (2004) points out, the status of crossing wh-movement is intimately linked to the status of cyclic movement to intermediate landing sites in such minimalist models. Intermediate movement steps must not be allowed to apply freely. Untriggered movement does not fit the overall architecture of a minimalist grammar, and if phrases could move freely to intermediate landing sites, sentences such as (12) (and many other incorrect structures) could not be blocked.

(12) *Who thinks [who he has invited t]

² This is compatible with the view that superiority effects arise in the complex interaction of principles of grammar not concerned with locality and phases, as suggested by Haider (2004). Sag et al (2005) propose to reinterpret the ban against crossing movement as a processing effect, while Shan & Barker (2005) locate the effect in the interpretive system. By rooting superiority effects deeply into the semantic component, one probably makes it quite difficult to explain crosslinguistic variation.

Müller proposes an elegant principle, *Phase Balance* (PB), that imposes far-reaching restrictions on the applicability of intermediate movement steps. The basic idea behind PB is that intermediate movement of an α -phrase X to Y is, in principle, forbidden. It is triggered in those structures only in which no α -phrase but X can be moved to the specifier position of a higher head H that requires an α -specifier, see Müller (2004) for details³.

For wh-phrases separated by a phase boundary as in (10a), PB blocks the movement of the lower wh-phrase across the higher: a c-commanding wh-phrase suppresses cyclic movement of lower wh-phrases, so that the latter cannot move to the phase edge, the only location from which it could be attracted to higher positions. When two wh-phrases are part of the same phase, the higher one can be crossed by the lower one. The wh-phrases can also cross each other if they are separated by one phase boundary, with the lower wh-phrase reaching the phase edge by having undergone some movement like scrambling or Object Shift different from wh-movement, as in (10d). The basic observations for clausemate wh-phrases are thus explained.

Chomsky (2005), on the other hand, imposes no explicit formal restrictions on the movement to intermediate positions. He assumes that movement applies only if it has an effect on the output, both relative to the semantic and the phonological interface. The additional intermediate movement steps required in crossing movement constellations may be in need of justification at the semantic interface. Crossing and non-crossing movement yield different interpretations (see Pesetsky 2000 for a recent summary) so that the superiority contrasts could find an explanation at a rather shallow level of interpretation, but the exact mechanics of such an account would still have to be identified.

2. Extractions from Infinitives crossing matrix-wh-elements

As pointed out above, PIC effects do not arise in the interaction of wh-phrases when the lower wh-phrase has been scrambled to the edge of the phase separating them (as in (13)) in Müller (2004).

(13) Comp [_{TP} wh-**subject** [Tense [_{VP} **object** [_{VP} t [V [_{VP} V t]]]]]]

To the extent that scrambling cannot place a wh-phrase from an embedded clause into the embedding clause, one might hope to be able to decide between the liberal (Chomsky) and restricted (Müller) theories of intermediate movement steps

³ *Phase Balance* implies that cyclic wh-movement proceeds via the outer edge of each maximal projection between the root position and the landing site. We will ignore this consequence here. Our discussion of English and Swedish thus (slightly) distorts the analysis of Müller.

on the basis of the status of crossing movement involving wh-phrases from different clauses.

That German does not exhibit superiority effects when a wh-phrase originating in a control infinitive crosses a matrix wh-phrase was claimed by Fanselow (1991: chapter IV.2), Kim & Sternefeld (1997) and Haider (2000) on the basis of data such as (14). Haider (2000) observes that crossing constructions such as (14b) become less acceptable when the two wh-phrases agree in animacy and case, and he argues that this is due to increased processing difficulty.

- (14) a. *wen hat er überzeugt was zu kaufen*
 who.acc has he convinced what to buy
- b. *was hat er wen überzeugt zu kaufen*
 what has he who.acc convinced to buy
 "who did he convince to buy what?"

