

The superiority conspiracy: four constraints and a processing effect

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Abstract: English wh-in-situ restrictions are commonly analyzed in terms of locality and minimality type constraints, in minimalist theories as well as in optimality oriented approaches. The ‘Minimal Link Condition’ (MLC) is a present day rendering of Chomsky’s (1973) original concept of ‘superiority’.² The wh-item closest to the top spec-position (‘spec C’) receives priority for movement to this position. A comparative look at Germanic languages, however, tells us that the wh-in-situ patterns do not follow a simple concept of locality or distance-based economy. From a cross-linguistic vantage point, English ‘superiority’ will be argued to be epiphenomenal of independently motivated grammar constraints, plus a processing restriction.

The main claim of this contribution is as follows: MLC is inadequate for capturing the core patterns of wh-in-situ. The crosslinguistic distribution patterns of wh-in-situ are determined by at least four *independent* grammatical factors: i) obligatory *operator status* of a wh-item in situ in spec-positions; ii) *semantic* type (individual level vs. higher type) of the licensing wh-element; iii) *domain* requirement for semantic integration of an adverbial wh-item; iv) strictly binary licensing relation for an in-situ wh-element. The residue of superiority-like cases not covered by these constraints seems to invite an account in terms of a processing restriction, rather than a structural constraint.

1. Revisiting wh-in-situ

In Haider (2000), the common and the contrasting properties of German and English wh-in-situ constructions were derived as effects of semantic *type* and *domain* conditions (for adverbial wh-items) on the one hand and the different structural positions of the subject wh-elements on the other, plus a minimality condition relativised to the level of case features. This analysis is not fully adequate however. First, it remains silent on some intricate empirical issues (see examples 1 and 2), second, it does not satisfactorily capture the facts of Icelandic - as the crucial testing ground for OV/VO-based accounts of crosslinguistic contrasts -, and third, as it seems, it elevated a processing restriction to the level of a grammatical constraint (see the discussion of the examples 3).

Before going into details, let me enumerate the problem areas for the standard locality approach to superiority phenomena that will be discussed in this paper by assigning them to the constraints that will be shown to be responsible for these phenomena in the rest of the paper.

- i) *obligatory operator constraint*: The acceptability of an in-situ wh-element in a functional spec-position depends on its ability to function as an operator that binds a variable. This is not the case for an in-situ wh-item in its VP-internal argument position [see the ‘amnesty’ phenomenon illustrated by examples (1)].

- ii) *semantic type constraint*: licensor and licensee must *not* both be operators ranging over 'higher-than-individual' semantic types [see examples (2)].
- iii) *Domain-mapping constraint* (for semantic integration of adjuncts): *Operators* need to c-command their (semantic) domain. For higher order types (e.g. *why*, *how*), their domain of semantic integration is the domain of eventualities, whose structural counterpart is the tense domain.
- iv) *minimal binding constraint*: the licensing relation between a dependent, in-situ wh-element and its licensing wh-element is biunique: The dependent wh-element is licensed by a minimally c-commanding licensed wh-item.

As for the '*amnesty*' effect, a satisfactory account of wh-in-situ construction should provide insight into constructions in which a wh-violation is partially legalized by a binding relation (see Hornstein 1995:144). This is the case if the illegal wh-in-situ element binds a variable (1b) or if the illegal wh-element c-commands (and locally licenses) another licit wh-element (1c). Why should 'superiority violations' become much less severe if the 'illegal' in-situ wh-element is followed by a 'legal' one, or if it binds a pronominal variable? The answer will be: an in-situ wh-element whose argument position is a spec-position is an *obligatory operator*, whose operator function must be satisfied (by having it bind a variable). The obligatory operator status of a subject wh-element is a crucial and independent factor for ruling out dependent in-situ wh-subjects in English.

- (1) a. * *I'd like to know where who hid it*
 b.(?) *I'd like to know where whoⁱ hid hisⁱ papers* (see Hornstein 1995:144)
 c.(?) *I'd like to know where who hid it when* (Chomsky 1981: 238, Kayne 1983: 235)

Second, a hitherto unnoticed restriction on the licensing relation for the in-situ wh-element can be easily identified in OV languages like German and Dutch. Both languages seem at first sight to defy a universal restriction - adverbial wh-operators like *why* and *how* cannot license each other - in the context of wh-in-situ constructions with more than two wh-items. But on closer inspection, this apparent violation provides a more precise insight into a biuniqueness property of the licensing relation between an in-situ wh-item and the wh-element it depends on.

The fact that *why* and *how* cannot license each other (see 2a for English) seems to hold universally. But German and Dutch appear to allow exceptions (2b,c) in cases of *intervening*, properly licensed in-situ wh-element (see the contrast in 2b for German and 2c for Dutch). Upon closer inspection, it will turn out, however, that there are not exceptional at all. Note, first, that this case is different from the 'amnesty' case in (1). In the former case, the illicit wh-element needs to c-command a licit in-situ one. In (2), however, the illicit wh-item is c-commanded by a licit in-situ wh-item. The licit in-situ wh-element must precede (see 2e) the wh-adverbial. What this tells us is that the licensing relations are binary and that the in-situ element is not licensed by the moved wh-item.³

- (2) a. *Why did he organize it how? - *How did he organize it why?
 b. Warum hat man was/*das **wie** organisiert?
 why has one hat/that how organized
 c. Wie hat man was/*das **warum** organisiert?⁴
 how has one what/*that why organized
 d. Waarom heeft men wat/*dat **hoe** geregeld?
 why has one what/thathow organized
 e. *Wie hat man warum was organisiert?
 how has one why what organized

Finally, the superiority characteristics of *long distance extractions* need to be considered. The examples (3a,c) appear to be clear cases of a minimality effect: Moving the lower wh-item across a wh-item in the matrix clause requires long distance movement whereas moving the other potential candidate would amount to local overt movement in the matrix clause only. Is this indeed the source of the unacceptability? The answer is most likely yes, but at least in the case of (3b,c), the unacceptability seems to be not the reflex of a grammaticality violation (i.e. violation of a minimal link condition) but rather a reflex of processing clashes, as shall be argued below.

In Haider (2000), the patterns illustrated in (3b,c), originally discussed in Fanselow (1991: 330) and Müller (1995: 323), are accommodated in terms of a minimality requirement. The acceptability of (3b), however, would require relativizing the range of minimality-relevant features to the lexical level of an *animacy feature*, since *was*_{3rd sg./n.} and *wen*_{3rd sg./m.} differ only with respect to animacy, but not in person, number, or case. A more adequate account of the contrast between (3b) and (3c) and similar contrasts to be discussed later in the paper is one in terms of a processing restriction: in structure processing (i.e. parsing), antecedent-gap resolution crashes if a non-distinct element (belonging to another chain) interferes in the computation of an antecedent-gap path. This is the case if a potential source position of a moved item contains a non-distinct element that depends on the head of the chain.

