

Wh-quantifier float in German*

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1. Introduction

German *wh*-questions can be “modified” by the quantifier *alles* ‘all’, known as “invariant *alles*” in the literature (see, e.g., Pafel 1991, Giusti 1991, Reis 1992, Beck 1996, Zimmermann 2007, Heck and Himmelreich 2017). This paper investigates the syntactic distribution of *alles*. *Alles* can appear in various positions in the sentence, leaving the overall meaning contribution unchanged. It can appear right-adjacent and in one constituent with the *wh*-phrase that *alles* “associates” with – henceforth termed the *associate* –, but it can also appear “floating” at a distance from its associate; see (1a-b), respectively.

- (1) a. [CP [Wen **alles**]₁ [C' hast du e₁ angerufen]] ?
who.ACC ALL have.3SG you.NOM called
'Who all did you call?'
- b. [CP Wen₁ [C' hast du e₁ **alles** angerufen]] ?
who.ACC have.3SG you.NOM ALL called
'Who all did you call?'

In fact, *alles* can appear in various positions in the clause, though never in more than one at a time for a single *wh*-question. (Curly brackets thus indicate mutually exclusive options.)

- (2) (Und) *wen* {**alles**} hat {**alles**} der Peter {**alles**} gestern
and who.ACC ALL have.3SG ALL the.NOM Peter ALL yesterday
{**alles**} eingeladen?
ALL invite
'(And) who all did Peter invite yesterday?'

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Two families of analysis exist for explaining the distribution of quantifier float: ones that assume a common source between adjacent and floating instances of quantifiers, and ones that assume different sources for the two. (For a more comprehensive survey of theories of quantifier float see Bobaljik 2003.) I term the two camps according to their starting assumption and state them in (3-4), respectively.

- (3) *Same Source hypothesis* (SSH):¹
Floating quantifiers originate in a First-Merge constituent with the associate.
- (4) *Different Source hypothesis* (DSH):²
Floating quantifiers are a particular class of clausal adverbs.

Reis (1992), building on Pafel 1991, argues that *alles* can occur (a) right-adjacent to its associate, (b) non-adjacent, in the base position of the associate, and (c) non-adjacent, in positions that its associate can reach via scrambling. By extending and consolidating these findings, I argue that the distribution of floating *alles* is best characterized by the generalization in (5).

- (5) *Distribution generalization for floating alles*:
Given a derivation, floating *alles* occurs in a subset of the positions that its associate occupied in that derivation.

I conclude that the SSH is the only natural *explanation* for the distribution of *alles* as characterized in (5) (pace Heck and Himmelreich 2017, who instead make a case for a DSH approach to invariant *alles*³). In fact, the SSH entails that the associate and the quantifier are separated via some stranding procedure which will inevitably include movement.⁴ For example, *stranding* could be the result of sub-extracting the associate from the shared constituent, as schematized in (6a), or it could be the result of movement of the full constituent followed by scattered deletion, see (6b). (I will generally remain agnostic in this paper as to what the stranding procedure is.)

¹ This includes *floating* analyses, for example, Dougherty 1970, Postal 1974, Kayne 1975, and *stranding* analyses, for example, Sportiche 1988, Shlonsky 1991, Merchant 1996, McCloskey 2000, Henry 2012.

² For example, Dowty and Brodie 1984, Doetjes 1992, Bobaljik 1995, Koopman 2010.

³ Their analysis is part of a larger argument for order-preserving movement to the phase edge. The facts motivating their analysis of *alles* are intervention effects between *alles* and indefinites. I cannot go into detail for reasons of space, but note that (i) the availability of *alles* to the left of subjects is impossible in their system, but attested, see (2), and (ii) that it seems to me that some (but perhaps not all) of the data can be captured by stranding given (a) argument structure, and (b) independent movement restrictions on indefinites.

⁴ I note in passing that a *stranding* analysis based on the SSH is more consistent with generalization (5) than a *floating* analysis (see footnote 1)—a floating analysis is consistent with *alles* having a distribution that is not just a subset of the associate’s distribution, because in such an analysis the quantifier is moved out of the shared constituent with a quantifier-specific operation.

I also note that adjoining *alles* anti-cyclically (as e.g., late adjunction of relative clauses in Labeaux 1988) is in principle an option to capture the generalization in (5) without making recourse to movement. This seems to be essentially what Reis (1992) proposes as she narrows in on the description of *alles* as a “*wh*-trace clitic”.