- Experiment 1

In order to find out whether judgments that do not differentiate between (14a) and (14b) are reliable, we conducted three acceptability rating experiments. The experimental items of EXPERIMENT 1 were constructed with matrix verbs such as *helfen* “help” that allow an infinitival complement and a matrix object. The infinitive clause was placed to the right of the non-finite verb (the extraposition location) and contained an adjunct PP in addition to an object, in order to exclude a clause-union interpretation.

The first factor (CASE) of the experiment concerned the case assigned by the matrix verb to its object. In half of the items, the matrix verb assigned dative case to its DP-object (as with *helfen* “help”), in the other half, it assigned accusative case (as with *informieren*, “inform”). The complement clause verb assigned the case not used in the matrix clause. The experimental items were constructed with verbs that could figure both in the matrix and the complement clause, so that the first half of the items had verbs in the complement clause that appeared in the matrix clause in the other half of the items, and vice versa. The case difference of the two DP-objects was necessary in order to avoid the processing difficulty mentioned above that may arise when the two wh-phrases bear the same case. Both objects were animate wh-pronouns (*wen*=who.acc, *wem*=who.dat).

The second factor (CROSS) related to superiority. In one half of the items, the higher (=matrix) object was fronted, in the other half, the lower (=complement) object was moved to the left periphery. The two factors CASE and CROSS yielded the four experimental conditions exemplified in (15): DATIVE fronted in non-crossing (CROSS -) movement (15a), DATIVE fronted in crossing (CROSS +) movement (15d), ACCusative fronted in non-crossing movement (15c), and ACCusative fronted in crossing movement (15b).

- (15) a. *Wem hat er geholfen, wen über den Tod der*
 Who.dat has he helped who.acc about the death the.gen
Angehörigen zu informieren DAT SHORT
 relatives to inform
 “who has he helped to inform who about the death of the relatives?”
- b. *Wen hat er wem geholfen, über den Tod der Angehörigen zu informieren*
 (=15a) ACC LONG
- c. *Wen hat er informiert, wegen dem Tod der Angehörigen*
 Who.acc has he informed because the death the.gen relatives
wem zu helfen? ACC SHORT
 who.dat to help?
 “who has he informed that he helped who because of the death of the relatives?”
- d. *Wem hat er wen informiert, wegen dem Tod der Angehörigen zu helfen?*
 (=15c) DAT LONG

We were interested in the effects of the factor CROSS that distinguished between crossing and non-crossing movement. In the light of the claims in the literature referred to above, one would not expect to see a difference in acceptability between the crossing and non-crossing conditions.

16 experimental items (4 items/condition) and 72 distractor items (among which there were 16 multiple questions formed with wh-subjects and wh-adjuncts) were presented in pseudorandomized order on a questionnaire. They were rated by 32 participants (students of the University of Potsdam, all native speakers of German) on a 7-point scale (1=completely ungrammatical, 7= fully grammatical). The mean acceptability for the four conditions is given in table 1:

	DAT fronted	ACC fronted
CROSS: -	3.95 (15a)	3.76 (15c)
CROSS: +	1.87 (15d)	2.38 (15b)

Table 1: Mean acceptability in Exp.1

There was a significant main effect of the factor CROSS: The question of whether the lower or the higher wh-phrase was fronted was relevant for acceptability: non-crossing movement (mean acceptability 3.85) was more acceptable than sentences in which the lower wh-phrase was moved and crossed the higher wh-phrase (mean acceptability 2.12) ($F_1(1,31)=52,97$; $p < .001$; $F_2(1,15) = 116,15$; $p < .001$.) There was no main effect of the case of the fronted wh-phrase (with a mean acceptability of 3.07 vs. 2.91 for ACCUSATIVE and DATIVE initial structures, respectively: $F_1(1,31)=1,82$; $p > .10$; $F_2(1,15)=1,13$; $p > .10$). However, CASE and CROSS interacted in a significant way ($F_1(1,31)=17,96$; $p < .001$; $F_2(1,15) = 12,40$; $p < .01$): the difference between crossing and non-crossing movement is smaller in the accusative condition (3.76 vs. 2.38) than in the dative condition (3.95 vs. 1.87).