English is a crucial case since the superiority effect is not restricted - as in German - to occurrences of non-distinct wh-items type but seems to hold for DP-type wh-elements in general:

- (3) a. *What_i/*who(m)_i did you ask who(m) [to fix e_i]
 b. Was_i hast du wen gebeten [dir e_i zu zeigen] ?
 what did you who ask [you_{Dat} to show]
 c. *Wen_i hast du wen gebeten [dir e_i zu zeigen] ?
 who did you who ask [you_{Dat} to show] - 'Who did you ask who to show to you'

If the examples (3a) and (4a,b) are representative,⁵ then they indicate that in English, the intervention effect is not triggered by the *morphological* non-distinctness of wh-elements, although it differentiates between *categorially* different items (see 4c,d).

- (4) a. **Who(m)_i did you give what [to e_i]?* (Fiengo 1980:123 ex. 16a)
 b. **Who(m)_i did you introduce who(m) [to e_i]*
 c. *[For whom]_i did you build what e_i ?* (Fiengo 1980:123 ex. 17b)
 d. *[To whom]_i did you introduce who(m) e_i ?*

It seems, however, that at least Fiengo's judgment for the pattern (4a) is not generally shared, given Culicover's (1997:220, ex. 2b) characterization of (4a) as regular and not deviant at all.

2. Observational inadequacies and shortcomings of minimality-based accounts

Contrary to widely held beliefs, concepts of minimality or locality are neither empirically nor descriptively fully adequate. The empirical coverage is poor in a cross-linguistic perspective, and even for English there are some problematic cases:

- (5) a. *Whom_i did you promise [to timely phone up e_i] when/where ?*
 b. *When/where_i did you promise [to timely phone up whom] e_i ?*
 c. *Whom_i did you confess [to have tried [to timely phone up e_i]]] when/where ?*

In a strictly minimal link-driven derivation, either (5a) or (5b) ought to violate a minimality requirement for the matrix construal of the adverbials, given that in s-structure, one of the two wh-elements is obviously more deeply embedded than the other. In terms of a minimal-link condition (Chomsky 1995: 295,311), the matrix adjunct wh-element in (5b) is necessarily closer to the spec-position of the root than the wh-element in the embedded clause. Since infinitival embeddings can be iterated, there is no principled limit for the depth of embedding (5c).

In a cross-linguistic perspective, contrasts like those between English and German, call for a principled explanation. In German, a subject wh-expression may stay in situ, so the well-known English subject-object asymmetry for non-'d-linked' (Pesetsky 1987) wh-pronouns is not found (Haider 1984). The German examples (d-f) correspond to the English examples (a-c), but the German ones are all fully acceptable and attested.⁶

- (6) a. *Who saw what ?* d. *Wer hat was gesehen?*
 b. **What did who see?* e. *Was hat wer gesehen?*
 c. **When did who see it?* f. *Wann hat es wer gesehen?*

In fact, data⁷ that show the irrelevance of a minimal link condition in accounting for the subject-in-situ cases are noted and discussed already in Chomsky's Pisa lectures (1981: 236f.). The relevant contrasts are illustrated in (7). A wh-subject is ungrammatical in situ, independent of superiority contexts:

- (7) a. *It is unclear who thinks (that) we saw whom*
 b. **It is unclear who thinks (that) **who** saw us*
 c. *I don't know who would be happy if he/***who** won the prize* (Chomsky 1981: 236)

Whatever principle accounts for the ungrammaticality of *wh*-in-situ in (7b,c) will account for the ungrammaticality of (6b,c). (7b,c) are unaccounted for under superiority, and under current accounts in terms of shortest move (or MLC), as well, simply because they do not involve a competition between a shorter and a less short move.

In the following sections I shall review the contexts and conditions that in sum produce an apparent 'superiority conspiracy' for English. Cross-linguistic comparisons will show that the superiority conspiracy is the combined result of several, independent factors, some of which are structural and some of which are interface effects (at the syntax semantics interface).

Let me add a final critical remark on methodology: Not only the minimalist approach is too narrowly tailored to English. Other approaches to multiple *wh*-constructions, as for instance Erteschik-Shir (1997, sect. 6.2) 'focus structure'-based one, suffer from the same defect, namely too small (and therefore not sufficiently representative) a database. Her constraint (*subject constraint*; Erteschik-Shir 1997: 191-193) would incorrectly rule out *wh*-in-situ subjects in German, Dutch and other OV languages on a par with English. But, her approach can be saved, if the notion of 'SUBJECT' in Erteschik-Shir's subject constraint is construed not as 'argument licensed under agreement with the finite verb' but as 'argument licensed in the spec of a functional projection of agreement with the finite verb'. In this case, her *subject constraint* and the *obligatory operator constraint* produce the same outcome.

3. Wellformedness conditions for *wh*-in-situ

3.1. The obligatory operator status of *wh*-elements in spec

As illustrated above (see 7), the grammatical source of the deviance of dependent *wh*-subjects in English is independent of superiority contexts and it is a VO-type phenomenon. It will be argued that the deviance is triggered by the structural configuration of the subject position in a VO language as a functional spec position. In German (and in other OV languages), the subject remains in its VP-internal subject position (see section 5), whence the contrast with English in the *wh*-in-situ contexts.

An in-situ *wh*-element gains *obligatory operator status* by virtue of being in a functional spec-position whose head checks an argument feature of this *wh*-element (to be elaborated in section 3.2.1). This is the basis of the account for the ungrammatical sentences in (7): a *wh*-subject in-situ that does not bind a variable is a vacuous operator and therefore ungrammatical. If the variable binding requirement is met, however, the ungrammaticality status changes. This is the source of the amnesty phenomena mentioned in the introductory section. For the sake of convenience, I repeat the examples:

- (8) a.(?) *I'd like to know where whoⁱ hid hisⁱ papers*
 b.(?) *I'd like to know where who hid it when*

In (8a), the *wh*-subject binds a pronominal variable; in (8b), it binds a *wh*-variable and thereby satisfies the operator requirement.⁸ It will be demonstrated in the next section that in

(8b), *who* is indeed the licenser for *when*. A wh-element in situ is licensed in a strictly minimal environment, that is, in the minimal c-command domain of a potential licenser. This will be made clear in the discussion of German data in the following section.