- (6) a. *Stranding as sub-extraction:*
[_{CP} WH [_{C'} ... [_{WH} alles] ...]]
- b. *Stranding as scattered deletion:*
[_{CP} [_{WH} alles] [_{C'} ... [_{WH} alles] ...]]

This analysis entails, with no recourse to further assumptions, that the distribution of the quantifier is bounded by the distribution of the associate, which will be argued to be the correct result.

Finally, the evidence making up the core generalization in (5) argues that (a) *wh*-movement proceeds successive-cyclically through a clause-medial projection, presumably *vP*, (b) floating *alles* is diagnostic of \bar{A} -traces (links of the \bar{A} -chain), and (c) (object) scrambling in German is always *A*-movement.

The paper is organized as follows. Section 2 outlines some basic properties about *alles*. Section 3 argues that the distribution of floating *alles* is limited to the base position of the associate, and any position the associate can move to. Section 4 argues that the distribution is further restricted to tails of \bar{A} -movement of the associate. Section 5 concludes.

2. Basic properties of *alles*

Before moving on to the facts making up generalization (5), some basic properties of *alles* that will be relevant ought to be pointed out. First, as the traditional name suggests, *alles* is morphologically *invariant*. It does not inflect for ϕ -features.⁵ Second, *alles* is always de-stressed—it cannot bear the constituent focus of a focused VP, or it cannot be contrastively focused itself. Third, *wh*-questions with *alles* are interpreted in a way that one is compelled to give an exhaustive answer. Specifically, a list of answers is expected, so that a plurality of answers is presupposed and a single functional answer is not felicitous. For the interpretation of *alles*, see Reis 1992, Beck and Rullmann 1999, Zimmermann 2007. Fourth, *alles* primarily appears in *wh*-dependencies: interrogative and non-interrogative *wh*-questions, as well as in echo *wh*-questions. Possibly, *alles* is marginally acceptable also in restrictive relative clauses; the judgments are relative to appositive relatives. For more details see again Reis 1992.

3. Distribution

3.1 Associate's base position

German has overt *wh*-movement akin to English, so that the *wh*-associate of *alles* moves from a thematic base position to Spec,CP.⁶ This section shows that *alles* can occur in the

⁵ An inflecting variant can be found in *wh*-questions with complex associates, too, but there are obvious differences between these two kinds of quantifiers (in particular, see Reis 1992). Similarly, *alles* should also be kept separate from the homophonous expression occurring in predicative environments (see Giusti 1991).

⁶ I will assume a fairly standard analysis of *wh*-movement throughout the paper, following the core insights in Chomsky 1973, 1977, 1981, Lasnik and Saito 1992: interrogative *wh*-phrases move into the domain

associate's base position by making use of two diagnostics: (i) the position of object *wh*-indefinites; (ii) focused adverbs. Both diagnostics restrict movement options. This is important given that German has "scrambling", that is (relatively) free word order. I follow a long tradition after Ross (1967) that analyzes scrambling as movement to a clause-medial position; see Müller 1996, 1998 for an argument for movement based on A-over-A effects. Scrambling, together with the distribution of verbs in German—finite verbs exhibit verb-second (V2), moving to C⁰ in matrix clauses, while all other verbs stack up on the right edge of the clause—obscure base positions.

Wh-indefinites make it possible to circumvent the above mentioned problems of scrambling and V2 as they are very restricted in their movement options. For one, they cannot appear in Spec,C, to the left of the finite verb in matrix clauses; see (7a). And more importantly, scrambling of a *wh*-indefinite is not always possible.⁷ Example (7b), where the accusative (ACC) object appears in a typical scrambling position to the left of the subject, is at least odd. ((7b), as preferably all examples in this paper should be read without rising intonation focus; such intonations are known to make word order more free in German, obviating known word order generalizations like Lenerz' Generalization (Lenerz 1977).)

- (7) a. *Wen habe ich gesehen.
 WND.ACC have.1SG I.NOM seen
Intended: 'I saw someone.'
- b. ??dass wen {keiner / 'n Lehrer} gesehen hat.
 that who.ACC no-one.NOM a.NOM teacher seen have.3SG
 'that no-one/a teacher saw someone.'