At first glance, the main effect of CROSS in EXP. 1 is surprising in the light of the claims in the literature concerning the status of (15). After all, structures in which a wh-phrase from a lower clause crosses a matrix wh-phrase were less acceptable than structures in which the matrix wh-phrase was moved to Spec,CP. It is tempting to relate this effect directly to the crossing nature of movement, but there is a possibly confounding factor involved in EXP.1: the crossing movement is also an instance of long wh-movement, whereas the non-crossing movement fronted the wh-phrase within its own clause, i.e., it is an instance of short wh-movement. Since long movement is normally less acceptable than short movement, the difference in the distances covered rather than the difference concerning crossing may be responsible for the lower acceptability of the CROSS + conditions. In order to control for this possibility, we constructed a second experiment from the material used in Exp. 1.

Before we can present this second experiment, we must comment on the significant interaction between CROSS and CASE in EXP.1. Probably, we are confronted here with the type of effect discussed in detail in Fanselow & Frisch (2006): The presence of a local structural ambiguity in the initial part of a sentence may decrease or increase the acceptability of the sentence. In an acceptability rating experiment involving relative pronouns that had been extracted from a complement clause, Fanselow & Frisch (2006) found that participants rated sentences in which the relative pronoun could temporarily be analysed as a matrix clause constituent as more acceptable than structurally identical sentences in which no such local ambiguity arose. Exactly the same could also be observed in an experiment concerned with wh-questions.

In the light of these results, the higher acceptability of long movement constructions in the accusative-initial condition (15b) could be understood as an effect of a local ambiguity. Most German verbs taking an infinitive complement and governing dative case allow the replacement of the infinitive by an accusative DP argument, and many of them even accept an animate accusative object. 15 of the 16 dative governing verbs used in Exp. 1 allow an accusative DP object, and 10 of them were even compatible with an animate object in the dominant (*empfehlen*

‘recommend’, *vorschlagen* ‘propose’) or in a restricted interpretation (*versprechen* ‘promise’ (as a partner, or as a team member). For these 10 items, the initial segment (16) of a long movement construction was thus locally ambiguous: the left peripheral accusative wh-phrase could have also been a matrix object.

(16) *wen hat er wem versprochen* [...]
 who.acc has he who.dat promised

In contrast, none of the 16 verbs in EXP. 1 that are constructed with an infinitive and an accusative object (*informieren* ‘to inform’, *zwingen* ‘force’, *überzeugen* ‘convince’, etc.) can be constructed with a dative argument. The initial segments like (17) never involved a local ambiguity. In line with Fanselow & Frisch (2006), this difference between (16) and (17) in terms of local ambiguities may be made responsible for the small difference in acceptability.

(17) *wem hat er wen informiert* [...]
 who.dat has he who.acc informed

- Experiment 2

If the decreased acceptability of the crossing movement items in EXP. 1 is caused by the increase in size of the movement path rather than the crossing nature of the movement, one should be able to observe this low acceptability of sentences in which a wh-phrase left a complement infinitive independent of the nature of the DPs crossed by that movement. In contrast, if the main effect of EXP. 1 is a true superiority effect, sentences in which the wh-phrase from the control infinitive crossed a matrix wh-object should be less acceptable than sentences in which this is not the case. At least, this should hold if violations of grammatical principles have a cumulative effect on acceptability, as was made plausible by Keller (2000).

In EXPERIMENT 2, we eliminated the short (= CROSS-) movement conditions from EXP. 1 (=15a,c), in order to keep the design of the experiment manageable. The two long (= CROSS+) movement multiple question conditions (15b,d) were retained, and we constructed out of them two new conditions (\pm WH-PRONOUN) by replacing the *in situ* wh-phrase with a corresponding personal pronoun in the – WH-PRONOUN items. The two factors CASE (taken over from EXP. 1) and \pm WH-PRONOUN thus yield a design of stimuli exemplified in (18).

