

Wh-Quantifier Float in German is Stranding

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*This paper investigates the syntactic distribution of the German floating quantifier known as “invariant *alles*” (‘all’). The emerging generalization is that, given a derivation, *alles* occurs in any position occupied by an \bar{A} -chain link of the ‘associate’ of *alles*, i.e. the phrase *alles* “modifies”. The paper concludes that *alles* forms a deep constituent with its associate, and that therefore instances of floating *alles* are derived transformationally, specifically by some stranding procedure. Floating analyses and adverbial analyses of quantifier float are argued to be insufficient to explain the generalization. Three types of argument are presented to support the conclusion: (a) the distribution of *alles* is a subset of its associate’s; (b) *alles* blocks derivations when it occurs in a position from which its associate would also block the derivation; (c) *alles* is sensitive to the kind of movement that its associate undergoes—it can occur in tails of \bar{A} -movement but not in tails of *A*-movement. Further implications are that there is successive-cyclic *wh*-movement through (presumably) *vP* in German, that tails of *A*- and \bar{A} -movement can be distinguished by *alles*, and that object scrambling is necessarily *A*-movement in German.*

Keywords: quantifier float, stranding, successive-cyclicity, *A* vs \bar{A} , German

1 Introduction

German *wh*-questions can include an extra quantifier, known as “invariant *alles*” ‘all’:^{1,2}

- (1) [Wen **alles**]₁ hat der Peter *t*₁ eingeladen?
who.ACC all have.3SG the.NOM Peter invited

¹ Glosses follow Leipzig glossing conventions. Exceptions are: ALL = ‘*alles*’, MOD = ‘modal verb’, DPRT = ‘discourse particle’.

²Invariant *alles* (henceforth just ‘*alles*’) owes its name to its morphological invariance. Hence *alles* is to be contrasted with inflecting *all-* ‘all’, which will be largely ignored in this paper. See Reis (1992) for ample motivation to treat these two quantifiers as *prima-facie* independent phenomena (but see Merchant (1996) for the conclusion that the distribution of inflecting *all-* is to be derived from a stranding analysis, just as this paper will conclude for *alles*). For motivations to treat *alles* as *prima-facie* independent of another quantifier with the same form (*alles*) used in predicational contexts see Giusti (1991). Given these distinctions, I’d also like to point out some points of variation. These are initial results that have not been pursued more systematically; they also do not correlate with a specific analysis. The variation follows whether (a) floated *alles* is allowed with complex *wh*-associates such as *welch-NP* or *wem sein-NP* ‘whose NP’, (b) *überall* ‘everywhere’ is not preferred over floated *alles* with *wo* ‘where’ questions, (c) *alles* requires an exhaustive (rather than merely pluralizing) interpretation. When in doubt, this paper makes claims about the population for which (a–c) are true. Where there was no contrast with my own judgments, judgments of speakers for whom any (a–c) is false are included as well.

Two additional hallmarks of *alles* are that it is obligatorily de-stressed, and that it is restricted to occur in *wh*-questions, both non-echo and echo-questions; it appears to be marginally acceptable also in restrictive relatives when compared to appositive relatives; see Reis (1992).

‘Who all did Peter invite?’

Alles is a morphologically invariant, phonologically de-stressed quantifier that is interpreted along with an interrogative *wh*-phrase. Its contribution is an interpretation of the question such that a plurality of answers for I will refer to as the *associate wh*-phrase is presupposed, and an exhaustive answer is expected (*cf.* Reis, 1992; Beck and Rullmann, 1999).

The syntax of *alles* raises a series of questions, in particular its distribution. *Alles* is a floating quantifier, and occurs either right-adjacent to its associate *wh*-phrase, as in (1), or in positions at some distance from its associate *wh*-phrase, as in (2). This variation comes with no clear difference in meaning between (1) and (2), in the sense that the overall sentence-meaning contribution of *alles* remains constant.³

- (2) *Wen*₁ hat der Peter *t*₁ **alles** eingeladen?
who.ACC have.3SG the.NOM Peter all invited
‘Who all did Peter invite?’

This property is complicated by the fact that ‘floated’ (non-adjacent) *alles* can occur in a variety of positions (Pafel, 1991; Giusti, 1991; Reis, 1992; Zimmermann, 2007; Heck and Himmelreich, 2017)—one at a time, as indicated through the use of braces here and henceforth.

- (3) (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?’

This paper addresses the question of what the correct characterization of the distribution of floated *alles* is: does it have its very own distribution? or is its distribution reducible to the distribution of another syntactic object or category? There are mainly two syntactic analyses of *alles* in the literature. Reis (1992) concludes that *alles* is a ‘*wh*-clitic’, an expression that encliticizes to *wh*-words and *wh*-traces. Heck and Himmelreich (2017), on the other hand, propose that *alles* is an adverbial in a fixed *vP*-position that needs to be bound and licensed by a local *c*-commanding *wh*-phrase. This paper’s contribution is two-fold and is more consistent with Reis’s analysis than Heck and Himmelreich’s. First, this paper adds evidence to the descriptive generalization for the distribution of *alles* in (4) based on work by Pafel (1991) and in particular Reis (1992).

- (4) *Descriptive generalization for the distribution of floated alles:*
Floated *alles* occurs in a subset of the positions that its associate (*wh*-phrase) occurs in.

³There is clearly no change in meaning that depends on the position of *alles* in the sense that the meaning contribution of *alles* remains constant. To say that sentences that differ only in the position of *alles* are synonymous would be an overstatement, however. For instance, there are some differences in context-meaning between sentences with adjacent and floated *alles*. This contrast is likely epiphenomenal, however, given that the contexts in which *alles* is used right-adjacent *vs.* floated seems to largely co-vary with stress/focus on the associate *wh*-phrase. In addition, the position of floated *alles* can impact scope, as well as induce Beck-effects, where floated *alles* is unacceptable to the right of certain quantificational expressions, and in-situ *wh*-phrases are unacceptable to right of floated *alles* (Beck, 1996).

Second, based on this first-level descriptive generalization, and similar to Reis’s conclusion, the paper argues that the correct characterization of the distribution of *alles* is one that makes reference to the movement chain of the associate *wh*-phrase, specifically the associate’s \bar{A} -chain. The core proposition advanced in this paper is the generalization in (5).

(5) *Chain Link Generalization for floated alles (CLG):*

Given a derivation, *alles* occurs in any position occupied by an \bar{A} -chain link of its associate.

This understanding of *alles* as “living on a chain” has an immediate consequence for the analysis of *quantifier float*.⁴ The generalization in (5) essentially states that the distribution of floated *alles* is reducible to the distribution of (the \bar{A} -chain links of) its associate. This means that *alles* does not have a *sui generis* distribution, as might be expected by a *floating* analysis of quantifier float (Dougherty, 1970; Kayne, 1975), where there is a movement transformation that is specific to the quantifier. It also suggests, though does not entail, that the distribution of floated *alles* is not reducible to the distribution of another category that is not the associate of *alles*, for example a sentential adverb as would be expected by an *adverbial* analysis of quantifier float (Dowty and Brodie, 1984; Bobaljik, 1995; Koopman, 2010; Heck and Himmelreich, 2017). Instead, if the CLG is correct, the best way to operationalize the conclusion that *alles* lives on \bar{A} -chains is to follow a *stranding* analysis of quantifier float (Sportiche, 1988; Miyagawa, 1989; Shlonsky, 1991; McCloskey, 2000). In such an approach, *alles* is first-merged in a constituent that includes the associate – idealizing, a structure like (6) –, specifically the first-merge instance of its associate, the trivial instance of the associate’s chain in the sense of (Chomsky, 1981, 1995).

(6) [DP WH *alles*]

This paper thus proposes that floated *alles* is derived from a shared constituent with its associate through some stranding procedure, while remaining agnostic as to whether stranding is to be understood as sub-extraction of the associate or full movement followed by partial deletion of copies. While other analyses of the distribution of floated *alles* may be successful in accounting for the distribution, it should be easy to see that the distribution, as characterized in the CLG, can only be *explained* by a stranding analysis. If floated *alles* originates in one constituent with its associate, the fact that they appear in the same positions follows immediately. In a strictly cyclic model of syntax, where *alles* cannot be added to the structure late, *some* stranding analysis of *alles* where floated and adjacent *alles* have the same source is therefore argued to follow as a corollary of the conclusion that *alles* lives on its associate’s \bar{A} -chain.

In fact, this paper contends that an analysis of floated *alles* based on a shared constituent like the one in (6) is not only *possible*, but *necessary*. While alternative analyses that assign a separate source to floated *alles* (*viz* an adverbial one) may be able to cover the distribution of *alles* one way or another, they will remain largely inadequate in explaining the asymmetries that motivate the CLG in (5). The paper can thus overall be seen as an argument that a stranding analysis of quantifier float must be made available by Universal Grammar (UG). Against the background of previous work arguing in favor of the necessity of a stranding analysis of quantifier float (see also Merchant, 1996 on

⁴ For a review of theories of quantifier float see Bobaljik (2003).

inflecting *all-* in German, Henry, 2012 on West Ulster English, and Fitzpatrick, 2006 on Russian, Japanese and Korean), this paper raises the possibility that a stranding analysis may in fact be the sole analysis made available by UG (*cf.* Henry, 2012), thereby finessing the question of how the learner would decide between the alternatives given some input.

Finally, three broader consequences arise from the facts making up the CLG in (5).

1. there is successive-cyclic movement through a clause-medial position in German, presumably ν P (section 2.3);
2. stranded *alles* is diagnostic of tails of \bar{A} -movement (section 4);
3. (object) scrambling in German is A-movement (section 4).

The paper is structured as follows: section 2 establishes the facts of the first part of the CLG—that the distribution of *alles* is to be equated with the distribution of its associate’s chain; section 3 reinforces that conclusion by showing two cases where floated *alles* induces effects that are otherwise induced only by the overt presence of the associate. Section 4 establishes the second part of the CLG, the restriction to \bar{A} -chain links, by showing that floated *alles* is subject to an anti-A-trace effect. Section 5 discusses and concludes.