German provides independent evidence for the obligatory operator status of a wh-element in a functional spec-position since in-situ wh-elements can be either interpreted as indefinite pronouns or wh-expression:

- (9) a. *Wie oft hat wer angerufen ?* (ambiguous)
 how often has who phoned-up
 ‘How often did someone call?’ - ‘Who called how often?’
 b. *Wer hat oft angerufen *(?)*
 Who has often called?
 ‘Who has called often’ vs. *‘Someone has often called’

If the wh-pronoun is moved to spec-C, it cannot be interpreted as an indefinite pronoun. By virtue of being in the spec-C position, it is bound to function as an operator. Let us call this the *obligatory operator constraint* of the superiority conspiracy: Fully licensed (see below) wh-elements in a functional spec-position are operators. Therefore, variable binding may satisfy their operator status. Note that the VP-internal trace of the subject (in ‘spec-VP’) in English does not qualify as a variable because the subject is not fully licensed as an argument in the VP-internal position.

3.1.1. Remarks on ECM and subjunctive subjects, and on the vacuous movement thesis

The particular reference to checking in the first paragraph of the preceding section is motivated by the difference between a nominative subject on the one hand and an exceptionally case-marked subject (examples 10a,b from Chomsky 1981: 236) or the subject of an English ‘subjunctive’ construction⁹ (Bresnan 1977) on the other hand. These subjects (10a,c) are not subject to the *obligatory operator constraint*:

- (10) a. *Who believes [whom to have read the book]*
 b. **Who believes (that) [who has read the book]*
 c. *Who recommend that [who be fired]*

For (10a) the standard ECM-account is sufficient for handling it: If the governing verb is the source/licenser of case of the ECM-subject, the ECM-subject is not checked by a functional head. A similar consideration applies to (10c). In the subjunctive construction, agreement is suspended. So agr-S does not check the subject, hence the in-situ-position is not checked by the functional head.¹⁰ Let me add that this is of course but a descriptive characterization of the respective contexts in which the obligatory operator effect is operative.

My final remark concerns clause initial wh-subjects and the *vacuous movement hypothesis*: Note that the *operator constraint* is not a variance with the assumption that a clause initial subject wh-element stays in its functional subject position in English and is not string-vacuously moved to Spec-C. The reason is that wh-element are licensed in one of two set-

tings, namely directly or dependently. Direct licensing applies in Spec-C. In the main clause, the wh-feature is checked by clausal typing, in dependent wh-clauses, the wh-feature is checked by subcategorization. The operator constraint is trivially fulfilled if a wh-element is construed as the clausal typing wh-element, that is, the wh-element in the highest functional position available. In this case, the wh-element is construed as the wh-operator of the clause. So, a wh-subject may remain in its subject position (if there is no higher overt functional projection targeted by another wh-phrase) without violating the obligatory operator constraint. Only in case the wh-subject is a dependent wh-element (with another wh-element in Spec-C) the obligatory operator constraint applies, and it becomes responsible for a secondary effect: The operator property must be fulfilled, but the wh-element cannot be the wh-operator of the clause (since this function is assigned to the wh-element in spec-C). So, a secondary, wh-unspecific operator function becomes crucial, namely operator-variable binding function.

3.2. Semantic type restrictions on in-situ licensing

3.2.1 Why and how as higher type operators

Why and *how* differ from other adverbials like temporal or local ones with respect to the semantic type of the phrase they are applied to. Argumental, temporal or local wh-elements are operators that range over individual type variables. *Bare reasons* and *manner* adverbs range over higher order types, namely properties of eventualities. This has been noted frequently (Aoun & Li 1993:153; Szabolcsi & Zwarts 1993, Hornstein 1995, Reinhart 1998).¹¹ Reinhart (1998:45) claimed on the evidence of patterns as (11a,b) and (12a,b) that the type property would disqualify *why* and *how* for in-situ usage in general. But German (12c,d), and corresponding data from Dutch (see 15), Yiddish¹² (Diesing 2001), Japanese (15b,c from Saito 1994:195), or Hungarian (Kiss 1993:191), to name just a few languages, show that the case of (11a,b) must be distinguished from the case (12a,b). In all these languages the pattern corresponding to (12) is fine,¹³ but (11) is out, and (11) is out on universal grounds.

- | | |
|---|---|
| (11) a. * <u>Why</u> did he fix it <u>how</u> ? | c. * <u>Weshalb</u> hat er es <u>wie</u> repariert? |
| b. * <u>How</u> did he fix it <u>why</u> ? | d. * <u>Wie</u> hat er es <u>weshalb</u> repariert? |
| (12) a. * <u>Who</u> fixed it <u>how</u> ? | c. <u>Wer</u> hat es <u>wie</u> repariert? |
| b. * <u>Who</u> fixed it <u>why</u> ? | d. <u>Wer</u> hat es <u>weshalb</u> repariert? |

The adequate descriptive generalization formulated in Haider (2000) is this: A wh-element denoting a wh-operator that does not quantify over individual terms does not license in-situ a wh-element that does not quantify over individual terms. The split *was-für* construction in German provides independent evidence for this generalization:¹⁴

In the split construction (13a),¹⁵ *was* - as the split off wh-element - does not quantify over individuals, but rather over higher order entities (namely kinds; cf. Beck 1996, Pafel 1996). So, (13a) is predicted to be ill-formed. The fact that (13c) is grammatical shows that the ungrammaticality of (13a) cannot be attributed to an *intervention effect* triggered by the in-situ

wh-item preceding the phrase with the extraction site. (13b) is the variant without splitting off the wh-element, that is, pied piping of the complete DP instead.

- (13) a. **Was_i hat er wie/warum [e_i für Autos] repariert ?*
 what has he how/why [for cars] repaired
 ‘What kind of cars did he repair why/how?’
 b. *[Was für Autos] hat er wie/warum repariert ?*
 [what for cars] has he how/why repaired
 c. *Was_i hat er denn wem/wann [e_i für Fragen] gestellt?*
 what has he PRT whom_{Dat}/when for questions put
 ‘What kind of questions did he ask whom/when’

The type restriction on higher type in-situ wh-expression is operative in all ‘how-x’ constructions (e.g. *how many*, *how expensive*, *how big*, ...), since these expressions all denote higher order predicates. The following German examples illustrate the expected restriction:

- (14) a. ?? *Warum hast Du wie große Kartoffel ausgewählt?*
 why have you how big potatoes chosen
 b. ?? *Wie große Kartoffel hast Du warum ausgewählt?*
 how big potatoes have you why chosen

In sum, this is the *second constraint* of the superiority conspiracy against wh-in-situ items, and it is a semantic type-restriction that becomes effective at the syntax semantics interface as a *semantic type constraint* for dependent wh-elements. The *semantic type constraint* forbids higher type wh-element to license each other. Therefore, a higher-type wh-element in situ is ill-formed if its licensing wh-element is also a higher-type wh-element. This constraint is likely to be cross-linguistically invariant, that is, there are no language specific variant factors that restrict its application. Note that this constraint is not a syntactic one, but one of semantic construction.¹⁶

3.2.2 VO/OV and a domain requirement for adverbials

A typological factor (namely VO vs. OV, or, head-initial vs. head-final) narrows the range of the third constraint of the superiority conspiracy so that it applies in VO but not in OV. It is a *domain mapping constraint*. Note that the semantic type constraint discussed above cannot be made responsible for the ban against higher order postverbal in-situ wh-elements in English (as in 12a,b above), because the corresponding patterns are grammatical in OV languages, as the German examples (12c,d) or the Dutch one (15a) or the Japanese examples (15b,c) illustrate. A higher order type wh-adjunct can be licensed in situ by a licit individual level type wh-operator.