Where scrambling a *wh*-indefinite is natural, interpretation is affected. For example, ACC is interpreted as non-specific with the order dative (DAT)>ACC, while it is interpreted as specific in the order ACC>DAT; see (8). In the terminology of Diesing (1992), the two readings correspond to the *existential* reading, which asserts the existence of the referent of ACC, and the *presuppositional* reading, which presupposes the existence of the referent of ACC.

- (8) a. weil du wem was vorenthalten hast
 because you.NOM who.DAT what.ACC withheld have.2SG
 'because you kept something from someone'
- b. weil du was wem vorenthalten hast
 because you.NOM what.ACC who.DAT withheld have.2SG
 'because there is something that you kept from someone'

of a correspondingly interrogative C [COMP], obeying whatever constraints on movement give rise to island effects, subjacency effects, superiority effects and so forth.

⁷ Haider (1993:200, footnote 2), for instance, claims that *wh*-indefinites cannot scramble. See also Frey and Pittner (1998) on movement restrictions on existential *wh*-indefinites.

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Similarly, DAT to the left of the particles *ja doch*, one of the original diagnostics used by Diesing, yields a presuppositional reading, while DAT to their right an existential one:

- (9) a. weil du wem *ja doch* was vorenthalten hast
because you.NOM who.DAT PARTICLES what.ACC withheld have.2SG
'because you kept something from someone'
- b. weil du *ja doch* wem was vorenthalten hast
because you.NOM PARTICLES who.DAT what.ACC withheld have.2SG
'because you kept something from someone'

Given these restrictions, it stands to reason that the existentially interpreted *wh*-indefinite in (8–9) is in its base position, just like Diesing argued for indefinites more generally. In light of this, consider (10a):

- (10) a. Weißt du, [_{CP} was₁ der Lehrer [_{VP} wem [_{e₁} **alles**
know.2SG you what.ACC the.NOM teacher who.DAT ALL
gezeigt haben soll?
shown have MOD.3SG
'Do you know what all the teacher supposedly showed to someone?'
- b. Ne, nur, dass er wem 'ne Schlange gezeigt haben soll.
no only that he who.DAT a.ACC snake shown have MOD.3SG
'No, just that he supposedly showed someone a snake.'

In (10a), *alles* is associated with the ACC *wh*-phrase and occurs between the DAT *wh*-indefinite and the verb. The DAT argument can be interpreted existentially, so that we can take it to mark its base position. In addition, *zeigen* 'show' is a verb where the DAT object asymmetrically *c*-commands the ACC one: the DAT quantified DP can bind into ACC, but not vice-versa; compare (11a-b).

- (11) a. dass sie [keinem Schüler]_i sein-en_i neuen Mitschüler gezeigt hat.
that she no.DAT student his-ACC new peer shown have.3SG
'that she showed no student their new peer.'
- b. *dass sie sein-en_i Mitschülern [kein-en neuen Schüler]_i gezeigt hat.
that she his-DAT.PL peers no-ACC new student shown have.3SG
'that she showed no new student to their peers.'

Given that *wem* is in its base position, and that the underlying structure is DAT>ACC, I conclude that *alles* is in the base position of the ACC associate in (10a). *Alles* can occur in the base position of its associate.

This fact follows immediately from the SSH in (3), but needs auxiliary assumptions were the DSH in (4) the correct hypothesis for floating *alles*. For example, to capture the

base position fact, analyses based on the DSH require order-preserving movement, like Heck and Himmelreich (2017) propose for *alles*, or massive word-order motivated remnant movement, like Koopman (2010) proposes for Dutch *allemaal* and West Ulster English *all*.

3.2 Positions reached via scrambling

Alles can equally occur in positions that its associate can reach via scrambling. Trivially, building off of (10a), *alles* associated with the ACC object can also occur to the left of the DAT object:

- (12) ...*was*₁ der Lehrer {**alles**} [_{VP} wem [*e*₁ gezeigt haben soll?
 what.ACC the.NOM teacher ALL who.DAT shown have MOD.3SG
 ‘(Do you know) what all the teacher supposedly showed to someone?’

Given that the base structure of *zeigen* ‘show’ is DAT>ACC, whether DAT marks its base position or not, *alles* is necessarily in a derived position—specifically, a scrambling position. The same applies in (13).

- (13) *Was* hat der Lehrer {**alles**} den Schülern {**alles**} gezeigt?
 what.ACC have.3SG the.NOM teacher ALL the.DAT students ALL shown
 ‘What (all) did the teacher show the students?’