2 *Alles* Lives on Chains Part 1: *Alles* Distributes Like Chain Links

If the CLG in (5) is true, we expect the distribution of *alles* to be predictable from the distribution of its *wh*-associate. Assuming the simple derivations of the *wh*-phrases in (7), we expect *alles* to be available in each tail of *wh*-movement:⁵ in the base position, and in the landing site of optional scrambling.⁶

- (7) a. $[_{CP} \text{ WH-ACC}_1 \{ \text{alles} \} [_{C'} \text{ C+V } [_{TP} \text{ DP-NOM} \dots (e_1) \{ \text{alles} \} \dots [_{VP} e_1 \{ \text{alles} \}]]]]]]$
 b. $[_{CP} \text{ WH-NOM}_1 \{ \text{alles} \} [_{C'} \text{ C+V } [_{TP} (e_1) \{ \text{alles} \} \dots e_1 \{ \text{alles} \} \dots [_{VP} \text{ DP-ACC}]]]]]]$

In addition, if *wh*-movement proceeds in small successive-cyclic steps, we expect *alles* to be available in intermediate positions of long *wh*-movement. *Alles* is expected not to be available in other positions. By establishing these facts, the following sections consolidate and extend the generalization put forth by Reis (1992) (which she attributes to Pafel, 1991), that invariant *alles* is found right-adjacent to its associate, in the associate’s base positions, and in positions its associate can reach via scrambling.⁷

⁵ A fairly standard analysis of *wh*-movement will be assumed throughout the paper, following the core insights from Chomsky (1973, 1977, 1981); Lasnik and Saito (1992): interrogative *wh*-phrases move into the domain of a correspondingly interrogative C [COMP], obeying whatever constraints on movement give rise to island effects, subjacency effects, superiority effects and so forth.

⁶ A caveat is in place. It only follows from the CLG that *alles* can be found in the base position of its associate if the associate can directly \bar{A} -move from the base position. If, instead, there is obligatory A-movement from the base position, preceding any eventual \bar{A} -movement to Spec,C, then *alles* is not expected to be available in the θ -position of its associate. See section 4.3.

⁷ Reis (1992: 486) notes two exceptions to this generalization: “(a) in the position immediately adjacent to the Wackernagel position; (b) in the position immediately preceding the non-scrambling

2.1 Base position

Two properties of German syntax make identifying the base position of arguments particularly challenging. On the one hand, German is a free word order language. I follow the general assumption that there is a rule of *scrambling* underlying free word order (*cf.* Ross, 1967), and, in particular, that scrambling is to be construed as movement to a clause-medial position outside the VP.⁸ In a standard example like (8), the ACC object *den Kuchen* can scramble over the DAT object.

- (8) a. [_{CP} Gestern [_{C'} hat [_{TP} sie der Regina den Kuchen
yesterday have.3SG she.NOM the.DAT Regina the.ACC cake
weggenommen]]]
taken.away
- b. [_{CP} Gestern [_{C'} hat [_{TP} sie₂ ... [_{DP} den Kuchen]₁ [_{VP} e₂
yesterday have.3SG she.NOM the.ACC cake
[_{VP} der Regina e₁ weggenommen]]]]]
the.DAT Regina take.away.3SG
'Yesterday, she took away the cake from Regina'

On the other hand, the position of the verb is not a useful landmark in fixing the position of the object. German is a verb final language with verb-second (V2) in finite matrix clauses—following a standard analysis, through V to C movement. Finding *alles* in positions below a subject, an object, or certain adverbs is therefore not reliable evidence for *alles* occurring in its associate's base position. It may well be that *alles* is occurring in a position higher than the base position, but still lower than the position reached by other elements via scrambling. For the task of individuating the position of a given instance of *alles*, this means that configurations that limit the amount of movement must be used to infer positions in the clause. I provide two diagnostic configurations that plausibly allow us to infer the base position of the object, and that therefore, insofar as these diagnostics are convincing, allow us to determine that *alles* can occur in the base position of its associate. The two diagnostics are based on: (i) the position of *wh*-indefinites, which have very limited movement options, (ii) the position of certain focused adverbs, which mark the left edge of the focused VP (or *vP*).

elements in the rightmost position(s) of the middle field". She dismisses them by observing that they all seem to be connected to the 'clitic property' that *alles* has in common with modal particles. It seems that an additional process is affecting *alles* and modal particles alike. Another, less construction specific way to understand the effects is to say that some (limited) amount of reshuffling of prosodic units is possible at PF to accommodate de-accented material more broadly.

⁸ Within the work on German that assumes that scrambling is movement, scrambling is traditionally adjunction to a maximal verbal projection. In more modern terms, scrambling is movement to a specifier of a clause-medial projection, *vP* or TP; possibly, both projections are viable targets, with different interpretations associated with each, as *e.g.* proposed in Heck and Himmelreich (2017). Scrambling has been classified as either A-movement (*e.g.* Haider and Rosengren, 1998; Frey, 2006), \bar{A} -movement (*e.g.* Grewendorf and Sabel, 1999; Grewendorf, 2005), or as a third type altogether sharing properties of both (Webelhuth, 1992; see also Tada, 1993). "Short" scrambling, which does not cross finite CPs and is the only scrambling available in German, creates new A-binding possibilities.

2.1.1 *Wh*-Indefinites

The movement options of *wh*-indefinites in German are very limited.⁹ Most importantly, Haider (1993: 200, fn2) notes that *wh*-indefinites cannot scramble.¹⁰ As such, in the general case, they mark their base position. Consider a ditransitive verb such as *zeigen* ‘show’, which has the underlying object structure DAT>ACC.¹¹ The word order facts

⁹ For instance, *wh*-indefinites cannot occur in Spec,C, as in (i), and subject *wh*-indefinites cannot occur to the left of weak object pronouns, as regular subjects can, *cf.* (ii).

- (i) *Wen habe ich gesehen.
 who.ACC have.1SG I.NOM seen
Intended: ‘I saw someone.’
- (ii) dass {Peter/*wer} ihn dir {Peter/wer} gestern vorgestellt hat
 that Peter/who.NOM him.ACC you.DAT Peter/who.NOM yesterday introduced have.3SG
 ‘that Peter/someone introduced him to you yesterday’

It would be too strong to say that *wh*-indefinites cannot move at all. Depending on one’s analysis of the following phenomena, *wh*-indefinites can be the derived subject of a passive to the left of the *by*-phrase, ((iia)), the subject of a raising verb ((iib)), and the subject of a non-agentive modal verb ((iic)).

- (iii) a. dass wer vom Peter beleidigt wurde
 that who.NOM by.the Peter insulted be.3SG
 ‘that someone got insulted by Peter’
- b. dass was anzubrennen droht
 that what.NOM to.burn.at threaten.3SG
 ‘that something threatens to get burnt’
- c. dass da wer verunglückt sein soll
 that there who.NOM have.accident be should.3SG
 ‘that someone supposedly got into an accident/died there’

¹⁰ That *wh*-indefinites cannot scramble at all is clearly an overreach, possibly due to the fact that “Scrambling” is a label attributed to a variety of clause-medial movements. My impression is that *wh*-indefinites are able to move, but not as high as regular DPs, and that whenever they move they are interpreted as specific. For the base position facts it is thus important to consider the non-specific interpretation of the *wh*-indefinites to be sure.

For instance, consider the following two notable exceptions to Haider’s generalization. For one, *wh*-indefinites can occur on either side of negation, with a preference for occurring to the left, as shown in (ia). (Nonetheless, they cannot occur to the left of *keiner* ‘no-one’, which regular DPs can scramble over, *cf.* (ib).) *Wem* to the left of negation must be interpreted as specific, *i.e.* taking surface scope over negation; *nicht wem* on the other hand means that no-one was helped.

- (i) a. dass du {wem} nicht {?wem} geholfen hast
 that you.NOM who.DAT not who.DAT helped have.3SG
 ‘that you didn’t help someone’
- b. dass {*wem} keiner {wem} geholfen hat
 that who.DAT no-one.NOM who.DAT helped have.3SG
 ‘that no-one help someone’

Secondly, with some ditransitive verbs both object orders are at least marginally possible with two *wh*-indefinite objects. As far as I can tell, in these cases the prosody is marked, and the *wh*-indefinite on the left again receives an obligatorily specific interpretation. Such verbs are excluded in this section.

¹¹ Underlying precedence, and precedence of constituents in the so-called *middle field*, *i.e.* the edges of TP and vP, generally map to c-command. Unless otherwise noted, ‘>’ can thus be taken to stand for

in (9) reflect the asymmetry of objects with *zeigen*.¹² In (9a), the DAT *wh*-indefinite successfully precedes the ACC indefinite; in (9b), the inverse word order fails. In (9c), the DAT indefinite successfully precedes the ACC *wh*-indefinite; in (9d), the opposite word order fails. In other words, *wh*-indefinites respect Lenerz' Generalization (Lenerz, 1977), which states that for verbs like *zeigen*, the ACC may only scramble to the left of the DAT when the ACC object is definite.

- (9) a. dass 'n Lehrer wem 'ne neue Übung gezeigt hat
 that a.NOM teacher who.DAT a.ACC new exercise shown have.3SG
 'that a teacher showed a new exercise to someone'
- b. *dass 'n Lehrer 'ne neue Übung wem gezeigt hat
 that a.NOM teacher a.ACC new exercise who.DAT shown have.3SG
- c. dass 'n Lehrer 'nem Schüler was gezeigt hat
 that a.NOM teacher a.DAT student what.ACC shown have.3SG
 'that a teacher showed something to a student'
- d. *dass 'n Lehrer was 'nem Schüler gezeigt hat
 that a.NOM teacher what.ACC a.DAT student shown have.3SG

Scrambling is known to impact the background-focus properties. To control for this factor and avoid undesired movement, the sentences should be understood as occurring in an *all-new* discourse context, for example against a question like *Was is passiert?* 'What happened?'. Alternatively, they can be understood as a full contrast, for example against a prior statement like *dass 'n Schüler niemand 'nen alten Stift geschenkt hat* 'that a student gave no-one an old pencil as a gift'. In these contexts, at least the subject and the VP are focused (*i.e.* F-marked, and not Given, in the sense of Schwarzschild (1999)). The subject gets falling intonation on its internal main stress (*'n LEHrer*), while the main stress of the VP falls on the XP left-adjacent to V if there is one (*wem 'ne neue ÜBUNG gezeigt*), also with falling intonation; the stress internal to the VP is further the strongest in the sentence because it is the rightmost focused constituent, indicated through underlining.¹³

both precedence and c-command in this paper. For example, a negative quantifier can bind a pronoun from the DAT into the ACC, but not vice-versa (read 'show' as showing on a photo, for instance):

- (i) a. dass 'n Lehrer [keinem neuen Schüler]_i seine_i Mitschüler gezeigt hat
 that a.NOM teacher no.DAT new student his.ACC peers shown have.3SG
 'that a teacher showed no new student their peers'
- b. *dass 'n Lehrer seinen_i Mitschülern [keinen neuen Schüler]_i gezeigt hat
 that a.NOM teacher his.DAT.PL peers no.ACC new student shown have.3SG

¹² The indefinites are presented in a contracted form (that is natural to my variety) in these paradigms to facilitate prosodic considerations.