- (15) a. *Wie heft het waarom/hoe gedaan?* Dutch
 who has it why/how done?
 ‘Who did it why/how?’
 b. *John-ga nani-o naze katta no* Japanese (Saito 1994: 195)
 John_{Nom} what_{Acc} why bought-Q ?

- c. *Dare-ga naze kita no*
 who-SUB why came Q-PRT
 ‘Who came why?’

The ungrammaticality of the pattern in (12a,b) in VO languages like English reflects an independent constraint: on higher order type wh-adverbials cannot be successfully licensed in postverbal positions. This is confirmed also by the German examples in (16), Yiddish (17), French (18a) and Portuguese (18b).

- (16) a. (?) *Er hat dagegen protestiert deshalb*
 he has it-against protested therefore
 b.* *Wogegen hat er protestiert weshalb?*
 what-against has he protested why
 c. *Wogegen hat er weshalb protestiert?*

In German, the extraposed position is not licit for the wh-variant (16b), although extraposition is possible to a certain extent with the declarative form (16a). Independent confirmation is abundantly available in Yiddish. Yiddish provides an excellent testing ground because arguments and adjuncts may occur either in post- or in preverbal positions. But, wh-adjuncts like ‘why’ and ‘how’ occur only in preverbal positions (17a), and not in postverbal ones (17b). Note, however, that the preverbal position in (17a) is the position that is not available in English.

- (17) a. *ver hot vi azoy/farvos ongeklungen der mamen* (Diesing 2001; ex. 8 and 9)
 who has how /why called the mother
 b. **ver hot ongeklungen der mamen vi azoy/farvos*
 who has called the mother how why

What the above examples illustrate is the effects of a domain condition for the semantic integration of adverbials: A wh-element denoting a wh-operator that ranges over higher order entities (e.g. predicates or propositions) needs to *c-command* (the head of) the phrase it is applied to as an operator [i.e. the (head of the) VP or its functional extension]. Assuming that c-command maps to precedence (cf. Haider 1992, Kayne 1994), postverbal positions are necessarily embedded positions. An adjunct wh-operator can only satisfy the domain mapping constraint in a position preceding the verb. But a VO clause structures does not leave room for such a position in between the subject and the VP either. This leads to ineffability, if a wh-subject and a higher order adjunct would have to co-occur.

Analogously, in French and in Portuguese, a reason wh-adjunct is not allowed in the postverbal position.

- (18) a. **Tu es venu pourquoi ?* (from Aoun 1986: 97)
 you have come why
 b. **O que fizeste porquê* (from Costa 2002,¹⁷ ex. 84a)
 what you-did why

The examples above illustrate the *third constraint* of the superiority conspiracy, the *domain mapping constraint*. In Haider (2000), it is identified as a domain condition for the semantic integration of adverbials: A wh-element denoting a wh-operator that ranges over higher order entities (e.g. predicates or propositions) must *c-command* (the head of) the phrase it is applied to as an operator (i.e. the (head of the) VP or its functional extension). Higher order adjuncts operate on events and propositions. Hence they are expected to c-command the element that situates the event variable. This element is the verb that carries the T-markings. Given that the postverbal positions are necessarily embedded position (cf. Haider 1992, Kayne 1994), c-command entails precedence.

But - and here the OV/VO factor becomes crucial - preverbal positions, that is, positions in the range between the functional subject position and the left edge of the VP, are highly restricted for independent reasons to the extent that phrasal adverbials cannot occur in these positions (see Haider 2000a) in VO languages in contrast to OV languages (see 19a,b).

A radical solution has been proposed by Rizzi (1990:47), who suggests that sentential adverbs are base-generated in spec CP on the evidence that *why* does not show a negative island effect (19c). But this fact simply shows that the base position of *why* cannot be in the scope of negation, as German clearly shows in (19d). *How*, however, cannot be base-generated above the negation, since it must be predicated on a domain that denotes an event, that is, a V-projection.¹⁸

- (19) a. **Who has when/why left?*
 b. *Wer ist wann/weshalb weggegangen?*
 c. *Why/*how didn't you come?*
 d. *Wer ist weshalb /*wie nicht gekommen?*
 who is why /how not come

3.2.3 Evidence for a strictly binary licensing function

The type constraint discussed in 3.2.1 provides insight into the licensing relation between the moved wh-item and the in-situ items in general. In principle, the licensing relation could be a one-to-many relation (like operator binding)¹⁹ or a strictly one-to-one relation. In the first case the moved element licenses all-in-situ elements in its domain as bound variables. In the second case, licensing is a strictly minimal and bi-unique relation. The moved element as the highest wh-element licenses only the highest in-situ wh-element which in turn licenses the next lower one, and so on. In this case, licensing would be a strictly binary function. The following data (20) provide the empirical basis for a decision between the two options. The bi-unique one is the empirically correct one.

If licensing were a one-to-many relation, a clause with a higher order type wh-element in the top spec-position ('spec C') is predicted to be deviant if one of the in-situ wh-elements is of a higher type too. This is a consequence of the *semantic type constraint* discussed in section 3.2.1 under the specified licensing conditions. If, however, licensing is a biunique relation, it

matters whether the two higher order wh-elements are in a direct licensing relation or in an indirect one. In the latter case, the constraint would not apply. The following data support a bi-unique licensing function:

- (20) a. Warum hat man was/*das **wie** organisiert ? (Ge.)
 why has one what/that how organized
 b. Waarom heft men wat/*dat **hoe** geregeld ? (Du.)
 why has one what/that how organized
 c. *Wie hat man **weshalb** was organisiert ? (Ge.)
 how has one why what organized
 d. Wie hat man was **weshalb** organisiert ? (Ge.)
 how has one what why organized

(20) illustrates two key facts. First, a clause with two higher-order wh-items is ungrammatical, unless an *additional wh-element* occurs, and second, the additional wh-element must c-commanded the second, higher order wh-element. In (20ab), the intervening object wh-element saves the otherwise ungrammatical clause. (20a,b) and (20cd) form a minimal pair with respect to the relative order of the in-situ wh-elements. In the acceptable patterns, the moved wh-element licenses the in-situ wh-object, which in turn is the licenser for the following in-situ wh-adjunct.