(18) a. *Wen hat er wem geholfen, über den Tod der*
 Who.acc has he who.dat helped about the death the.gen

Angehörigen zu informieren
 relatives to informieren ACC +WH
 “who has he helped to inform who about the death of the relatives?”

- b. *Wem hat er ihm geholfen, über den Tod der*
Who.acc has he him.dat helped about the death the.gen

Angehörigen zu informieren ACC -WH
relatives to inform
“who has he helped him to inform about the death of the relatives?”

- c. *Wem hat er wen informiert, wegen dem Tod der*
Who.dat has he who.acc informed because the death the.gen

Angehörigen zu helfen? DAT +WH
relatives to help?
“who has he informed that he helped who because of the death of the relatives?”

- d. *Wem hat er ihn informiert, wegen dem Tod der*
Who.dat has he him.acc informed because the death the.gen

Angehörigen zu helfen? DAT - WH
relatives to help?
“who has he informed him that he helped because of the death of the relatives?”

The idea behind this manipulation was that it enables us to keep apart the long movement and the crossing effect by comparing (18a,c) with (18b,d). As in EXP. 1, 4 items per condition were rated by 32 persons (students of the University of Potsdam), who also saw 72 unrelated distractor items on a questionnaire. The results of EXP. 2 are given in Table 2

	DAT	ACC
+WH PRONOUN crossed	2.04 (18c)	2.74 (18a)
- WH PRONOUN crossed	1.91 (18d)	2.61 (18b)

Table 2: Mean acceptability in EXP. 2

In line with the results of EXP. 1, overall acceptability was comparatively low in EXP. 2. This is not surprising, since all experimental items in EXP. 2 were identical with or constructed from the two relatively unacceptable conditions of EXP. 1. The experimental items used in both experiments received roughly the same mean ratings in both studies (2.74 vs. 2.38 and 2.04 vs. 1.87), but absolute values tell us

very little in acceptability rating experiments. The acceptability difference between accusative and dative initial questions that was visible as an interaction in EXP. 1 reappeared as a main effect in EXP. 2 ($F_1(1,31)=14,05$; $p = .001$; $F_2(1,15)=24.77$; $p < .01$), and needs no interpretation beyond the one offered above. There was no effect of the \pm WH-PRONOUN factor: it did not matter whether the phrase crossed by wh-movement was a further wh-phrase or a personal pronoun (2.39 vs. 2.24, $F_1 \& F_2 < 1$). The two factors also did not interact with each other.

That it did not matter for acceptability whether the wh-phrase was moved across a pronoun or a further wh-phrase suggests that there is no ban against crossing wh-movement in German. In other words, the contrast that we observed in EXP. 1 between the crossing and non-crossing conditions was entirely due to the length of the movement path. When we keep the length of the movement path constant, and have items differ in terms of the crossing factor alone, no acceptability difference appears. Crossing movement as such does not seem to be ruled out in German.

Of course, one always needs to be careful in not reading too much into the absence of an effect. Although the effect of grammatical violations on acceptability is cumulative (see Keller 2000), one might argue that the absence of an additional impact of a crossing violation is due to a floor effect. This cannot be excluded for the DATIVE condition, but if the results for the dative condition represent the “floor”, the mean acceptability of the ACCUSATIVE items is situated well above this floor, so that an additional superiority effect should be visible at least in the ACCUSATIVE condition, which it is not.

A potential problem for our interpretation of EXP. 2 (and EXP. 1) stems from the ambiguity of German wh-pronouns. When they are accented, they are interpreted as question quantifiers, but when they are unaccented, they serve as indefinite pronouns, as in (19).