¹³ The falling intonations that naturally arise in all-new contexts and with full contrasts are important as rising intonation contrasts – which includes so-called “hat-contours”, which are discontinuous intonations with rising intonation on one constituent and falling intonation on a later one, – appear to greatly change word order options in German to the point where they put out of effect known word order generalizations such as Lenerz' generalization. Specifically pertaining to (9), the order ACC>DAT in (9b) is acceptable if the verb is contrastively focused (*geZEIGT*) with a rising intonation. The sentence would have the interpretation that the showing contrasts with some other event, for instance a taking away (*... was wem nur geZEIGT, aber nicht WEGgenommen hat*), but it is not the contrast that matters, but rather the rising intonation. The utterance *... was wem geZEIGT* 'ACC DAT showed' with falling intonation cannot be used to form an acceptable contrast with an utterance like *... wem was weggenommen* 'DAT ACC taken away'. Similarly, rising contrastive focus on *'nem SCHÜler* 'a student' greatly ameliorates (9d).

It is important to note at this juncture that the de-accented nature of *wh*-indefinites may seem to create a problem with stress assignment. So in order to argue that these effects are syntactic, it must be established that the contrasts in (9) cannot be explained by referring to prosodic properties alone. At first, it seems that the contrast between (9a-b) could be explained by the de-accented property of *wh*-indefinites. When both objects are definite, and the sentences are acceptable, the nuclear stress of the focused VP falls on ACC when it is not scrambled, *cf.* (10a), and on DAT when ACC is scrambled out, *cf.* (10b).

- (10) a. dass 'n Lehrer dem Burschen die neue ÜBUNG gezeigt
 that a.NOM teacher the.DAT lad the.ACC new exercise shown
 hat
 have.3SG
 ‘that a teacher showed the new exercise to the lad’
 b. dass 'n Lehrer die neue Übung dem BURschen gezeigt
 that a.NOM teacher the.ACC new exercise the.DAT lad shown
 hat
 have.3SG

In (9a), the nuclear stress rule in German would assign stress to ACC (*wem 'ne neue ÜBUNG gezeigt*). In (9b), the ACC is out of the way, so the DAT needs to bear the VPs stress. If the DAT *wh*-indefinite were not able to bear this stress, and there was no alternatives to satisfy the focus-accent interface conditions, then the unacceptability of (9b) would be explained. However, the same explanation cannot be extended to (9c), where the ACC *wh*-indefinite is left-adjacent to V. (9c) is acceptable, and in fact it shows us that there is an alternative way of satisfying the focus-accent conditions for the VP when necessary: the *wh*-indefinite is still de-accented, but it is the verb that now bears (falling intonation) stress (*'n LEHrer 'nem SCHÜler was geZEIGT hat*). Similarly, it is unclear why (9d) should be unacceptable if the contrasts in (9) were to be explained by prosodic properties of *wh*-indefinites.¹⁴

If instead we assume that all the examples in (10) indeed reflect base positions, *i.e.* do not involve any scrambling, we can understand why (9a) and (9c) are acceptable word orders, but (9b) and (9d) are not: the acceptable sentences reflect a licit base structure for *zeigen* (DAT>ACC), while the unacceptable sentences reflect an ungrammatical base structure for *zeigen* (ACC>DAT). Indeed the same facts hold with two *wh*-indefinites, *cf.* (11a)–(11b). (If acceptable at all, the ACC object in the non-canonical order in (11b) must be interpreted as specific; see footnote 10.)

- (11) a. dass 'n Lehrer wem was gezeigt hat
 that a.NOM teacher who.DAT what.ACC shown have.3SG
 ‘that a teacher showed something to someone’
 b. ??dass 'n Lehrer was wem gezeigt hat
 that a.NOM teacher what.ACC who.DAT shown have.3SG

Crucially, it is possible to scramble a definite (and sometimes indefinite) full DP to a

As a general rationale, in order to guarantee that minimal pairs are matched for prosody and movement options, I make every effort to exclude sentences with such prosody in this paper.

¹⁴ Of course, it remains to be seen whether some other prosodic explanation can be offered to account for the contrasts. I leave this to the reader, and assume instead that the effect is not prosodic.

higher position. (12) is exactly what wasn't possible in (11) and (9). If *wh*-indefinites cannot scramble and rather have to stay in their base position, the word order facts fall out directly from the underlying order of objects of *zeigen*.

- (12) dass 'n Lehrer die neue Übung wem gezeigt hat
 that a.NOM teacher the.ACC new exercise who.DAT shown have.3SG
 'that a teacher showed the new exercise to someone'

Finally, without rising intonations, it is not possible to scramble a *wh*-indefinite DAT over a subject, while this is possible for regular indefinite DAT objects; *cf.* the sentences in (13). (With a hat-contour rising on the subject *keiner/'n Lehrer* and falling on the object *'n Buch* both sentences are perfect; the *wh*-indefinite must also be interpreted as specific in that case, see footnote 10.)

- (13) a. ??dass wem keiner /n' Lehrer 'n Buch gezeigt hat
 that who.DAT noone.NOM a.NOM teacher a.ACC book shown have.3SG
Intended: 'that no-one/a teacher showed a book to someone'
 b. dass 'nem Burschen keiner /n' Lehrer 'n Buch gezeigt
 that a.DAT lad noone.NOM a.NOM teacher a.ACC book shown
 hat.
 have.3SG
 'that no-one/a teacher showed a book to a lad'

In sum, finding an expression between a (non-specific¹⁵) DAT *wh*-indefinite and the verb *zeigen* is evidence that this expression occupies a position in the thematic nucleus of the VP, the ACC argument's base position. When this test is applied to a *wh*-question with *alles* we see that *alles* associated with the ACC object is acceptable, see (14Q).¹⁶

- (14) Q: Weißt du, [CP was der Lehrer [VP wem **alles** gezeigt]
 know.2SG you what.ACC the.NOM teacher who.DAT ALL shown
 haben soll]?
 have MOD.3SG
 'Do you know what all the teacher supposedly showed to someone?'
 A: Ne, nur, dass er wem 'ne neue Übung gezeigt haben soll.
 no only that he who.DAT a.ACC new exercise shown have MOD.3SG
 'No, just that he supposedly showed someone a new exercise.'

As expected by the CLG in (5), this means that *alles* can occur in the base position of its associate.

¹⁵ On way to confirm the non-specificity is to see if a plural expression can be used in the answer to refer back to the *wh*-indefinite. It seems to me that when the *wh*-indefinite is specific it is either necessarily atomic in reference or very strongly preferred to be interpreted that way. The non-specificity of the DAT *wh*-indefinite in the question in (14Q) can thus be confirmed by the fact that the DAT *wh*-indefinite in the answer in (14A) can be substituted with the plural expression *einigen Schülern* 'to some students'.

¹⁶ To avoid a multiple question reading, it is necessary to respect the de-accented nature of the *wh*-indefinite. Parallel to the discussion for (9c), the most natural prosody for me is one with focus on the main verb (*geZEIGT*) in line with the de-accented nature of *alles*.)

2.1.2 Focused Adverbs

The next diagnostic involves focused adverbs.¹⁷ Focused adverbs do not scramble.¹⁸ As a consequence, VP-level adverbs mark the left edge of the focused VP when they are focused.¹⁹ If *alles* can occur in its associate's base position in accord with the CLG in (5), then we expect that *alles* can occur to the right of the focused adverb whenever the base position of the associate is inside the VP. This is what we find. Consider the sentences in (15) with the manner adverb *gerne* 'with pleasure'. (To get the right focus structure, one can understand the sentences as answers to the question *Was weißt du über die Susi?* 'What do you know of/about Susi?'—ignoring the fact that they are perhaps unusually specific answers to such a generic question, so that the content following the focused adverb is accommodated as common ground.)

- (15) Ich weiß zum Beispiel,
I know for instance
- a. *wem* sie GERne **alles** ein Geschenk mitbringen würde.
who.DAT she.NOM gladly ALL a.ACC present bring.with would.3SG
'I know, for instance, who all she would bring a present with pleasure.'
- a'. ?*wem* seinen Kindern sie GERne **alles** ein Geschenk
who.DAT his.DAT.PL children.DAT she.NOM gladly ALL a.ACC present
mitbringen würde.
bring.with would.3SG
'I know, for instance, whose all children she would bring a present with pleasure.'
- b. *was* sie GERne einem Kind **alles** mitbringen würde.
who.ACC she.NOM gladly a.DAT child ALL bring.with would.3SG
'I know, for instance, what all she would bring a child with pleasure.'
- b'. ?*wem* seine Spielsachen sie GERne einem Kind **alles**
who.DAT his.ACC.PL toys she.NOM gladly a.DAT child ALL
mitbringen würde.
bring.with would.3SG
'I know, for instance, whose all toys she would bring a child with pleasure.'

As a test case, consider again Lenerz' generalization (Lenerz, 1977), which states that direct objects of ditransitive verbs may only scramble when definite. This generalization captures the word order facts in (16), where the definite ACC object may scramble over the DAT object (in a DAT>ACC verb) only when it is definite ((16b) vs. (16d)).

¹⁷ Focus here is again to be understood in a way that excludes *rising intonation* contrastive focus.

¹⁸ For instance, Reis (1992: fn18) points to Lenerz (1977), von Stechow and Sternefeld (1988: 466), Grewendorf and Sternefeld (1990: 15), Fanselow (1990: 115ff).

¹⁹ 'VP' is the label from pre-vP literature. The adverb(s) can be taken to mark vP, which makes also more sense semantically. When the associate is the subject, while the *alles* below *gerne* is not perfect in comparison to *alles* above *gerne*, it is much better than *alles* below ACC.

- (i) Ich weiß zum Beispiel, *wer* ihr {**alles**} GERne {?**alles**} ein Geschenk
I know.1SG for example who.NOM her.DAT ALL gladly ALL a.ACC present
{***alles**} mitbringen würde.
ALL bring.with would.3SG
'I know, for instance, who all would bring her a present with pleasure.'