This strict biuniqueness restriction (the *minimal binding constraint*) on the licensing relation is *the fourth constraint* for in-situ wh-elements, referred to in the title of this paper. The next section addresses the discourse linking effect that has been hypothesized to account for the licensing of DP-internal wh-elements: it will be demonstrated that this effect can be explained as a subcase of the semantic type constraint.

3.3 D-linking - a dispensable condition ?

Pesetsky's (1987) *d-linking* hypothesis²⁰ is based on the contrast between a bare and a DP-internal wh-element in subject position (21a,b), and on the contrast between 'which' and 'how many' (21b, 22b):

- (21) a. **Mary asked what_i who read e_i* (Pesetsky 1987:104)
 b. *Mary asked which book_i [which men] read e_i ?*

Evidently, the wh-subject in (21b) does not violate the constraint violated by (21a). Pesetsky attributes this to a context relation. (21b) presupposes that there is a set of men, some of which read some books. This contrast had been noted before (e.g. Fiengo 1980, Guéron & May 1984) and construed as a structural effect, given that the wh-element in (21b) is embedded in a DP. Pesetsky takes examples as in (22) as evidence against a specifier-related source of the contrast in (21).

- (22) a. *I need to know how many people voted for whom*
 b. **I need to know whom_i how many people voted for e_i ?* (Pesetsky 1987:107)

According to Pesetsky, *how many* cannot be d-linked, and so it is subject to the same operator constraint as a bare *wh*-pronoun is. This assumption is not self-evident, however. If we replace ‘people’ by ‘men’ in (22), the discourse common ground for (21b) is identical with that of (22), with respect to the presupposed set of men. Nevertheless the two sentences differ in acceptability.

The essential difference seems to be one not in terms of d-linking but rather one in terms of the semantic type of the *wh*-operators. The *wh*-operator denoted by ‘which’ ranges over individual type variables, ‘how many’, however, does not range over individual type variables, but over cardinalities, that is, properties of sets. The ‘which’ operator binds the referential variable (‘role R’) of the NP and thereby satisfies its operator requirement for a *wh*-element in the spec (of DP). ‘How many’ is a higher type operator, so its binding requirements as an operator are not met DP-internally. Therefore it turns the DP into an operator phrase, and, since the DP is in a spec-position itself, it must have a variable to bind. In short, this type difference rather than ‘d-linking’ apparently is the crucial difference between (21) and (22).

German provides independent evidence for the type distinction. As expected, a phrase that denotes a higher type operator cannot license a higher type *wh*-phrase in situ. ‘How many’ (as in 23a) is a higher order operator (ranging over cardinalities) that, unlike ‘which’ cannot be satisfied DP-internally. So it is predicted that a ‘how many’-phrase cannot depend on a higher order *wh*-item. This is conformed by (23a).

- (23) a. **/??Weshalb/wie sind wieviele Gäste abgereist ?*
 ‘why/how did how many guests leave’
 b. *Wann/*wie sind wieviele Gäste abgereist ?*
 ‘when/how are how many guests departed’
 c. *Welche Gäste sind weshalb/wie abgereist ?*
 ‘which guests are why/how departed’

As shown above, German allows *wh*-subjects in-situ (because they do not require overt checking in a functional spec-position, and therefore are not subject to the operator constraint). So, the deviance of the example (23a) cannot be triggered by the property of being a subject but rather by the semantic type properties.

In sum, the semantic type of the *wh*-element in combination with its structural position is sufficient for modeling the distribution of phrases with DP-internal *wh*-elements. D-linking is thus a dispensable concept. There is no need to additionally immunize some in-situ *wh*-expressions against general well-formedness requirements for in-situ *wh*-phrases.

4. A residue of superiority or a processing effect ?

If superiority (or a minimal link condition, or a shortest move requirement) is a genuine structural constraint, one of its clearest contexts of application ought to be one in which the *wh*-elements are contained in different clausal domains. Data as in (24) are usually cited as cardinal evidence for a superiority phenomenon.

- (24) a. *Who persuaded who(m) [to visit you]?*
 b. **Who_i did you persuade who(m) [to visit e_i]?*
 c. *Who_i did you persuade her [to visit e_i]?*
 d. *Who_i did you persuade e_i [to visit who(m)]?*

In a derivational perspective, the offending property of (24b) is this: a wh-element from a lower clause is moved across a wh-element in the higher clause. In other words: The more distant wh-item is moved, and the wh-element closer to the target position is left in situ. In a representational view, the trace of the moved wh-phrase is c-commanded by a closer potential antecedent (i.e. the in-situ-wh-element). So, in any case, a minimal link requirement seems to provide the empirically correct distinctions. But, there are facts that are less easy to handle. These are known at least since Fiengo's (1980) detailed study (and led Pesetsky to the d-linking proposal):

- (25) a. *Who_i did you introduce [which people] to e_i?*
 b. **Who_i did you introduce who to e_i?*
 c. *What_i did you tell [which people] about e_i?*
 d. **What_i did you tell who about e_i?* (Fiengo 1980:126)

The contrasts between (25ac) and (25bd, respectively, are hard to reconcile with a minimal link condition on movement or on the antecedent-trace relation. (25a,c) obviously violate superiority, because there is an alternative that obeys the minimal link condition. The crucial factor for (25) seems to be the category difference between the wh-phrases involved. Fiengo (1980:125) not only contrasts bare wh-pronouns with DP-internal ones (as in 25) but also with PP-internal ones in contrast with P-stranding (as in (26).

- (26) a. *What_i did you give e_i to whom?*
 b. *[To whom]_i did you give what e_i?*
 c. **Who_i did you give what [to e_i]?²¹*

The result is identical: If the wh-elements are of different categories, there is no superiority effect attested. This is unexpected in a minimal link scenario. Category distinctions should not matter because the crucial property, namely minimal link, is category independent. What matters for a minimal link algorithm is just the property of being a wh-phrase, that is, a phrase with a wh-feature that needs to be checked or licensed. German is particularly instructive because the distinctions much more fine grained, as mentioned already at the end of section 1.²² Apparent superiority effects are found only with wh-elements that are non-distinct in form.