The *wh*-phrase *was* first scrambles to a clause-medial position (*vP* or *TP*), and then *wh*-moves to Spec,C, stranding *alles* in the scrambling position. In fact, that is a position that the *wh*-phrase can scramble to independently in multiple-*wh* questions, where only one *wh*-phrase *wh*-moves to Spec,C, and the “in-situ” *wh*-phrase is free to scramble:

- (14) Wer hat {*was*} den Schülern {*was*} gezeigt?
 who.NOM have.3SG what.ACC the.DAT students what.ACC shown
 ‘Who showed the students what?’

Conversely, *alles* **cannot** occur in positions that its associate **cannot** reach via scrambling. There is a subject-object asymmetry with regard to clause-medial movement in German; subjects can move a little higher than objects (see for example Merchant 1996, Müller 2001, Müller 2011). One place where the asymmetry becomes visible is with phonologically weak object pronouns (so-called *Wackernagel* pronouns); compare (15a-b).

- (15) a. weil {*Maria*} ihm {*Maria*} gerne *was* abgibt.
 because *Maria*.NOM him.DAT *Maria*.NOM gladly what.ACC give.away.3SG
 ‘because *Maria* gladly gives him something.’
 b. dass {*den Apfel} ihm {den Apfel} keiner abgibt.
 that the.ACC apple him.DAT the.ACC apple noone.NOM give.away.3SG
 ‘because no-one gives him the apple.’

The subject *Maria* in (15a) can occur on either side of the weak object pronoun *ihm*. In contrast, the object *den Apfel* in (15b) can only occur to the right of the weak object pronoun. In (16) *alles* follows the same pattern. *Alles* can occur on either side of *ihm* when associated with the subject *wer*, but it can only occur on the right of *ihm* when associated with the subject *was*.⁸

- (16) a. (Und) *wer*₁ wollte {**?alles**} ihm {**alles**} gestern *e*₁ 'ne Lektion
and who.NOM wanted ALL him.DAT ALL yesterday a lesson
erteilen?
assign
'(And) who all wanted to teach him a lesson, yesterday?'
- b. *Was*₁ wollte {**?*alles**} ihm {**alles**} keiner *e*₁ geben?
what.ACC want.PST.3SG ALL him.DAT ALL noone.NOM give
'What all did no-one want to give him?'

Overall, *alles* can occur in positions that its associate can reach via scrambling, and it cannot reach positions that its associate cannot reach via scrambling. These findings replicate similar findings by Reis (1992). The fact that the availability of *alles* in scrambling positions follows the movement options of its associate (subject vs. object) follows immediately from a stranding analysis based on the SSH in (3). An analysis based on the DSH in (4) would need to stipulate a property specific to the lexical item *alles* that ensures a certain kind of locality (cf. Heck and Himmelreich 2017). Unless there is independent reason to do so, such properties redundantly re-encode the associate's derivation.

3.3 Positions reached via successive-cyclic *wh*-movement

The set of positions of *alles* now includes (a) the base position of the associate, and (b) positions its associate can reach via scrambling. *Alles* can also occur in intermediate positions of long-distance *wh*-questions (for those speakers that allow long-distance *wh*-movement in the first place—a feature of southern varieties). Consider (17).

- (17) [_{CP1} *Wem*₁ hat der Peter {**alles**} gemeint, [_{CP2} dass die Maria *e*₁
who.DAT have.3SG the Peter ALL said that die Maria
{**alles**} geholfen hat]]?
ALL helped have.3SG
'Who all did Peter say/think that Mary helped?'

⁸ With subject questions the facts are actually a little more complicated. It is not hard to find examples where *alles* to the left of a weak object pronoun is much worse than to its right, and equally bad as an object-associated *alles* to the left of the same pronoun. It seems to me, however, that when the information structure, and, accordingly, the intonation is right, *alles* to the left of the pronoun in NOM-questions can be natural, or at least clearly more natural than in ACC-questions. The interaction is what matters; of course, interactions may require more formal methods for reliability. When *alles* is to the left of the weak pronoun, I read a question like (16a) with focus on the adverb, and the referents of the subject and the weak pronoun backgrounded.

First, *alles* could not have been generated in that position independent of long-distance *wh*-movement. For one, *alles* cannot occur in an embedded clause when the only *wh*-dependency of the sentence is contained within the matrix clause. This is shown in (18a). Conversely, *alles* cannot occur in the matrix clause of a sentence where the only *wh*-dependency is contained within the embedded clause, as shown in (18b).