- (16) a. Die Susi hat dem Kind das Geschenk mitgebracht.
 the.NOM Susi have.3SG the.DAT child the.ACC present brought.with
 ‘Susi brought the child the present.’
 b. Die Susi hat das Geschenk dem Kind mitgebracht.
 the.NOM Susi have.3SG the.ACC present the.DAT child brought.with
 c. Die Susi hat dem Kind ein Geschenk mitgebracht.
 the.NOM Susi have.3SG the.DAT child a.ACC present brought.with
 ‘Susi brought the child a present.’
 d. *Die Susi hat ein Geschenk dem Kind mitgebracht.
 the.NOM Susi have.3SG a.ACC present the.DAT child brought.with

If we add in a focused adverb, *e.g.* again *gerne* ‘with pleasure’, we see that it may occur in positions preceding a string that is compatible with the canonical order DAT>ACC, but not in positions preceding a string that is not compatible with the canonical order. Focused *gerne* is thus impossible in front of the ACC object in the derived position in (17b). The prosody falls homogeneously from the focused adverb on to the rest of the VP. (Schematics are included below each sentence for expository purposes.)

- (17) a. Die Susi hat {GERne} dem Kind {GERne} das
 the.NOM Susi have.3SG gladly the.DAT child the.ACC
 Geschenk {GERne} mitgebracht.
 present brought.with
 ‘Susi brought the child the present with pleasure.’
 [{ADV} DAT {ADV} ACC {ADV} V]
 b. Die Susi hat {*GERne} das Geschenk {GERne} dem
 the.NOM Susi have.3SG gladly the.ACC present the.DAT
 Kind {GERne} mitgebracht.
 child brought.with
 ‘Susi brought the child the present with pleasure.’
 [{*ADV} ACC {ADV} DAT {ADV} V]

In addition, we see in (18) that when the (lower) ACC object is indefinite, the string where the focused adverb is preceded by the indefinite ACC object is illicit. The unacceptability of that string is in keeping with Lenerz’ generalization, that the ACC object cannot scramble when it is indefinite, if we understand focused *gerne* as occupying a position just below any target of scrambling.

- (18) Die Susi hat {GERne} dem Kind {GERne} ein
 the.NOM Susi have.3SG gladly the.DAT child a.ACC
 Geschenk {*GERne} mitgebracht.
 present brought.with
 ‘Susi brought the child a present with pleasure.’
 [{ADV} DAT {ADV} ACC-INDEF {*ADV} V]

Generalizing, scrambling targets positions that are higher than the projection that minimally includes the focused adverb.²⁰ (15) thus constitutes evidence that *alles* can

²⁰ The *wh*-indefinite test and the focused adverb test can be combined to check one against the other. Indeed, a *wh*-indefinite may not occur to the left of a focused adverb as shown in (i). (The low position of the adverb in (i) is acceptable with rising contrastive focus – a hat-contour rising on *gerne* and falling on *Geschenk* – or with main stress on ACC *wem gerne ein GESCHENK mitgebracht.*)

occur in the base position of its associate as the CLG in (5) would predict. The facts are schematized in (19).

- (19) a. [CP WH.DAT₁ ... [VP/vP GERne [VP e₁ *alles* [VP INDF.ACC V]]]]
 b. [CP WH.ACC₁ ... [VP/vP GERne [VP INDF.DAT [VP e₁ *alles* V]]]]

Given the generalization in (5), that *alles* lives on its associate's chain, we also expect the converse not to be possible: we expect a non-canonical word order between *alles* and the non-*wh* object to be impossible when they occur in the base positions below the focused adverb. The mirror images of (15a)–(15b) in (20) are unacceptable as, in a way, *alles* “occurs in the wrong base position”.²¹

- (20) Ich weiß zum Beispiel,
 I know.1SG for example
 a. **wem* die Susi GERne ein Geschenk **alles** mitbringen
 who.DAT the.NOM Susi gladly a.ACC present ALL bring.with
 würde.
 would.3SG
 ‘I know, for instance, who all Susi would bring a present with pleasure.’
 b. ?**was* die Susi GERne **alles** einem Kind mitbringen würde.
 who.ACC the.NOM Susi gladly ALL a.DAT child bring.with would.3SG
 ‘I know, for instance, what all Susi would bring a child with pleasure.’

2.2 Scrambling positions

In keeping with the CLG in (5), *alles* can also occur in positions that its associate can reach via scrambling. For instance, consider (21). As discussed above, focused adverbs mark the left edge of focused VPs/vPs, and scrambling minimally targets positions higher than focused adverbs. Since *alles* can occur to the left of these focused adverbs, (21) indicates that *alles* can occur in a position that its associate reached via scrambling.

- (21) Ich weiß nicht,
 I don't know
 a. *wem*₁ die Susi **alles** GERne e₁ ein Geschenk mitbringen
 who.DAT the.NOM Susi ALL gladly a.ACC present bring.with
 würde.
 would.3SG
 ‘I don't know who all Susi would bring a present with pleasure.’
 b. *was*₁ die Susi **alles** GERne einem Kind e₁ mitbringen würde.
 who.ACC the.NOM Susi ALL gladly a.DAT child bring.with would.3SG
 ‘I don't know what all Susi would bring a child with pleasure.’

-
- (i) Ich weiß zum Beispiel, dass sie {GERne} *wem* {??GERne} ein Geschenk
 I know for example that she.NOM gladly who.DAT gladly a.ACC present
 mitgebracht hat.
 brought.with have.3SG
 ‘I know, for instance, that she brought someone a present with pleasure.’

²¹ Patterns like (20a) are analyzed as intervention effects by Heck and Himmelreich (2017). While Heck and Himmelreich argue that such facts are part of a larger pattern, it seems that there is an alternative explanation for at least some of the facts.

Importantly, an overt *wh*-phrase can also occupy this position. German is a language that fronts a single *wh*-phrase, like English; the remaining *wh*-phrases of a multiple-*wh* question remain in-situ. The examples in (22) show that the “in-situ” *wh*-phrase of multiple *wh*-questions can scramble, given that the *wh*-phrase may occur either to the left or the right of the focused adverb.

- (22) a. Wer würde GERne *wem* ein Geschenk mitbringen?
 who.NOM would.3SG gladly who.DAT a.ACC present bring.with
 ‘Who would like to bring whom a present?’
 b. Wer würde *wem*₁ GERne *e*₁ ein Geschenk mitbringen?
 who.NOM would.3SG who.DAT gladly a.ACC present bring.with

There are two more facts that show that *alles* can occupy scrambling positions (that is positions its associate may scramble to). First, consider where *alles* can occur relative to the DAT object of verbs like *zeigen* ‘show’ which are underlyingly DAT>ACC (see again section 2.1.1; footnote 11). The sentence in (23a) shows that *alles* associated with the ACC object *was* can occur on either side of the DAT object *der Bevölkerung*.

- (23) a. *Was* hat die Demonstrantin {**alles**} der Bevölkerung
 what.ACC have.3SG the.NOM protester ALL the.DAT population
 {**alles**} gezeigt?
 ALL shown
 ‘What (all) did the woman protester show the population?’
 b. Wer hat {*was* (alles)} der Bevölkerung {*was*
 who.NOM have.3SG what.ACC ALL the.DAT population what.ACC
 (**alles**)} gezeigt?
 ALL shown
 ‘Who showed the population what (all)?’

Given that the underlying order of objects for *zeigen* is DAT>ACC, when *alles* is to the left of the DAT object it is occupying a derived position—in this case a scrambling position. In fact, the same position may be filled, with or without *alles*, by the associate *wh*-phrase itself, *cf.* (23b).

Next, consider the behavior of weak object pronouns. Weak pronouns in German are de-stressed, and, depending on dialect may be reduced to various degrees. They occupy what is traditionally referred to as the *Wackernagel position*, which is either the leftmost edge of *vP*, or some specifier of *TP* (see for example Müller, 2001; Anagnostopoulou, 2008, and references therein). Weak object pronouns are interesting because there is an asymmetry connected with them. Non-pronominal subjects can occur on either side of them, as can be seen in example (24a), but non-pronominal objects can only occur to their right, so that *den Apfel* ‘the apple’ in example (24b) is unacceptable to the left of *ihm* ‘him’ (without “hat-contour”; with contour rising on *Apfel* and falling on *keiner* (24b) is acceptable).

- (24) a. dass {Maria} ihm {Maria} gerne was abgegeben
 that Maria him.DAT Maria gladly what.ACC give.away
 hätte.
 have.COND.3SG
 ‘that Maria would have gladly given him something.’

- b. dass {*den Apfel} ihm {den Apfel} keiner e abgegeben
 that the.ACC apple him.DAT the.ACC apple noone.NOM give.away
 hätte.
 have.COND.3SG
 ‘that Maria would have given him the apple.’
- c. Wann/wo {*was} ihm {was} keiner e abgegeben
 when/where what.ACC him.DAT what.ACC noone.NOM give.away
 hätte, ist unklar.
 have.COND.3SG be.3SG unclear
 ‘It is unclear when/where no-one would have given him what.’

A *wh*-phrase object behaves in the same way as a non-pronominal object. This is shown in the multiple question in (24c). Once again these facts hold for intonations that exclude the contrastive focus hat-contour, for instance one that rises on ACC and falls on NOM.

Alles associated with an object *wh*-phrase behaves just like non-pronominal objects, and like the object *wh*-phrase itself. The sentences in (25) show that *alles* can occur to the right of weak object pronouns, here *sich* ‘3.self’ in (25a), and *ihm* ‘3.DAT’ in (25b), but it cannot occur to their left.

- (25) a. *Wen* soll man {?*alles} sich {alles} dabei vorstellen?
 who.ACC MOD.3SG one.NOM ALL REFL ALL that.by imagined
 ‘Who all is one supposed to think of based on that?’
- b. *Was* hat {?*alles} ihm {alles} keiner e geben
 what.ACC have.3SG ALL him.DAT ALL noone.NOM give
 wollen?
 want
 ‘What all did no-one want to give him?’

Thus, as the CLG in (5) predicts, *alles* can appear in positions its associate can scramble to and cannot appear in positions its associate cannot scramble to. To complete the picture, one would expect based on the asymmetry between subjects and objects that subject-*alles* can occur both to the right and to the left of a weak object pronoun. The facts are less clear here. On the one hand, it seems that *alles* to the left of *sich* ‘self’ is rather marginal but perhaps not impossible, see (26b).²² much worse than when to the right of *sich*, cf. (26a). If we follow the guiding principle that what counts is the relative judgment, then the contrast tells us that it is *not* possible for *alles* to occur to the left of the weak pronoun. In fact, the availability decreases with a complex *wh*-phrase associate, cf. (26d), and weak objects other than *sich* (e.g. *mich/dich/sie/ihn* ‘me/you.SG/her/him’) seem to fully resist *alles* to their left—the test sentences substitute these pronouns for *sich*, and delete *selbst*).