- (27) a. **Wen_i hat er denn wen gebeten [davon e_i abzuhalten]?*
 ,who_{Acc} has he PRT whom_{Acc} asked [to keep away from it]'
 b. *Was hat er denn wen gebeten, für ihn zu erledigen?*
 what_{Acc} has he PRT whom_{Acc} asked for him to carry out
 c. *Wohin_i hat er denn wem versprochen [die Schlüssel e_i zu legen]?*
 where_{PP} has he PRT whom_{Dat} promised [to put the keys]
 d. *Wem_i hat er denn wen gebeten [die Nachricht e_i zu übermitteln]?*
 whom_{Dat} has he PRT whom_{Acc} asked [to transmit the message (to)]

- e. *Wer_i glaubt er/*wer wohl daß e_i ihm seine Arbeit hier bezahlen werde?*
 who thinks he/who PRT that e_i him his work here pay will

The wh-elements in the unacceptable examples (27a) and (27e) are of the same form. In (27b), only the form (animate vs. inanimate) differs, but the case is the same as in (27a). This is sufficient, as the acceptability contrast shows. As expected, category differences (27c) or case-driven form differences (27d) suffice, too. Note, however, that a case difference is not enough, if the form does not differ. For the neuter pronoun there is no case distinction between nominative and accusative in German, and the result is unacceptable (28b). Note that this is independent of the wh-status of the 'was' in the matrix. (28b) is unacceptable even with 'was' construed as an indefinite pronoun. The sheer identity of form in a potential trace position of the fronted wh-element seems to be a sufficient obstacle for the parser in the successful scouting for the wh-movement path.

- (28) a. *Wen/was_i hat dieser Umstand dich bewogen*
 whom_{Acc}/what_{Acc} has this circumstance you prompted
[für diese Aufgabe e_i auszuwählen] ?
 [for this task to choose]
- b. *Wen/*was hat was dich bewogen [für diese Aufgabe auszuwählen] ?*
 whom_{Acc}/what_{Acc} has what you prompted [for this task to choose]
 'whom/what did what/something prompt you to chose for this task'

What these (un)acceptability patterns point to is not a grammar based constraint but a processing restriction. Identity of form (despite differences in grammatical functions) is not a plausible parameter of a principle of grammar but a factor that is obviously relevant for processing. Hence, under these circumstances, the apparent superiority effects can be reconstructed as the break down or the impediment of a processing routine.

The antecedent-gap computation algorithm blocks at the moment in which a wh-element is encountered that is identical in form with the wh-element whose antecedent-gap relation is still under computation. If the trace of the antecedent is conceived of as a copy of the moved antecedent, blocking under identity is the crash at the decision whether the identical element is a copy of the moved one or an independent wh-element *bound* by the moved wh-element. The antecedent-trace relation and the binding relation between a moved wh-element and the in-situ one is formally not distinct, whence the breakdown of the processing algorithm. In other words, the processing conflict is this: When the processor has an uncompleted chain in its buffer, it cannot assign a *second, identical* item it encounters to a different chain, but is bound to automatically analyzing the second item as a trace copy belonging to the current chain, with the result, that in the examples discussed above, the chain structure is deviant.

5. Accounting for cross-linguistic variation

With respect to wh-in-situ constructions, English and German are two extremes in a system space that allows for parameterizations. The German clause structure provides more room for in-situ wh-element than the English one, for the following reason:

German nominative checking is, like in Icelandic, not constrained to a specific structural position, so subjects remain in their VP-internal position, and hence the operator constraint for wh-elements in a spec-position does not become active.²³ In English, in-situ wh-subjects are excluded by the operator constraint. Postverbal manner and reason adverbials in English are too low in structure to c-command their linking domain, that is, the domain of the finite verb. German is an OV language. Adverbs, and in particular manner and reason adverbs precede and c-command the finite verb or its trace and thereby meet the c-command requirement.

Icelandic is a good testing ground. It shares the VO properties with English, but the case checking system with German. In particular, spec I is not the only and obligatory licensing position for the nominative in Iceland, as the quirky subject phenomenon shows. Since nominative is licensed in the VP-internal position, the relation between the subject in the spec I position and its VP-internal base position is different from English. In Icelandic, a fully licensed DP is moved to spec I (with nominative or any other case, if it is a quirky subject). In English, the nominative needs to be licensed by spec-head agreement, so the subject gets licensed in the spec-position. As a consequence, the chain relation between the DP in spec and its base position in English and Icelandic is different. In English, the head of the NP-movement chain is in the licensing position. In Icelandic, an already licensed subject DP is moved to the spec-position.

This difference becomes crucial if the element in spec is a wh-element. In Icelandic, this element is the antecedent of a trace in a case-licensed position. Hence, the trace position qualifies as a variable. In English, however, the trace in the VP-internal subject position is not case-licensed, hence it is not a variable, and hence an English wh-subject in Agr-s cannot satisfy its operator property simply by binding its VP-internal trace. So, the prediction for Icelandic is this: In-situ wh-subjects do not violate the operator constraint and should be acceptable, *ceteris paribus*. An example is given in (29a). (29b) confirms that postverbal higher order adjunct wh-elements behave like in English. They are excluded because of the domain mismatch.

- (29) a. *Hvað hefur hver gefið börnunum?* (Ottósson 1989, Hálldor Sigurðsson, p.c.)
 what has who given children-the
 e. **Hvað hefur hver_i gefið börnunum hvers vegna?*
 what has who given children-the why

Dutch and German are siblings with respect to OV properties, but differ in the case checking system. Dutch does not have overt morphological case distinctions in the non-pronominal paradigms. Moreover, subtle differences in the clause internal organization indicate that in Dutch at least transitive subjects are in a VP-external position. I shall briefly mention two contrasts: First, Dutch unlike German does not allow pronoun fronting across transitive subjects (30b), and Dutch requires an expletive in impersonal passives (31b) vs. (31e):

- (30) a. *daß ihm jemand Bücher gab* (Ge.)
 that him someone books gave
 b.* *dat hem iemand boeken gaf* (Du.) (= 30a)
 c. *dat iemand het (aan) Jan gaf* (Du.)
 that someone it (to) Jan gave

Given that the left boundary of the VP is the barrier for pronoun fronting, the different fronting options indicate different boundary conditions: In German the VP spans the whole 'mittelfeld'; in Dutch, the 'mittelfeld' provides a structural subject position.

Dutch requires an expletive, just like English, if there is no other element available for the structural subject position, as for instance in the case of locative preposing. (31a) and (31c) are analogous in this respect. The incompatibility of *do*-support with locative preposing in English demonstrates that the locative is indeed in relation with the subject position.