- (18) a. [CP₁ *Wem*₁ hat der Peter *e*₁ {alles} erzählt, [CP₂ dass die Maria {*alles} der Susi geholfen hat]]?
 who.DAT have.3SG the.NOM Peter ALL told that
 the.NOM Maria ALL the Susi.DAT helped have.3SG
 ‘Who all did Peter tell that Maria helped Susi?’
- b. [CP₁ Der Peter hat {*alles} gewusst, [CP₂ *wen*₁ die Maria *e*₁ {alles} liebt]].
 the.NOM Peter have.3SG ALL known who.ACC the.NOM
 Maria ALL love.3SG
 ‘Peter knew who all Maria loves.’

The contrasts in (18) indicate that *alles* must be a clausemate of a chain link of its associate. It makes sense, then, that matrix *alles* in (17) is acceptable, while, for example, matrix *alles* in (18b) is not.

Alles is also acceptable in the intermediate clause of questions spanning three clauses (within the limits that multiple embeddings are acceptable, of course):

- (19) ?(Und) [CP₁ *Wem*₁ hat der Peter {alles} gemeint, [CP₂ dass der Toni and who.DAT have.3SG the Peter ALL said that the Toni {alles} behauptet hat, [CP₃ dass die Maria *e*₁ {alles} geholfen hat]]]?
 ALL claimed have.3SG that die Maria ALL helped have.3SG
 ‘Who all did Peter say/think that Toni claimed that Mary helped?’

For (19), it is a priori less clear how clausemateness is satisfied for *alles* in the intermediate clause (CP₂). However, if we assume that long-distance *wh*-movement is bounded to apply in small successive-cyclic steps (Chomsky 1973, 1977), and in particular that *wh*-movement can stop in clause-medial positions (Chomsky 1986, 2000, 2001), then clausemateness is satisfied by the chain link of *wem* left by the stop-over in CP₂. The facts in (17–19) thus constitute evidence for the notion of successive-cyclic long-distance movement.

In addition, the facts of the previous two sections indicated that *alles* appears not only in the same clause as a chain link of the associate, but directly in the position that a chain link occupies. I conclude that *alles* in intermediate positions of long *wh*-movement indicates that the *wh*-associate can move successive-cyclically through a clause-medial projection.⁹

⁹ One would expect *alles* to be possible also in intermediate Spec,C positions under these circumstances. This is not the case. Henry (2012) proposes an approach to quantifier float that assumes that the union of all

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Based on standard Phase Theory (Chomsky 2000, 2001), the null hypothesis is that the projection is *vP*, the projection that introduces the external argument. In fact, there is some evidence suggesting that it is. Recall that weak object pronouns occur relatively high in the clause, that is rather far on the left such that they can only be separated from the finite verb by subjects and certain adverbs (recall the subject-object asymmetry in (15a-b)). Müller (2001) proposes that phonologically weak object pronouns occur in the leftmost edge of *vP*. The proposal could even be generalized to state that they occupy the leftmost edge of whatever projection they occur in. This seems a reasonable assumption to me, so I will adopt it without further discussion. With this in mind, consider (20).

- (20) *Was*₁ hat [TP der Peter [_{vP} {***alles**} [_{vP} ihm [_{vP} {**alles**} gestern
 what.ACC have.3SG the Peter ALL him.DAT ALL yesterday
 [_{vP} {**alles**} erzählt, [_{CP} dass die Maria *e*₁ gekauft hat]?
 ALL told that the Maria bought have.3SG
 ‘What all did Peter tell him yesterday that Maria bought?’

Alles can occur to the right of the weak object *ihm* but not to its left. If the sentential adverb *gestern* cannot be generated in VP, it follows that in (20) the weak pronoun is in *vP*, and that the subject is in TP, as indicated in the structure. *Ihm* cannot be in VP because it must be at least in the projection of the adverb, higher than VP by assumption. Assuming the functional hierarchy *C>T>v*, *ihm* can also not be in TP because the subject can at most be in TP since the finite verb is in *C*⁰. The only way to have *ihm* follow the subject is to have them in separate projections: the subject in TP and *ihm* in *vP*.