- (26) a. *Wer* möchte sich e alles BITTE NOCH selbst anzeigen?
 who.NOM want.3SG REFL ALL please still self lay.charge.against
 ‘Who all wants to lay charges against themselves?’
- b. ??*Wer* möchte alles sich e BITTE NOCH selbst anzeigen?
 who.NOM want.3SG ALL REFL please still self lay.charge.against

²² A focused element separates *sich* and *selbst* to ensure that the falling prosody of the focused VP starts after *sich* so that *sich* is an unfocused weak pronoun. Thanks to Julian Schlöder for noticing that the modal particles *bitte* and *noch* slightly ameliorate judgments (for obscure reasons).

- c. *Wem seine Mandanten* möchten sich *e alles* NOCH selbst
 who.DAT his.PL clients want.3PL REFL ALL still self
 anzeigen?
 lay.charge.against
 ‘Whose clients all want to lay charges against themselves?’
- d. ?**Wem seine Mandanten* möchten **alles** sich *e* NOCH selbst
 who.DAT his.PL clients want.3PL ALL REFL still self
 anzeigen?
 lay.charge.against

It might seem, then, that in fact not all positions that can be reached via scrambling are possible positions for floated *alles* because regular subject *are* able to appear to the left of weak object pronouns. However, this asymmetry is just apparent because a *wh*-phrase subject is also marginal when to the left of a weak object, cf. (27).²³ This contrast lends support to the idea that something special is going on with subject scrambling, and, more importantly, *that the distribution of floated alles is correlated with the distribution of its associate* as the CLG in (5) predicts.²⁴

- (27) Wann (genau) {??/?*wer} ihm_i {wer} gestern seine_i Medizin
 when exactly who.NOM him.DAT who.NOM yesterday his.ACC medicine
 geben sollte, war unklar.
 give should.PST.3SG be.PST.3SG unclear
 ‘It was unclear who was to give him his medicine when (exactly) yesterday.’

2.3 Successive-Cyclic Movement

For speakers who allow extraction from finite CPs – a regional characteristic of southern varieties of German – *alles* can occur in the matrix clause of long-distance *wh*-movement.²⁵

²³ The degree of unacceptability depends once again on whether there is a rising intonation on *wer* as the beginning of a hat-contour falling on *Medizin*; having this prosody corresponds to the less marginal, perhaps even fully acceptable judgment. Definite DP subjects do not require this prosody to be fully acceptable when occurring to the left of weak object pronouns. Also, it is important not to stress the pronoun, as it would no longer be weak. Adding an adverb to the left of *seine Medizin* helps insure that *ihm* be de-stressed.

²⁴ Depending on where *wann* ‘when’ originates, it is possible that (27) is confounded with a Superiority violation. If *wann* is generated too low, in order to avoid a superiority violation, it would need to scramble to a position higher than the derived position of *wer* to the left of *ihm*. This movement step may not be available for *wann* (see Müller, 2011, ch. 3, sec. 3.4, for discussion of derivations with two argument *wh*-phrases). If the confound were to hold, one would have to resort to multiple-*wh* questions such as *Wem hast du gesagt, dass ihm wer gestern geholfen hat?* ‘Who did you tell that you helped who yesterday?’. These are hard to judge to begin with, which is why they are not made discussed in the main text. The prediction, however, is clear. If the *wh*-subject in the embedded clause were to behave like *alles* in the examples above, that is not be able to occur to the left of weak object pronouns, then we would expect the question not to be acceptable with the following word order: *Wem hast du gesagt, dass wer ihm gestern geholfen hat?*

²⁵ This is yet another way in which invariant *alles* is to be distinguished from inflecting *all-*. Bobaljik (2003: 121) notes that *all-* cannot be floated in CP, to which we can add that floating in the same position where invariant *alles* can be floated is also impossible.

- (i) Welche Würste hat der Peter [_{VP} (*all-e) gesagt [_{CP} (*all-e) dass der Hund gegessen hat]]?
 which sausages has the Peter all-PL said all-PL that the dog eaten has
 ‘Which sausages did Peter (*all) say that the dog ate?’

Consider the following sentence.

- (28) [CP *Wem*₁ hat der Andreas **alles** gedacht, [CP dass die
 who.DAT have.3SG the.NOM Andreas ALL thought that the.NOM
 Georgine noch *e*₁ einen Schnapps einschenken würde]] ?
 Georgine yet a.ACC schnapps pour would.3SG
 ‘Who all did Andreas think that Georgine would pour another schnapps?’

Facts like (28) follow if *alles* in the matrix clause marks the position of an intermediate chain-link created by successive-cyclic movement of the associate *wem* ‘who’. Indeed, if the CLG in (5) is correct, and if long-distance *wh*-movement is in fact bounded and proceeds successive-cyclically (Chomsky, 1973, 1977), this is what we would expect—particularly if successive-cyclic movement proceeds through CP and some verbal projection alike (Chomsky, 1986, 2000, 2001).²⁶

There are two reasons to believe that *alles* in (28) marks a step of successive-cyclic movement. For one, as an alternative to *alles* floating off the chain-link created through successive-cyclic *wh*-movement, one might suppose that *alles* moved there from the embedded clause. This alternative is unlikely given that there is no other movement type that German makes available that (a) targets this position, and (b) is not clausebound. Scrambling is the only alternative movement transformation in German that can move a non-pronominal DP to a clause-medial position. However, scrambling is famously bounded by finite clauses in German:

- (29) a. Vielleicht hat [den Apfel]₁ ja die Maria da *e*₁
 maybe have.3SG the.ACC apple DPRT the.NOM Maria there
 hingelegt.
 put
 ‘Maybe Maria put the apple there.’
 b. *Vielleicht hat {[den Apfel]₁} ja der Peter {[den
 maybe have.3SG the.ACC apple DPRT the.NOM Peter the.ACC
 Apfel]₁} gemeint, [CP dass die Maria da *e*₁ hingelegt hat].
 apple reckoned that the.NOM Maria there put have.3SG
 ‘Maybe Peter thought/said that Maria put the apple there.’

The other alternative for how *alles* could occur in the matrix clause in (28) is by being base-generated there. However, base generating here would miss a crucial generalization. *Alles* is only allowed if there is a clausemate chain link of its associate as shown by the sentences in (30). (30a) shows that *alles* cannot be in the embedded clause when *wh*-movement is confined to the matrix clause; (30b) shows that *alles* cannot be in the matrix clause if *wh*-movement is confined to the embedded clause.

- (30) a. [CP₁ *Wem*₁ hat der Peter *e*₁ {alles} erzählt, [CP₂ dass
 who.DAT have.3SG the.NOM Peter ALL told that

²⁶ One might expect *alles* to be possible also in intermediate CPs under these circumstances. This is not the case. Henry (2012) proposes an approach to quantifier float that assumes that the union of all languages produces the set of float positions equivalent to the set of all movement positions made available by UG. It seems that 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.

- die Maria {***alles**} der Susi geholfen hat]]?
 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
 the.NOM Peter have.3SG ALL known who.ACC the.NOM
 Maria *e*₁ {alles} liebt]].
 Maria ALL love.3SG
 ‘Peter knew who all Maria loves.’

The contrasts in (30) indicate that *alles* must be a clausemate of a chain-link of its associate. It makes sense, then, that matrix *alles* in (28) is acceptable, while embedded *alles* in (30a) and matrix *alles* in (30b) are not.

Alles is also acceptable in the intermediate clause of questions spanning three clauses (within the limits that multiple embeddings are acceptable, of course):²⁷

- (31) ?[_{CP} *Wem*₁ hat die Christl {**alles**} gemeint, [_{CP} dass der
 who.DAT have.3SG the.NOM Christl ALL reckoned that the.NOM
 Andreas {**alles**} gedacht hat, [_{CP} dass die Georgine noch *e*₁ {**alles**}
 Andreas ALL thought have.3SG that the.NOM Georgine yet ALL
 einen Schnapps einschenken würde]] ?
 a.ACC schnapps pour would.3SG
 ‘Who all did Christl say/think that Andreas thought that Georgine would pour
 another schnapps?’

For (31), it is a priori less clear how clausemateness is satisfied for *alles* in the intermediate clause (CP2). However, treating *alles* as living on the chain predicts this, both the fact that *alles* can be found in intermediate positions of long-distance *wh*-movement, but also more generally the fact that *alles* is parasitic on a *local* chain. Alternative approaches need to stipulate the required local dependency between *alles* and its associate, and need to re-encode it independent of the locality of movement.

²⁷ Note also that the instances of *alles* are again wrapped by braces to indicate that there can only be one *alles* per sentence with a single associate. An anonymous reviewer for GLOW 2020 points out that they find sentences with multiple instances of *alles* acceptable *if* they occur in separate clauses. This was the first time I came across this judgment—if the judgment was not confounded with something, so that there is indeed such a population, one might investigate whether each instance of *alles* has “its own scope” or, more generally, has its own semantic import, in order to distinguish between an adverbial analysis and one where there are multiple spell-outs of a stranded quantifier. It may be worth noting that the example offered involved the particle *denn* left-adjacent to the matrix *alles* (*Was hat er denn alles gemeint, dass sie alles gelesen habe?*). While I agree that this sentence is improved – even if clearly not perfect –, when *denn* is taken out, the sentence is again unacceptable for me (**Was hat er alles gemeint, dass sie alles gelesen habe?*), and the contrast is even starker with a complex *wh*-associate (**Wem seine Gläser hat er alles gemeint, dass sie alles auffüllen sollte?*); separating *denn* from *alles* with an adverb (e.g. *gestern* ‘yesterday’) also seems to undo the amelioration (**Was hat er denn gestern alles gemeint, dass sie alles gelesen habe?*). I conclude that *alles* can be stacked onto *denn* to add a plurality interpretation for the relevant-common-ground content that *denn* points to (for discussion of the syntax and meaning contribution of *denn* see Bayer et al., 2016 and references therein). This kind of *alles* then ought to be treated as different in kind.

2.3.1 Landing Site of Successive-Cyclic *Wh*-Movement

What clause medial projection *alles* is in in (28) is more difficult to establish. There are some facts that point to *vP*, which would fit standard Phase Theory assumptions about successive-cyclic movement (Chomsky, 2000, 2001), where *vP*, intended as the functional projection that introduces the external argument, is a strong phase that forces long movement to proceed through its specifier.

The lower bound on the position of intermediate *alles* is plausibly *vP*. Consider the following facts. Within a single clause, *alles* can occur on either side of the DAT *wh*-indefinite argument of *zeigen* ‘show’. The (non-specifically interpreted) *wh*-indefinite marks its base position, and the verb *zeigen* has the underlying object structure DAT>ACC; see section 2.1.1.