- (31) a. *In deze hoek werd (er) volgens mij gefluisterd* (Du.) (Paardekoper 1963:55)
 in this corner is (there) according-to me whispered
 b. *Werd *(er) gefluisterd (in deze hoek)* (Du.) (Paardekoper 1963:55)
 c. *On this spot (there) will stand a huge tower - On which spot stood a huge tower ?*
 d. *Will *(there) stand a huge tower on this spot ?*
 e. *Wurde (*es) geflüstert in dieser Ecke ?* (Ge.)
 was there whispered in this corner

German does not allow an expletive. This cannot be blamed on (expletive) pro-drop, because German does not allow dropping pronouns, neither referential ones nor quasi-arguments, nor expletive ones, as (32) illustrates:

- (32) a. *Hat *(es) geregnet in der Nacht?* (quasi argument)
 has it rained in the night
 b. *Hier lebt *(es) sich gut* (intransitive middle construction)
 here lives it itself well ('here one lives well')
 c. *War *(es) sehr unangenehm, daß kein Taxi kam?* (extraposition)
 was it very unpleasant that no taxi arrived
 d. *Wurde (*es) getanzt? - Es wurde getanzt*²⁴ (Ge.) (intransitive passive)
 was it danced - It was danced
 e. *daß (*es) getanzt wird* (Ge.) vs. *dat *(er) gedanst wordt* (Du.) (intr. passive)
 that it danced is vs. that it danced is

In combination, these two sets of facts show that there is good reason to assume that the Dutch clause structure provides an overt structural subject position. But, Dutch shares with German and Icelandic the property of relational case checking for the nominative.

In sum, given these structural properties of the Dutch clause, Dutch should allow in-situ wh-subjects since they are either VP-internal or they are in a configuration like in Icelandic, binding a variable in the form of the trace of a case-licensed DP. The judgments²⁵ for the object-subject order is less uniform, than one would expect. Higher adverbials in-situ are judged acceptable, as expected (33c).

- (33) a. *Ik weet niet wat wie gekocht heeft* (perfect: 4; ?: 7; *: 8)
 I know not what who bought has
 b. *Wie weet wat wie gekocht heeft voor zijn zusje ?* (perfect: 8; ?: 3; *: 8)
 who knows what who bought has for his sister
 c. *Wie heeft het waarom gedaan ?* (perfect: 19)
 how has it why done

The fact that in Fanselow's survey, there is a substantive minority, namely 8 informants out of 19, who objects against (33 a,b) shows that further investigation is necessary in order to identify intervening factors that account for the variation.

Hungarian multiple wh-questions (Kiss 1993: 98-101) support the basic tenet of the discussion above, too. Superiority, minimal links, or shortest moves are not primitive constraints of universal grammar. They are epiphenomenal. Hungarian wh-patterns do not reflect a simple superiority condition:

- (34) a. *Kinek mit hozott János* (Kiss 1993: 98)
 who_{Dat} what_{Acc} bought John
 b. *Mit kinek hozott János*
 what_{Acc} who_{Dat} bought John
 c. *Mit ki akar?* (Kiss 1993: 101)
 what who wants?

The constraints that Kiss (1993) found to be operative in Hungarian are not structural locality conditions but conditions that rest on the semantic type and content of the elements involved.

6. The grammar of wh-in-situ in wh-movement constructions

A wh-element in the topmost spec-position of a clause ('spec C') is directly licensed. Either it is *checked in a spec-head configuration* of a selected head (subcategorization, in case of an indirect question), or it is directly interpreted by *clausal typing*, as a mood indicator²⁶ (in the case of an interrogative main clause). An in-situ wh-element is *indirectly licensed*: It must be *bound* by a licensed wh-element. If it is not bound, it cannot be interpreted as a wh-element, with the exception of an echo-questions interpretation, of course, which is an erotetic²⁷ utterance, but its form (Satzmodus = sentence mood) is not interrogative.

Note, eventually, that an account of in-situ licensing in terms of binding rather than covert wh-movement does not get into the well-known difficulties with constructions that defy the standard constraints for wh-movement. Covert wh-movement ought to be blocked (given the standard constraints on movement) when the in-situ element is contained in an adverbial clause (35a), or in an indirect question (35b), or in a predicative phrase (35c), since overt wh-movement is ungrammatical in all these contexts. Binding, however, is unproblematic, of course.

- (35) a. *Wer ist abgereist [bevor man wen vermisst hat] ?*
 who has left [before one who missed has]

- b. Wer hat gesagt, [wieviel wer bezahlt hat] ?
 who has said [how much who paid has]
- c. Wer ist [womit unzufrieden] weggegangen ?
 who has [what-with discontent] left ?

7. Summary and Conclusion

Let me summarize the claims made above: In-situ wh-items are licensed indirectly. Indirect licensing is subject to various constraints, some of which apply to any human language, and some of which are type dependent. A cross-linguistically universal constraint is the *semantic type restriction*. Higher-type wh-elements cannot license a wh-element of a higher type. This is the constraint that covers the universally exceptional behavior of *why* and *how*. The additional restrictions for *why* and *how* in VO languages, that are also type driven, are the effect of a *domain condition*. In OV languages, in contrast to VO languages, the c-command requirement for higher order wh-adjunct cannot be satisfied, if the preverbal position is not available, whence the contrast between OV and VO languages. Note that the domain condition in itself is a universal constraint, but the contexts where it can apply are provided only by VO languages and not by OV languages.

The third constraint (*obligatory operator constraint*) is structurally geared. A wh-element in-situ that is licensed in a spec-position is an obligatory operator. This accounts both for the ungrammaticality of a nominative wh-in situ in VO-languages and the ‘amnesty phenomenon’, when the in-situ nominative binds a variable, either in form of another in-situ wh-element or in form of a bound pronoun.

The final constraint of the four constraints discussed in this paper (*minimal binding constraint*) is the relative minimality restriction for indirect licensing that accounts for the phenomenon that an interrogative with a higher-type wh-element in spec may contain an indirectly licensed higher-type wh-element, but only if this is c-commanded by an indirectly licensed wh-element of the appropriate type. Note that this is a minimality requirement, but crucially not a bijection requirement,²⁸ because a wh-element in spec may well license more than one wh-phrase in situ, if the in-situ elements are not in a c-command relation, as illustrated by the well-formed construction (36):

- (36) Welcher Frau hast du gesagt, als sie wen suchte,
 which woman_{Dat} have you told, when she whom looked-for,
 daß du ihn wo vermutest ?
 that you him where suspected

In this example, the in-situ wh-elements are contained in extraposed clauses, and none of them c-commands the other. So they must be both indirectly licensed by the moved wh-element in the matrix clause.

In conclusion, the wh-in-situ constructions do not call for an account in terms of MLC. In a cross-linguistic perspective the set of English ‘superiority’ data turn out to be conditioned by

independent constraints, most of which belong to the syntax-semantics interface. There is only a small residue of data that the MLC could be made responsible for, namely the general resistance of extracting a *wh*-element from an embedded clause into a higher clause, across a *wh*-element in the higher clause, as illustrated in (3a). But (3b), the German example, already suffices to cast doubt on an MLC solution for (3a). If (3a) is ruled out by a universal restriction on minimal links, the very same restriction ought to apply to German. Hence it seems more profitable to look for a processing solution for the English data, on a par with the German data discussed in section 4.