- (19) *Du solltest wen fragen*
 you should indef. ask
 “you should ask someone”

Since our experiments used a written questionnaire, we of course do not know whether the participants had interpreted the wh-pronouns with their accented question interpretation (then EXP. 2 tells us much about superiority effects), or their unaccented indefinite interpretation (then EXP. 2 would have been uninformative).

There are reasons to doubt that the results of EXP. 1 and EXP. 2 can be explained away along these lines. First, we carried out two parallel experiments (to be reported elsewhere) involving multiple questions with clausemate wh-phrases with material presented acoustically and in written form, and found no difference whatsoever between the two presentation modes: apparently, participants do in-

interpret a second *in situ* occurrence of a wh-pronoun as a question operation. Second, a production study was performed with the items of EXP. 2 with 6 native speakers of German who read them out from a computer screen in a random order. Thus, 16 pairs of sentences were tested, which came in two variants, one variant with a wh-word, one with a pronoun. 60 fillers were inserted between the target sentences. Nearly all wh-pronouns were accented (89 out of 96 realizations), but only 7 of the pronouns were realized as accented. This result further corroborates the view that native speakers of German preferentially interpret an *in situ* occurrence of a wh-pronoun in a multiple question as a question operator (rather than as an indefinite) when the items are presented in written form.

In order to be on the safe side, we also repeated a modified version of Exp.2 with acoustic rather than written presentation.

- Experiment 3

In order to keep EXPERIMENT 3 manageable, we eliminated the DATIVE initial conditions from EXP. 2 but added a factor “ACCENTUATION” to the design. All items thus began with the accusative wh-pronoun *wen* moved out of an extraposed control infinitive. The sentences were reduced in size in comparison to EXP. 1 and EXP. 2. The reason for this reduction was to keep the string of deaccented words after the main accent on *wem* or on *ihm* in (20b) and (20d) as short as possible. In the wh-intervening condition (20a-b), *wen* crossed a dative matrix wh-pronoun, in the pronoun intervening condition (20c-d), *wen* crossed a dative personal pronoun. The crucial element could be deaccented (20a,c:smaller font) or accented (20b,d; capitalization). Except for the additional accent on the second wh-pronoun or on the pronoun, the overall accent pattern of the sentences did not differ in the two conditions. In both cases, the remaining segment of the sentence was deaccented.

- (20) a. *wen hat er wem geholfen über einen Todesfall zu informieren*
 who.acc has he who.dat helped about a death to inform
 “who has he helped someone to inform about a death?” +WH -ACCENTED
- b. *wen hat er WEM geholfen über einen Todesfall zu informieren*
 “who has he helped to inform WHO about a death?” +WH +ACCENTED
- c. *wen hat er ihm geholfen über einen Todesfall zu informieren*
 who.acc has he him.dat helped about a death to inform
 “who has he helped him to inform about a death?” -WH -ACCENTED
- d. *wen hat er IHM geholfen über einen Todesfall zu informieren*
 “who has he helped HIM to inform about a death?” -WH +ACCENTED

If the grammar of German contains a specific ban against wh-movement crossing a wh-question operator, it should specifically affect the acceptability of the +WH +ACCENTED condition exemplified in (20b).

The 16 experimental items (4 per condition) were presented to 36 participating students of the University of Potsdam and the Humboldt University Berlin embedded in a larger audio experiment with two parts; the total number of stimuli in the relevant second part was 60. The participants listened to the experimental items (which they also saw in written form on a computer screen) and rated them on the 7-point scale used in the previous experiments. The mean acceptability of the four conditions is given in Table 3.