- (32) Weißt du, [CP *was* der Lehrer {**alles**} wem {**alles**} gezeigt
 know.2SG you what.ACC the.NOM teacher ALL who.DAT ALL shown
 haben soll?
 have MOD.3SG
 ‘Do you know what all the teacher supposedly showed to someone?’

In the matrix clause targeted by long distance *wh*-movement, however, *alles* is only acceptable to the left of a *wh*-indefinite internal argument:

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

Under the assumption that the DAT *wh*-indefinite is in its base position inside the VP, intermediate *alles* is plausibly outside the VP, in *vP*. Of course, these facts are also consistent with placing *alles* in an outer specifier of VP, like in Barriers-style adjunction (Chomsky, 1986).²⁸

Turning to the upper bound on the position of intermediate *alles*, consider the following facts:

- (34) *Was*₁ hat [_{TP} der Peter [?? {***alles**} [_{VP} ihm [_{VP} gestern [_{VP}
 what.ACC have.3SG the Peter ALL him.DAT yesterday
 {**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?’

In the sentence in (34), *alles* must occur to the right of the weak object pronoun *ihm*

²⁸ Ideally, the *wh*-indefinite test would be applied with a *wh*-indefinite *subject* so to test whether *alles* must occur to the left of *wh*-indefinite subject. If that were so, and the *wh*-indefinite subject must indeed remain in *vP*, then the result would situate *alles* minimally at the edge of *vP*. However, long *wh*-questions with a *wh*-indefinite matrix subject are perhaps too odd to begin with to be judged with confidence.

‘him’. Müller (2001) argues that weak object pronouns surface in the leftmost position internal to νP , which would place intermediate *alles* maximally in νP . The alternative is that weak object pronouns can also occur in TP (*e.g.* Anagnostopoulou, 2008). If we generalize Müller’s attractive assumption so that, given their prosodic status, weak object pronouns always occur at the left edge of the projection they syntactically occur in, then *ihm* in (34) must be placed in νP : *ihm* occurs to the right of the subject, and the subject occurs at most in TP if the verb-second verb *hat* is in C^0 , so that *ihm* cannot be in TP because then it would have to occur in the left edge of TP and therefore to the left of the subject; *ihm* must then occur at most in the next projection down, by assumption νP . Given that there is no pressing reason to believe that intermediate *alles* occurs in a position other than νP , I conclude that intermediate *alles* does indeed occur in νP in line with the null hypothesis as provided by Phase Theory.

3 *Alles* Lives on Chains Part 2: *Alles* Behaves Like Chain Links

The previous section established that *alles* distributes syntactically like chain links of its associate. The conclusion from these facts is that *alles* can occupy the same syntactic position as a chain link of its associate. Further, we know that *alles* and its associate *can* form a constituent, and this lends support to the supposition that they always do so and that when *alles* is divorced from its associate it has been stranded as a result of movement—where *stranding* can again be understood as extraction or scattered deletion.

This section adds further evidence to the same conclusion, but in a slightly different way. The general argument goes as follows: If *alles* and its associate form an (underlying) constituent wherever *alles* is found, then we expect overt instances of *alles* to cause ungrammaticality wherever overt instances of the associate cause ungrammaticality. In other words, if this is the case as I will argue, then sentences with *alles* are *necessarily* parsed with a derivation where the associate occurred (at some stage in the derivation) in the position marked by *alles*. The first effect, which I will call *Reis blocking*, is unacceptability caused by a certain object word order with the ditransitive verb *aussetzen* ‘to subject’; the second effect, which I will call *restitution blocking*, is the loss of the ambiguity of *wieder* ‘again’ with the word order AGAIN>ACC. If this argument can be established for the two configurations just described, then there is no reason not to generalize the conclusion to any position where *alles* is found, thus supporting the CLG in (5).

3.1 Reis Blocking

In arguing that *alles* can occur in its associate’s base position, Reis (1992) provides an interesting paradigm. Run-of-the-mill ditransitive verbs in German allow both object orders in derived positions, above adverbs or subjects. This is shown for *vorstellen* ‘introduce’ and the objects above a focused adverb in (35).

- (35) a. Hat er den Peter der Maria HEUte vorgestellt?
have.3SG he.NOM the.ACC Peter the.DAT Maria today introduced
‘Did he introduce Peter to Maria today?’
b. Hat er der Maria den Peter HEUte vorgestellt?
have.3SG he.NOM the.DAT Maria the.ACC Peter today introduced

In contrast, Reis shows that the verb *aussetzen* ‘to subject’ allows only one order of its objects when both appear in a derived position. She gives the following contrast: the order ACC>DAT (*den Peter der Prüfung*) in (36a) is acceptable, but the order DAT>ACC (*der Prüfung den Peter*) in (36b) is not.

- (36) a. Hat er den Peter der Prüfung HEUte ausgesetzt?
 have.3SG he.NOM the.ACC Peter the.DAT exam today subjected
 ‘Did he subject Peter to the exam today?’
 b. *Hat er der Prüfung den Peter HEUte ausgesetzt?
 have.3SG he.NOM the.DAT exam the.ACC Peter today subjected

Reis also shows that a *wh*-phrase behaves just as a non-*wh* phrase in this regard (with or without *alles*) by showing that the sentence in (37a) is unacceptable. We can add that the order ACC>DAT with the *wh*-phrase is acceptable again, mirroring the plain example in (35a). (It is a little harder to find the right intonation for (37b), hence the judgment with a ?.)

- (37) a. *Wer hat der Prüfung *wen* (alles) HEUte ausgesetzt?
 who.NOM have.3SG the.DAT exam who.ACC ALL today subjected
Intended: ‘Who subjected who (all) to the exam today?’
 b. ?Wer hat *wen* (alles) der Prüfung HEUte ausgesetzt?
 who.NOM have.3SG who.ACC ALL the.DAT exam today subjected
 ‘Who subjected who (all) to the exam today?’

We can also add that the effect disappears when one of the objects is *wh*-moved to the front, shown here for the ACC object in (38). We therefore have to understand the constraint on *aussetzen* as constraining the order of its objects only when they are together, as a form of order preserving movement.

- (38) Wen hat er der Prüfung HEUte ausgesetzt?
 who.ACC have.3SG he.NOM the.DAT exam today subjected
 ‘Who did he subject to the exam today?’

With this much established, the interesting effect that Reis shows is that *alles* alone can induce the same effect (Reis, 1992: 483; glosses, boldface and italics added). The sentence in (39) is unacceptable just as the analogous sentences in (36b) and (37a).²⁹

- (39) **Wen* hat er der Prüfung **alles** HEUte ausgesetzt?
 who.ACC have.3SG he.NOM the.DAT exam ALL today subjected
Intended: ‘Who all did he subject to the exam today?’

From the sentence in (39) we must infer that *alles* behaves as its associate object itself, thus producing a configuration in which the two objects of *aussetzen* are together, and in the wrong order. In other words, I conclude that the presence of *alles* forces a derivation where both objects are scrambled in a way that does not preserve the canonical order;

²⁹ Compare the unacceptable sentence with *alles* in (39) to the acceptable one with the discourse particle *denn* in (i) (Reis, 1992: 483, glosses and translation added):

- (i) Wen hat er der Prüfung *denn* HEUte ausgesetzt?
 who.ACC have.3SG he.NOM the.DAT exam DENN today subjected
 ‘Who are the common-ground-relevant people that he subjected to the exam today?’

the presence of *alles* in that position blocks the derivation that converges in (38), where the ACC object *wh*-moves to Spec,C directly without scrambling above the adverb *heute*. In other words, there is a chain link of the ACC object where *alles* is.³⁰ The derivation of (39) is thus as indicated in (40):

- (40) [CP *Wen*₁ [C' hat er [vP [DP der Prüfung]₂ [DP *e*₁ **alles**]₃
 who.ACC have.3SG he.NOM the.DAT exam ALL
 HEUte [vP *e*₃ *e*₂ *ausgesetzt*]]]]]?
 today subjected
Intended: ‘Who all did he subject to the exam today?’

The converse word order which is compatible with an order-preserving derivation is acceptable:

- (41) [CP *Wen*₁ [C' hat er [vP [DP *e*₁ **alles**]₃ [DP der Prüfung]₂
 who.ACC have.3SG he.NOM ALL the.DAT exam
 HEUte [vP *e*₃ *e*₂ *ausgesetzt*]]]]]?
 today subjected
 ‘Who all did he subject to the exam today?’

3.2 Restitution Blocking

The next piece of evidence relies on the disappearance of the ambiguity associated with the adverb *wieder* ‘again’ based on von Stechow (1996). There are two readings associated with the adverb *again*: the so-called *repetitive* reading, and the so-called *restitutive* reading. In both readings an initial state is brought about anew. For example, in the sentence in (42) the sponge was wet, then it becomes dry, and then it is brought back to its wet state again (with potentially multiple iterations thereof).

- (42) She made the sponge wet again.

The restitutive reading is the reading that limits itself to the return to the original state – what is repeated is merely the initial state. The repetitive reading, instead, adds that the person who brought about the (potentially many) return(s) to the original state is the same person who brought about the initial state.³¹ Von Stechow (1996) shows that interestingly in German the relative word order of *wieder* ‘again’ and the ACC object affects the availability of the restitutive reading. While with the order ACC>AGAIN in

³⁰ Note that a consequence of these facts is that *if* there is successive-cyclic *wh*-movement through a verbal projection – as is indeed argued in section 2.3 –, then the landing site of scrambling above *heute* is necessarily lower than the landing site of successive-cyclic *wh*-movement. Assume that successive-cyclic *wh*-movement proceeds through vP. The relevant scrambling steps must then also target at most vP, *and* successive-cyclic *wh*-movement must follow all such scrambling steps by some principled way. Otherwise, the (strong) relative unacceptability of (39) would be unexpected under the assumption that the objects need to preserve the canonical order whenever they both move together, and *together* means triggered by the same movement type. A derivation would then be available where the two objects do not move together: first the ACC moves successive-cyclically to vP (later stranding *alles* there), then the DAT scrambles to vP above the landing site of successive-cyclic movement.

³¹ Von Stechow (1996) proposes to analyze the difference in readings in terms of difference in scope. The adverb can occupy one of two positions: one that has scope only over the state, and one that has scope over the event, which includes the agent of the event; the former corresponds to the restitutive reading (AGAIN>STATE), the latter to the repetitive reading (AGAIN>CAUSE-BY-AGENT-X>STATE). See also section 4.3.

associate, the asymmetry dissolves into the same asymmetry that we observed for the ACC object itself in (43). In other words, if we understand *alles* as marking a chain link of its associate, then there is but a single asymmetry and we can extend the same explanation.