With this much in mind, (20) indicates that acceptable *alles* in (20) can be as high as *vP*, but not higher. The following example additionally suggests *alles* occurs outside of VP:

- (21) *Context*: it’s about what Peter did.
 a. Max: Die hat’s wem erzählt.
 ‘Max: She’s told it to someone.’
 b. Maria: Und *was*₁ hat sie {**alles**} [_{vP} wem {***alles**} erzählt,
 and what have.3SG she.NOM ALL who.DAT ALL told
 [_{CP} dass der Peter *e*₁ gemacht hat]?
 that the.NOM Peter done have.3SG
 ‘Maria: And what all has she told someone that Peter did?’

In (21), *alles* can occur only to the left of the matrix *wh*-indefinite DAT argument. This is in contrast with the facts in (10a) and (12). There, *alles* was a co-argument of the DAT argument and, as argued, because of that able to occur on either side of the DAT *wh*-indefinite.

languages produces the set of float positions equivalent to the set of all movement positions made available by UG. In such an approach, gaps that do not follow from independent grammatical restrictions are a matter of learning from positive evidence. The fact remains that no speaker accepted *alles* in Spec,C so far, and so the question remains whether there is a deeper reason for this gap, and what that might be.

In other words, *alles* cannot occur in VP in (21), at least not in the thematic core of it. Thus, this section argues for successive-cyclic *wh*-movement through *v*P in German.

The facts again follow from a stranding analysis based on the SSH in (3). An analysis based on the DSH in (4) would instead need to redundantly encode locality restrictions in order to rule in (17) and (19) while ruling out sentences with non-clausemate associates like (18a) or (18b).

4. \bar{A} -restriction

The distribution of *alles* is not just bounded by the positions that its associate can occupy in a given derivation, it is also bounded by the kind of movement its associate underwent. Specifically, *alles* cannot occur in positions from which its associate A-moved. This is an interesting property as McCloskey (2000) independently argues that the same is true for *wh*-quantifier float in West Ulster English, and Fitzpatrick (2006) for Russian, Korean and Japanese. While this property does not directly follow from the SSH in (3), the SSH is the most likely candidate for providing a natural explanation for an A/\bar{A} -asymmetry given that the restriction is about the tail of the associate's movement, and the A/\bar{A} distinction applies to movement which is necessarily involved with stranding.

I provide one diagnostic configuration here, which was also employed by Fitzpatrick (2006), anti Weak Crossover effects. (Refer to work in preparation for additional evidence based on Superiority effects, Raising, and Case-licensing movement).

Consider the following contrast in binding possibilities:¹⁰

(22) *Intended*: 'Who are all the individuals *x*, such that *x*'s teacher hit *x*?'

- a. Wen_i hat **alles** sein_i Lehrer geschlagen?
who has ALL his teacher hit
- b. ??Wen_i hat sein_i Lehrer **alles** geschlagen?
who has his teacher ALL hit

The intended reading is one where the possessive pronoun inside the subject is interpreted as bound by the *wh*-phrase, such that the reference of the pronouns co-varies with the reference of the DP(s) that answer the question. The availability of the bound pronoun interpretation depends on the position of *alles*. In (22a), *alles* marks a scrambling position, above the subject; in (22b), *alles* marks one below the subject. Thus, *alles* above the subject is acceptable, but *alles* below the subject induces a Weak Crossover (WCO) violation. WCO (Postal 1971, Wasow 1979) is essentially the effect of degradation found for the bound-pronoun interpretation of sentences where the pronoun is not A-bound.

¹⁰ As usual, the relative degradedness of (22b) in comparison to (22a) is what is at stake here. While for me the bound-pronoun reading in (22b) is plainly not available, the absolute judgments that my consultants reported varied from – impressionistically – “both OK but (a) clearly better” or “(b) not completely out but worse than (a)” to “(a) OK, (b) not”; they were linguists familiar with the distinction, and tasked with judging the pair as either (i) both equally fine, (ii) both equally bad, (iii) one better, (iv) other better.

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Importantly, scrambling in German (and other languages) can obviate this effect (see Grewendorf 1988, Webelhuth 1992, Lee and Santorini 1994). Thus, (22a), where WCO is obviated, has the derivation in (23a) (Σ stands for scrambling): (i) [*wen alles*] scrambles above the subject; (ii) from there, [*wen alles*] A-binds the possessor, obviating WCO; (iii) *wen wh*-moves to Spec,C. *Alles* thus occurs in the same position as the *wh*-trace of *wen*.