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Notes:

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² Chomsky 1973, p.246: "No rule can involve X,Y in the structure [...X...[...Z...WYV...]...], where the rule applies ambiguously to Z and Y and Z is superior to Y." 'Superior' is defined as follows: "Category A is superior to category B in the phrase marker if every major category dominating A dominates B as well but not conversely."

³ Note that this has consequences for theories that take in-situ wh-elements to be licensed by covert movement to Spec-C. In this case it is not obvious why a third wh-element may lift the ban against the co-occurrence of two higher-type adverbial wh-elements.

⁴ Example from the web [Source: http://www.oif.ac.at/aktuell/news_05_2002_wedding.html]:

i) *Warum wer wie heiratet.*
why who how marries

⁵ Judgments vary across informants between more severe and less severe deviance.

⁶ Examples are easy to find in the media:

i) *Wo wer im Schwimmbad hingehört, weiß offensichtlich jede*
,where who in-the swimming-bath belongs-to knows obviously everyone'
(source: DIE ZEIT #32, 1988, p.41)

ii) (Woran wir würden oder:) *Wie wird wer Akademiker?* (source: PRESSE, 1996, edition 18.5.)
how becomes who (an) academic?

iii) *Aber was hat wer der Leiche zuvor aus dem Mund entfernt?*
But what has who the corpse before out the mouth removed

Source: http://www.berliner-lesezeichen.de/lesezei/Blz00_06/text18.htm

iv) *Welcher W-Frage die größte Bedeutung zukommt ist Ermessenssache:*

which wh-question the greatest importance deserves is a matter of opinion:

Wer hat was getan? Was hat wer getan?
Who has what done? What has who done?

Source: <http://www.bgvnet.de/gwm/webdbs/xs/xs9007.nsf/6ab7553e18beec34c12569f9006091af/715586135da51aac1256c8300527ae9?>

v) *Wie war das in der Raumfähre, was hat wer gesprochen?*
How was it in the space shuttle, what has who said

Source: http://www.timewarp-news.de/Raum/Archiv-Raumf_/Apollo/hauptteil_apollo.html

⁷ The source of this observation, as acknowledged by Chomsky (1981:27, is Jane Grimshaw, Richard Kayne, and Leland George.

⁸ In addition to this type of amnesty phenomenon, it is predicted that the patterns in (7) improve if the in-situ wh-subject is able to bind a variables:

i) *It is unclear who thinks that whoⁱ needs to consult hisⁱ doctor.*

ii) *It is unclear who thinks that whoⁱ saw whomⁱ.*

⁹ I am grateful to Gisbert Fanselow for this information.

¹⁰ Note that checking for covert features (e.g. an EPP-feature) or checking by obligatorily empty functional heads (e.g. agr-object) either does not exist or does not interfere with the obligatory operator property of subjects in spec-positions. I prefer the first alternative.

¹¹ Kiss (1993) draws the line in terms of specificity. In her analysis, 'why' and 'how' are inherently non-specific.

¹² i) *ver hot vi azoy /farvos gezungen* (Diesing 2001, ex. 8,9)
who has how /why sung

¹³ Here is one of the numerous cases found in the web:

i) *Es ging darum, was Medienleute und Meinungsforscher meinten, wer wie rüberkam.*
It was a question of what media people and pollster thought, who how came-across
Source: <http://www.spiegel.de/jahreschronik/0,1518,225790,00.html>

¹⁴ The potential relevance of the 'was-für' construction was suggested to me by Gereon Müller (p.c.).

¹⁵ 'Was-für split' is an optional variant of a wh-pied piping construction of a DP of the form 'was für (ein) NP' (what-for a NP; = 'what kind of NP'). Instead of pied-piping the whole DP, the wh-element 'was' is fronted. In semantic terms, this element does not quantify over individuals but over sets (namely *kinds*).

¹⁶ Note that the constraint rules out distributive readings (i.e. multiple pair list answers) generated by higher type operators. It does not necessarily rule out a *single pair* answer (no distributive reading), and it does not apply if 'how' is interpreted as 'in which manner/way', that is, if *how* is type-shifted to an individual type (i.e. a set of manners/ways). This may be responsible for variations in informant judgements as reported to me by Gisbert Fanselow: In a survey by Susan Fischer and Joanna Blaszczak in Potsdam (research group FOR 375, project A3), *warum*>*wie* (why>how) got starred less often than *wie*>*warum* (how>why).

¹⁷ Costa (2002, ex. 83a), however, notes that *porque* may appear postverbally in a single-wh question: *disseste isso porque?* - you said that why?

¹⁸ Costa (2002, sect. 3.2) adduces evidence in favor of Rizzi's base generation proposal from Kuno & Takami (1993), who note that *why* and *how* can be followed by a parenthetical expression, but not *when* and *where*: "*Why/how/ *when /*where, man, did you meet this lady?*". Costa suggests that *why* and *how* are base-generated as CP-adjuncts. This account, however, is contradicted by (19c): If *how* were base generated it would not show a negative island effect.

¹⁹ As it is well known, a quantifier can bind any number of pronominal variables in its domain.

²⁰ Pesetsky (1987) : Wh-phrases are quantifiers (p.100). *D-linked* wh-phrases are *not* quantifiers (p.108).

²¹ Note: This is Fiengo's judgement (1980:123).

²² For a more detailed discussion see Fanselow (1991: 330), Müller (1995: 323f.), and Haider (2000).

²³ This formulation intentionally leaves room for two possibilities: the possibility I hold, that German subjects never leave the VP, except when they are moved to spec C, and the possibility that German subjects do not need to leave the VP-internal subject position for a higher functional spec position, but that they have the possibility.

²⁴ Note that the 'es' in this example [i.e. the third one in (32d)] is an expletive, but in the spec C position, and crucially not in the subject position. This shows that German has an expletive, but must not use it as a structural subject expletive. The natural conclusion is: If there is no expletive, there is no structural subject position.

²⁵ The report on the judgements I owe to Gisbert Fanselow: In a questionnaire-based inquiry among 19 native Dutch linguists he got mixed results, given in brackets for each example in (33).

²⁶ Clausal *mood* or *force* is: interrogative, declarative, or imperative.

²⁷ I.e. the illocutionary force is that of a question.

²⁸ *Bijection* would mean that a licensed wh-element could license not more than one wh-element: Licensor and licensee would have to be in a 1-to-1 relation.