Reis blocking and restitution blocking thus constitute evidence that *alles* behaves like one of its associate’s chain links. Section 2 argued that *alles* and its associate have the same distribution. This section added evidence to understanding the distribution as following from shared constituency (at least) up to the point in the derivation where the quantifier is stranded. This conclusion is expected if the generalization is correct that *alles* lives on its associate chain. The facts are derived by the assumption that *alles* always starts out the derivation in a shared deep structure constituent with its associate and is stranded at some point in the derivation.

4 *Alles* Lives on Chains Part 3: the Anti-A-Trace Effect

To recapitulate, sections 2–3 have provided evidence to support a more general version of the Chain Link Generalization which holds that *alles* and its associate form a syntactic equivalence class:

- (47) *Chain Link Generalization – (too) general version:*
- a. The distribution of the associate of *alles* bounds the distribution of *alles*.
 - b. An overt instance of floated *alles* in some position P marks the underlying presence of its associate in P at some point in the derivation.

This section provides four paradigms to argue that in fact a more narrow generalization is the more adequate one—the CLG repeated in (48). This more narrow version restricts the generalizations in (47) to the associate’s \bar{A} -derivation.

- (48) *Chain Link Generalization for floated alles (CLG):*
 Given a derivation, *alles* occurs in any position occupied by an \bar{A} -chain link of its associate.

What would it look like for the more narrow version in (48) to be true? In essence, the full CLG entails that there is a prohibition on A-stranding of *alles*,³³ where ‘stranding’ is again to be understood as indeterminate between sub-extraction and full movement plus subsequent partial non-pronunciation. This means that, given a derivation where the associate of *alles* undergoes both some number of A-movement steps and some number of \bar{A} -movement steps, *alles* is found in positions from which its associate \bar{A} -moved, but not in ones from which its associate A-moved. In Government and Binding (Chomsky, 1981) parlance, where A-traces and \bar{A} -traces constitute two separate formatives of the theory, we can rephrase the restriction on *alles* as follows: given a derivation, floated

³³ The \bar{A} -restriction is particularly interesting given that McCloskey (2000) and Fitzpatrick (2006) reach the same conclusion in their work on other languages—McCloskey about *all* in West Ulster English, Fitzpatrick about invariant ‘all’ in Russian, and numeral quantifiers in Korean and Japanese. McCloskey (2000) proposes to account for this restriction in terms of a ban on Improper Movement: The *wh*-phrase associate is generated as the complement of *all*. *All* is stranded by sub-extraction, specifically by movement of the *wh*-associate through the specifier of *all*. Improper Movement with A-stranding of *all* arises because movement to “Spec,*all*” is \bar{A} -movement.

alles can occur in the position of its associate’s \bar{A} -traces, but not in the position of its associate’s A-traces. In other words, floated *alles* exhibits an “Anti-A-trace effect”.

Consider the abstract derivations in (49); A- t / \bar{A} - t stand for traces of A-movement/ \bar{A} -movement.

- (49) a.* [XP wh_1 [YP \bar{A} - t_1 [ZP A- t_1 *alles*]]]]
 b. [XP wh_1 [YP [\bar{A} - t_1 *alles*]₂ [ZP A- t_2]]]]

In (49a-b), the associate wh_1 underwent the following derivation: (i) A-movement from the base position in ZP to YP; (ii) \bar{A} -movement from YP to XP. With such a derivation, *alles* is licit in YP, from which \bar{A} -movement has occurred ((49b)), but illicit in ZP, from which A-movement has occurred ((49a)).³⁴

The four arguments for this conclusion come from *Anti Weak-Crossover* (WCO) effects, *Anti-Superiority* effects, the *wieder* ‘again’ paradigm from section 3, and raising. The latter two effects directly involve A-movement so that the form of the argument will be straightforward. The former two effects involve scrambling as the movement step, and the argument will go as follows: (i) A-movement can obviate WCO and Superiority; (ii) A-movement therefore applied when these effects were obviated; (iii) *alles* becomes illicit in exactly the position from which A-movement had to occur in order to obviate WCO/Superiority.

In regards to premise (i) in connection to scrambling, a foreword is worthwhile before going into the details as the form of the argument will set aside a number of controversies. On the one hand, some authors have suggested that scrambling is uniformly \bar{A} -movement, and that A-movement effects are to be derived in other ways (see e.g. Müller and Sternefeld, 1994). On the other hand, the generalization that it is scrambling that obviates WCO and Superiority has been called into question as well. Fanselow et al. (2005) and Fanselow and Féry (2008) instead suggest an extragrammatical explanation for obviation of WCO and Superiority, respectively. I will entirely set aside these controversies, but believe that the bulk of arguments will address the former issue by overall painting the picture that scrambling (in the configurations discussed) is indeed A-movement in German.

4.1 Scrambling and Weak Crossover

Consider the following contrast in binding possibilities.³⁵

- (50) *Intended*: ‘Who are all the individuals x , such that x ’s teacher hit x ?’

³⁴ The effect is specific to the A-movement step involved in (49); sentences that do not require A-movement in order to satisfy the property of an element of the sentence are acceptable. The abstract derivation in (i) is grammatical, as shown for example by the base position facts in section 2.1.

- (i) [XP wh_1 [YP (\bar{A} - t_1) [ZP \bar{A} - t_1 *alles*]]]]

³⁵ As usual, the relative degradedness of (50b) in comparison to (50a) is what is at stake here. While for me the bound-pronoun reading in (50b) 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.

- 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*. That is, the string in (50a) can be answered with either (51a) where there is only one teacher, or (51b) where there are as many teachers as answers as long as everyone had different teachers. The string in (50b), however, can only be answered with (51a). ((51a) would be more natural with a pronoun substituting ‘his teacher’, *ihm* ‘3.DAT’; the pronoun is impossible for (51b).)

- (51) a. Der Peter_i wurde von seinem_k Lehrer geschlagen, die Maria_j
 the.NOM Peter PASS.3SG by his.DAT teacher hit the.NOM Maria
 wurde von seinem_k Lehrer geschlagen, *etc.*
 PASS.3SG by his.DAT teacher hit
 ‘Peter_i was hit by his_k teacher, Maria_j was hit by his_k teacher, *etc.*’
- b. Der Peter_i wurde von seinem_i Lehrer geschlagen, die Maria_j
 the.NOM Peter PASS.3SG by his.DAT teacher hit the.NOM Maria
 wurde von ihrem_j Lehrer geschlagen, *etc.*
 PASS.3SG by her.DAT teacher hit
 ‘Peter_i was hit by his_i teacher, Maria_j was hit by her_j teacher, *etc.*’

In (50a), *alles* marks a scrambling position, above the subject; in (50b), *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. For concreteness, we can adopt the following formulation of a WCO constraint (from Heim, 1989 as discussed in Müller and Sternefeld 1994).

- (52) *Condition on Bound Variable Pronominals:*
 A bound-variable pronoun must be coindexed with a c-commanding A-Position at LF.

The specific type of WCO configuration that is relevant in this section is where a possessive pronoun cannot, or can only with great difficulty, be understood as bound by an operator contained in an \bar{A} -dependency that spans the bound pronoun. For example, an English sentence as (53a) is generally judged as quite degraded. The configuration in (53b), in comparison, where both the head and the tail of the \bar{A} -dependency c-command the possessive pronoun, is perfectly acceptable (adapted from Safir, 2017: 1).

- (53) a. ??Who₁ did [his₁ mother] praise *t*₁?
 b. Who₁ *t*₁ praised [his₁ mother]?

Scrambling in German (and other languages) can obviate this effect (*cf.* Grewendorf, 1988; Webelhuth, 1992; Lee and Santorini, 1994). German (54a), corresponding to the degraded English (53a), is perfectly acceptable. The idea is that *wh*-movement of *wen*

(with or without *alles*) in (54a) is preceded by a step of scrambling, as indicated in the corresponding (54b).

- (54) a. Wen_i (alles) hat sein_i Lehrer geschlagen?
 who ALL has his teacher hit
 ‘Who (all) did his teacher hit?’
 b. Wen_{i,1} hat [_{VP} t’₁ [_{VP} sein_i Lehrer t₁ geschlagen]]?

In addition, WCO cannot be obviated when the bound possessive pronoun is in a clause that cannot be reached by scrambling. In (55), the bound pronoun *seine* is contained in the matrix subject, while the *wh*-phrase originates in the embedded clause. Because scrambling is clause-bound in German, a long scrambling step preceding *wh*-movement is impossible. The *wh*-movement dependency will necessarily span the pronoun that the operator binds, and induce a WCO effect.

- (55) *_{[CP} Wen_{i,1} dachte seine_i Mutter, [_{CP} dass der Lehrer t₁ geschlagen hat]]?
 who thought his mother that the teacher hit have.3SG
Intended: ‘For which person *x* did *x*’s mother think that the teacher hit *x*?’

Against this background, it seems that (50a) has the derivation in (56); Σ stands for scrambling: (i) *wen* scrambles above the subject; (ii) from there, *wen* A-binds the possessor, obviating WCO; (iii) *wen wh*-moves on to Spec,C. *Alles* thus occurs in a position corresponding to the *wh*-trace of *wen*.

- (56) [_{WH_i} [_{t_{wh}} **alles** [[_{SUBJECT} *pro*_i NP] [t _{Σ}]]]]

If scrambling over the subject is what allows obviation of WCO, then, were (50b) acceptable, it would need to have the same derivation as (50a) in (56), differing only in the position of *alles*, as in (57).

- (57) [_{WH_i} [_{t_{wh}} [[_{SUBJECT} *pro*_i NP] [t _{Σ} **alles**]]]]

However, given that (50b) is unacceptable, (57) 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 (50b) 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—(58a), (58b), and (58b’). All three derivations must fail.

- (58) a. [_{WH} [_{SBJ} [t_{wh} alles]]] \Rightarrow WCO
 b. [_{WH} [t_{wh} [t _{Σ} [_{SBJ} [t_{wh} alles]]]]] \Rightarrow IMPROPER MOVEMENT
 b’. [_{WH} [t_{wh} [_{SBJ} [t _{Σ} [t_{wh} alles]]]]] \Rightarrow IMPROPER MOVEMENT

(58a) 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. (58b/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, (58b/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 (50b).³⁶

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.³⁷ The distribution of *alles* must be restricted to positions where \bar{A} -traces are left. These conclusions are in line with the observation from English that it is indeed A-movement that obviates WCO, while \bar{A} -movement cannot. Raising is a typical example for this: In (59a) (adapted from Safir 2017) *everyone* A-moves to the matrix subject position thus making the bound pronoun interpretation of *his* possible; in (59b), though there is *wh*-movement in the matrix clause, *wh*-movement of *who* is preceded by the same step of A-movement to the matrix subject position as in (59a), therefore making the bound pronoun interpretation of *his* available; (59b) thus contrasts with (59c) (=53a) and (59d) where there is no A-movement step to a position where *his* could have been A-bound by *who*.