- (23) a. [WH_i [*t_{wh}* **alles** [[SUBJECT *pro*_i NP] [*t_Σ*]]]]
 b. [WH_i [*t_{wh}* [[SUBJECT *pro*_i NP] [*t_Σ* **alles**]]]]

Correspondingly, were (22b) acceptable, it would need to have the same derivation as (22a) in (23a), differing only in the position of *alles*, as in (23b). However, given that (22b) is unacceptable, (23b) is not a possible derivation. In other words, *alles* cannot occur in the position corresponding to a scrambling trace. If this conclusion is correct, and *alles* must instead occur in the position of an \bar{A} -trace of its associate, we can begin to understand why (22b) is not acceptable: the conclusion leaves us, in essence, with three alternative derivations where the \bar{A} -trace requirement is satisfied while still stranding *alles* below the subject—(24a), (24b), and (24b'). All three derivations must fail.

- (24) a. [WH [SBJ [*t_{wh}* *alles*]]] ⇒WCO
 b. [WH [*t_{wh}* [*t_Σ* [SBJ [*t_{wh}* *alles*]]]]] ⇒IMPROPER MOVEMENT
 b'. [WH [*t_{wh}* [SBJ [*t_Σ* [*t_{wh}* *alles*]]]]] ⇒IMPROPER MOVEMENT

(24a) has the right kind of trace in the position of *alles*, but it is missing a step of scrambling that would obviate WCO. The sentence can therefore not have the intended interpretation. 24b/b' have the right kind of trace in the position where *alles* is pronounced, and there is a position reached by scrambling that c-commands the bound pronoun inside the subject, the position where the higher *t_{wh}* is. These derivations can therefore obviate WCO. However, (24b/b') must be blocked: In fact, both derivations interleave *wh*-movement and scrambling. If scrambling is A-movement, the derivations would constitute a case of Improper Movement, and would therefore prevent *alles* from appearing below the subject in a sentence like (22b).¹¹ If this conclusion is correct, then (this kind of) scrambling in fact *must* be A-movement, or else *alles* could be stranded below the subject while also not incurring a WCO violation.¹²

¹¹ It is in principle possible that the constituent [*wen alles*] (i) first scrambles above the subject, from where (ii) it binds the pronoun, followed by (iii) scrambling of the subject again over [*wen alles*]. WCO could then be obviated in the step preceding (iii). I see two options for the conclusion to still be warranted: (a) objects cannot scramble to a position that high (see some discussion in section 3.2), or (b) parses with this derivation are improbable to a degree that the contrast arises as a matter of likelihood of parses of the string.

¹² Note that based on this conclusion here, (object) scrambling can be seen to be A-movement more broadly given that “plain” scrambling outside of WCO configurations triggers the same anti-A-trace effect:

- (i) a. Wo hast du was₁ {**alles**} der Maria e₁ {**??alles**} gezeigt?
 where have.2SG you what.ACC ALL the.DAT Maria ALL shown
 ‘Where did you show what all to Maria?’

5. Conclusion

This paper argued that the distribution of the floating *wh*-quantifier *alles* in German is best characterized by the generalization in (5), with the additional restriction that *alles* cannot occur in the tail of A-movement. Together, the following generalization is claimed to hold: *Given a derivation, alles occurs in the position of any of its associate's \bar{A} -chain links.* To motivate the generalization, it was shown that *alles* can occur (a) in its associate's base position, (b) positions its associate can reach via scrambling, (c) positions its associate can reach via successive-cyclic *wh*-movement through vP , and (d) *not* in the tail of A-movement (object scrambling) needed for pronoun variable-binding.

As a consequence, it is argued that *alles* float is best explained by a stranding analysis where *alles* and its *wh*-associate are base-generated as a constituent, and *alles* is stranded by its associate via a procedure that involves movement. Inadequacies of analyses that assume that *alles* is not base-generated as a constituent with its associate are briefly discussed at each point.

Additional consequences are that (a) *alles* is diagnostic of \bar{A} -chain links of its associate, (b) *alles* provides evidence for successive-cyclic *wh*-movement through vP in German, and (c) at least object scrambling in German is necessarily A-movement.

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- b. Welcher Manager hat wen₁ {alles} heute e₁ {*alles} gefeuert?
 which.NOM manager have.3SG who.ACC ALL today ALL fired
 ‘Which manager fired who (all) today?’

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