	+ ACCENTED	- ACCENTED
+ WH-PHRASE CROSSED	3.08 (20b)	3.01 (20a)
- WH-PHRASE CROSSED	2.63 (20d)	3.33 (20c)

Table 3: Mean acceptability in EXP.3

There was a main effect of the factor \pm ACCENTED, which failed to reach the level of significance in the item analysis ($F_1(1, 35)=5.69$, $p=0.02$; $F_2(1, 15)=4.15$, $p=0.06$). There was no effect of the type of the crossed phrase ($F_1, F_2 < 1$). The interaction between the two factors was significant ($F_1(1,35)=8.34$, $p=0.01$; $F_2(1,15) = 6.969$, $p=0.02$). A comparison of the two conditions involving a crossed wh-phrase yielded no significant difference ($F_1, F_2 < 1$).

The results of EXP. 3 are in line with the previous two experiments. Whether a wh-pronoun that is crossed over by another wh-phrase is accented or not makes no difference for the acceptability of the sentence. True question wh-pronouns can be crossed over as easily as indefinite wh-pronouns, which strongly supports the view that German has no superiority-like effects even for the movement out of control infinitives.

Sentences with accented personal pronouns were less acceptable than those with unaccented ones. Probably, this is due to the fact that the (exceptional) accentuation of a pronoun implies its contrastive use, which –given the sentences were presented in isolation– was not motivated for the experimental items. The issue is unimportant for our present discussion, however.

From EXPS. 1-3, we draw the conclusion that wh-phrases originating in a control infinitive can cross matrix wh-phrases when they are A-bar-moved to the matrix Spec,CP. This poses a problem for any theory that tries to explain the absence of superiority effects in German in terms of scrambling. E.g., Müller (2004) acknowledges the judgments concerning (14b), and suggests that the crossing movement is licensed because the wh-phrase can be scrambled out of the control infinitive. While it is certainly true that some infinitival complements are trans-

parent for scrambling, this does not hold in general (see, e.g., Bayer, Schmid & Bader 2005 for an overview and some experimental data). In particular, XPs may be scrambled out of (non-extraposed) infinitives that correspond to direct objects, but if the matrix verb accepts both an accusative DP and an infinitive CP at the same time, the CP is normally a barrier for scrambling. This is exemplified in (21): the dative object *der Maria* of the infinitive cannot be placed into the matrix clause.

- (21) a. *Ich habe den Peter informiert der Maria geholfen zu haben*
 I have the.acc Peter informed the.dat Mary helped to have
 “I have informed Peter about having helped Mary”
- b. *?*Ich habe den Peter der Maria informiert geholfen zu haben*
- c. *?*Ich habe der Maria den Peter informiert geholfen zu haben*

Verbs governing additional accusative DPs and disallowing scrambling out of their infinitival complement were used in half of the experimental items of EXP. 1 and EXP. 2. In spite of the fact that their complements are islands for long scrambling, we could find no specific superiority effect with those verbs either. This makes it implausible that scrambling is the factor responsible for the wellformedness of superiority violations in German.

The same difficulty arises when one considers the Scandinavian languages. They have no scrambling operation, but the much more restricted operation of Object Shift (moving objects to the left in verb movement contexts) is sometimes applicable, which Müller (2004) claims is also responsible for the absence of superiority effects. In contrast to scrambling, Object Shift is always a clause-bound operation, so we would expect that violations of superiority are tolerable for clausemates only in Swedish and Icelandic if Object Shift is crucial for the grammaticality of crossing movement. This expectation is not borne out, though: two of our five Swedish informants accepted the b-examples in (22) and (23) (and two rejected them, while one informant found them questionable).

- (22) a. *Vem boerjade att laesa vad*
 who began Comp read what
 “who began to read what?”
- b. *Vad boerjade vem att laesa*
- (23) a. *Vem lovade att laesa vad*
 who promised Comp read what
 “who promised to reach what?”
- b. *Vad lovade vem att laesa*

Likewise, both (24a) and (24b) are acceptable to (some) speakers of Icelandic.

- (24) a. *Hver taldi Mariu á að kaupa hvað?*
 who told Mary Comp buy what
 “who told Mary to buy what?”
- b. *Hvað taldi hver Mariu á að kaupa?*

While the results of EXP.2 - 3, and our Swedish and Icelandic data resist an interpretation in terms of scrambling/Object Shift preceding *wh*-movement, they can be made compatible with the spirit of Müller’s approach. German, Icelandic, and Swedish are verb second languages, and that this property may play a role for licensing crossing movement was already proposed by Noonan (1988). Verb second languages generally allow the movement of complement clause material into the matrix Spec,CP position. In particular, it seems as if XPs with a ‘contrastive’ interpretation can undergo such a movement (Frey 2005).

If a contrastive phrase merged in a complement clause targets the matrix Spec,CP position, it will have undergone intermediate movement to the specifier position of the complement clause. In other words, in V/2 languages *wh*-phrases do not only reach escape positions in the context of scrambling, but also in the context of (intermediate) A-bar-movement to Spec,CP on the basis of their contrastive status (or on the basis of whatever is responsible for the fronting of complement clause material to the 1st position in V/2 matrix clauses). Such movement steps unrelated to the +*wh* feature are responsible for the circumvention of PB effects. Suppose that a *wh*-phrase β has reached this lower Spec,CP position on the basis of the movement of contrastive phrases in (25). Since it has reached the specifier position of the CP phase, β is as accessible for further movement to the escape hatch α of the higher phase *vP* as the subject and the object of the matrix clause are⁴. Therefore, β can cross matrix clause elements in a *wh*-movement step reaching Spec,CP.

- (25) [_{CP} ... [_{VP} α [_{VP} subject [_{VP} V object [_{CP} β ]]]]]]

Scrambling and topicalization are thus means to circumvent PIC/PB effects that would otherwise force non-crossing *wh*-movement. Our extension of Müller (2004) shares with Bošković (1997) the idea that non-crossing movement arises because of the availability of a further A-bar-movement operation.

Since the crossing and non-crossing movement differ as to which *wh*-phrase ends up in Spec,CP, they yield different interpretations in terms of the ‘sorting

⁴ One can even assume that the feature licensing (contrastive) topicalization may even place the lower *wh*-phrase into the specifiers of the matrix VP and the matrix *vP* in the PB approach of Müller (2004).

key' for the answers to multiple questions (Comorovski 1996). An intermediate movement step licensing crossing movement thus has an effect on the semantic output, and might be licensed accordingly. It is thus also licensed in models that link the grammaticality of intermediate movement to output effects.

3. Extractions from Finite Complements

The modification of Müller's (2004) model we propose here makes the prediction that there should not be superiority effects for the movement of *wh*-phrases from complement clauses, either. For Swedish, we observe again that 2 of our 5 informants find (26b) acceptable:

- (26) a. *Vem tror att Johan gjorde vad*
 who believes that Johan did what
 "who believes that Johan did what?"
- b. *Vad tror vem att Johan gjorde*

Haider (1997:221) exemplifies the claim that even *wh*-phrases from finite complement clauses may cross matrix *wh*-phrases in German with examples such as (27). Such sentences involve apparent movement from V2-complement clauses, and the theoretical status of such an operation is quite unclear, see Reis (1996, 1997) for the claim that the construction is parenthetical⁵ and does not involve long movement. Because of this alternative analysis, it is difficult to find an unambiguous interpretation for the acceptability of (27).

- (27) *wem_i hat wer gesagt [e_i habe sie e_i ein Bild verkauft]?*
 who.dat hat who.nom said has.subj. she a picture sold
 "who said she had sold a picture to whom?"

As for the theoretically more transparent (28), the literature on German has so far assumed that such constructions are ungrammatical (Frey 1993, Buring & Hartmann 1994, Heck & Müller 2000, Müller 2004), and that this is so because of the superiority violation.

- (28) *#wen hat wer geglaubt dass der Fritz mag*
 who.acc has who.nom believed that the.nom Fritz likes
 "who has believed that Fritz likes who?"

However, Fanselow (2004) raised some doubts as to whether the status of (28) is in fact linked to a superiority-like effect. First, the example involves the crossing

⁵ Note, however, that the occurrence of the *in situ* *wh*-quantifier in (27) itself constitutes an argument against a parenthetical interpretation of the segment *hat wer gesagt*.

of an animate wh-subject by an animate wh-object, which reduces the acceptability of crossing movement even in German (see, e.g., Featherston 2004). Examples such as (29) avoiding this difficulty sound much better.

- (29) *was hat er wem gesagt dass er mitbringen muss*
 what has he who said that he bring must
 “who did he tell that he should bring what”

Furthermore, the acceptability of examples such as (28) and (29) does not change when the wh-pronouns are replaced by *which*-phrases, although that should be the case if a superiority effect is indeed involved. Finally, (28) – (29) involve long movement from a *finite* that-clause, and we know since Kvam (1983) that this is a questionable construction for many or most dialects of German.

In a crosslinguistic internet-based survey about multiple questions (ling.uni-potsdam.de/fogra3/neu) we asked the participants to rate (30a) and (30b), among 36 further multiple questions (in German and a number of further languages).

- (30) a. *was hat wer gesagt dass Maria gekauft hat*
 what has who said that Mary bought has
 “who said that Mary bought what?”
- b. *was hat Peter gesagt dass wer gekauft hat*
 what has Peter said that who bought has
 “who said Peter _ bought what”

(30) represents a nearly ideal minimal pair, since both sentences involve the long movement of *was* “what” and the crossing of a subject wh-pronoun, the only difference being that the superiority violation involves clausemates in (30b) but not in (30a). Of the 24 German native speakers that participated, 20 rejected *both* examples, which highlights again the serious problems most Germans have with long wh-movement. Of the remaining 4 informants, 2 accepted both sentences, and 2 rejected only (30a).

The empirical evidence concerning (30a) is thus ambiguous, though the judgments of two of the informants and the one in Fanselow (2004) at least show that crossing movement is not ruled out categorically in this case. Note that (30a) differs from (30b) in that long movement is unavoidable in (30b) but could be circumvented by preposing *wer* in (30a). Clifton, Fanselow & Frazier (2006) show that the absence of a meaning-identical competing structure that incurs less violations of grammatical constraints than some target structure may increase the acceptability of that target structure. This could be responsible for the fact that more people find (30b) acceptable than (30a).

Together with the evidence coming from Exp.2 and the Scandinavian data presented above, we take it that the status of (30a) also offers little reason for assuming a particular ban against crossing movement in German.

4. Concluding Remarks

Many models trying to explain the grammaticality of (superficially) crossing wh-movement in German and similar languages share the assumption that German possesses a movement process that English lacks and that allows to introduce an additional intermediate movement step into the derivation that makes it possible for the lower wh-phrase to pass the higher one. The empirical evidence presented in this paper implies that there are at least some cases where this additional movement step cannot be scrambling. Rather, (contrastive) topicalization seems to play a role in the verb second languages as well; this insight brings the analysis of Germanic languages closer to what was proposed for the Slavic languages by Boškovič (1997).

A number of problems remains of course. First, one would want the status of (30a) to be fully clarified. Second, our proposal implies that verb-second languages should have no superiority effects at all. While some speakers of Dutch accept crossing movement for clausemate wh-phrases (Fanselow 2004), many others do not. Such a pattern is not expected in a verb second language. Finally, the acceptability of crossing movement of clausemate wh-phrases goes down in German and Slavic languages (see Meyer 2004, Featherston 2004) when two animate wh-phrases interact, and it is unclear why this effect does not show up in our data. Probably, the animacy effect observed by Meyer and by Featherston crucially involves the subject status of the *in situ* wh-phrase, but what it could be triggered by is fairly unclear.

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