- (59) a. Everyone_i seems [to his_i mother] [TP *t* to be a genius].
 b. Who_i *t* seems [to his_i mother] [TP *t* to be a genius].
 c. ??Who_i did [his_i mother] praise *t*?
 d. ??Who_i does it seem [to his_i mother] [CP *t* is a genius]?

4.2 Scrambling and Superiority

Superiority is, most broadly, the generalization that *wh*-phrases in multiple *wh*-questions “compete” to *wh*-move to Spec,C. The effect is that when a *wh*-phrase in a multiple *wh*-question moves, that is strictly lower than some other *wh*-phrase that could have moved to Spec,C, the sentence is unacceptable.³⁸ The English pair in (60) illustrates:

³⁶ It is in principle possible that the constituent *wen* first scrambles above the subject, followed by scrambling of the subject again over *wen*. WCO could then be obviated in the step preceding scrambling of the subject, for example as in (i). Given the contrast found by native speakers, I take it that this derivation is, at least, less probable in some sense, such that the contrast arises at least as a matter of likelihood of parses of the string and the conclusion is still warranted.

- (i) [CP *wen*₁ⁱ [TP [DP *pro*ⁱ NP]₂ [_{vP} *t*₁ [_{vP} *t*₂ [VP *t*₁]]]]]

³⁷ Notice in this connection that based on this conclusion here, 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 *was*₁ **alles** der Maria *e*₁ gezeigt?
 where have.2SG you.NOM what.ACC ALL the.DAT Maria shown
 ‘Where did you show what all to Maria?’
 b. ??Wo hast du *was*₁ der Maria *e*₁ **alles** gezeigt?
 where have.2SG you.NOM what.ACC the.DAT Maria ALL shown
- (ii) a. Welcher Manager hat *wen*₁ (**alles**) heute *e*₁ gefeuert?
 which.NOM manager have.3SG who.ACC ALL today fired
 ‘Which manager fired who (all) today?’
 b. Welcher Manager hat *wen*₁ heute *e*₁ (***alles**) gefeuert?
 which.NOM manager have.3SG who.ACC today ALL fired

³⁸ There have been various proposals for this effect. The particular version should not matter for the present purposes, but for concreteness I will adopt a restrictive Attract-based version following the insights in Oka (1993), specifically that interrogative C bears a feature that triggers movement of the

- (60) a. Who₁ [TP e₁ [VP bought what₂]] ?
 b. *What₂ did [TP who₁ [VP buy e₂]] ?

For Superiority, as for WCO, obviation effects have long been observed in German.³⁹ So for the German pair in (61) both sentences are acceptable (Müller, 2011: 135, brackets and translation added).

- (61) a. (Ich weiß nicht) [CP wer₁ C [TP t₁ [was₂ gesagt hat]]]
 I know not who.NOM what.ACC said has
 ‘(I don’t know) who said what.’
 b. (Ich weiß nicht) [CP was₂ C [TP wer₁ [t₂ gesagt hat]]]
 I know not what.ACC who.NOM said has

In contrast, the effect reappears across finite clause boundaries (Müller, 2011: 138):

- (62) a. Wer₁ hat t₁ geglaubt [CP dass der Fritz wen₂ mag] ?
 who.NOM has believed that the Fritz whom.ACC likes
 ‘Who believed that Fritz likes who?’
 b. *Wen₂ hat wer₁ geglaubt [CP dass der Fritz t₂ mag] ?
 whom.ACC has who.NOM believed that the Fritz likes

I will assume for this section that the correct analysis for the contrast is that scrambling, just like raising, can obviate Superiority.⁴⁰ Because scrambling is bounded by finite clauses, Superiority can be obviated within a finite clause ((61)), but not across finite clauses ((62)).

With this much in mind, consider the following contrasts:

- (63) a. *Wen* hast du **alles** wofür verraten?
 who.ACC have.2SG you.NOM ALL what.for betrayed
 ‘Who all did you betray for what?’
 b. *Wen* hast du wofür (??**alles**) verraten?
 (64) a. *Wem* hast du **alles** wie geholfen?
 who.DAT have.2SG you.NOM ALL how helped
 ‘Who all did you help (and) how?’
 b. *Wem* hast du wie (??**alles**) geholfen?
 (65) a. *Wen* hast du **alles** wann getroffen?
 who.ACC have.2SG you.NOM ALL when met
 ‘Who all did you meet (and) when?’

highest *wh*-phrase in its c-command domain to its specifier.

³⁹ For an overview see Müller (2011: chapter 3, sections 3.2–3.4).

⁴⁰ Example (ia) illustrates that raising obviates Superiority for English, (ib) does so for German.

- (i) a. What₁ t₁ seems [to whom]₂ [TP t₁ to taste awful]?
 b. Weißt du, [CP was₁ t₁ wem₂ [TP t₁ furchtbar zu schmecken] scheint]?
 know.2SG you.NOM what.NOM who.DAT awful to taste seem.3SG
 ‘Do you know what seems to whom to taste awful?’

Of course, it is known that other non-A-movement operations are also capable of obviating Superiority, for instance topicalization, or supposed focus movement in the literature on *wh*-fronting (*e.g.*, see Torrence and Kandybowicz, 2015 on *wh*-fronting in Krachi). The superiority paradigm is thus not an argument for an A- vs. \bar{A} -dichotomy of stranding in and of itself; rather it should be seen as support for the conclusion reached based on WCO in the previous section.

- b. *Wen* hast du wann (??**alles**) getroffen?

In each of the pairs, when *alles* occurs to the right of the in-situ *wh*-phrase, the sentence is much worse, or still clearly dispreferred, across speakers.⁴¹ For the vast majority of speakers asked in general so far, the use of *alles* with adjunct *wh*-phrases is very limited. *Alles* with *wo* ‘where’ is generally allowed, *wann* ‘where’, *wie* ‘how’, and *wofür* ‘(purpose) what for’ are very marginal, while *warum/was/wieso* ‘(reason) why’ are completely impossible. This fact is important as it means that in (63)–(65) *alles* is necessarily interpreted with the fronted argument *wh*-phrase.⁴² This means that the contrasts above track the derivation of the fronted *wh*-associate. Indeed the contrasts are explained by the assumption that *alles* cannot be stranded in the tail of A-movement, in this case Scrambling.

In each of the three cases, the fronted *wh*-phrase originates in a position that is structurally lower than the *wh*-adjunct, which, let’s assume, is in *vP*.

$$(66) \quad [\text{CP WH}_1 \dots [\text{vP} [\text{AdvP WH}_2] [\text{vP} \dots [\text{VP } e_1 \text{ V}]]]]$$

In order for the configuration in (66) not to give rise to superiority effects, the lower *wh*-phrase must occur in a position higher (or non-lower) than the *wh*-adjunct at the moment of *wh*-movement. Within a finite clause, one way to achieve this is via scrambling, yielding the configuration in (67).

$$(67) \quad [\text{CP WH}_1 \dots [\text{vP } e_1 [\text{vP} [\text{AdvP WH}_2] [\text{vP} \dots [\text{VP } e_1 \text{ V}]]]]]]$$

This means that Superiority-obviating configurations have at least two chain links of the fronted *wh*-phrase in the clause: the base position below the *wh*-adjunct, and the scrambling position above the *wh*-adjunct. Were it possible for *alles* to occur in just any chain link of its associate, then there should be no contrast between the pairs above. However, given that there is a contrast, it seems that *alles* cannot be floated off the step of scrambling from below the *wh*-adjunct, but that it can be floated off the step of *wh*-movement from above the *wh*-adjunct.

4.3 *Wieder* Again

Section 3.2 argued that *alles* induces restitution blocking in the word order *alles*>AGAIN just as its associate does in the word order ACC>AGAIN. If the analysis by von Stechow (1996) for the loss of the restitutive reading is adopted, it follows that *alles* cannot be floated off of A-movement. The analysis that von Stechow provides is one based on scope. The adverbial *wieder* ‘again’ has only one lexical entry, with the rough meaning

⁴¹ This effect was not found with every single speaker asked. There is reason to believe that the stranding analysis may nonetheless be the right analysis for the speakers who accepted a (b) example of (63)–(65): Those speakers accepted *alles* to associate with the adjunct. In that case, *alles* is most plausibly not stranded off the fronted *wh*-phrase, but rather right-adjacent and in association with the adjunct *wh*-phrase, see (i). This means that the paradigm cannot be used to test anti-A-trace effects with these speakers.

(i) $[\text{CP WH}_1 \dots [\text{vP} [\text{WH}_2 \text{ alles}] \dots e_1 \dots]]$

⁴² To my ear the acceptable word order allows for a pair-list reading, but only where *alles* lists the multiple arguments within each of the argument-adjunct answer pairs. The reading where *alles* induces an exhaustive listing of singleton argument-adjunct pairs strikes me as odd.

“repetition of what is in the scope”. Scope is read off of the syntactic representation, so that the two different readings that are associated with *wieder* reflect two different positions in which *wieder* can occur. In one case it occurs low, taking just the VP in its scope, where the state is represented. This is the *restitutive* reading. In the other, it occurs higher, taking the causer/agent-containing event in its scope—the vP. This is the *repetitive* reading.

- (68) a. [vP AGENT [VP *wieder* [VP STATE]]] ‘low scope: restitutive’
 b. [vP *wieder* [vP AGENT [VP STATE]]] ‘high scope: repetitive’

Remember that the repetitive reading is available with ACC>WIEDER as well as with WIEDER> ACC, while the restitutive reading is available only with ACC>WIEDER. The restitutive reading thus clearly does not reflect the assumed base word order, which would be AGENT>WIEDER> ACC>V, so clearly some adjustments must be made. Von Stechow proposes that the ACC must move to check its Case, to a projection (AgrO) between VP and vP. This assumption explains why the object has to be to the left of the adverbial to yield the (lower) restitutive interpretation:⁴³

- (69) a. [vP AGENT [AgrOP ACC₁ [VP *wieder* [VP e₁ V]]] REST

Now, if *alles* was able to be floated off of A-movement, then it should be possible to float *alles* in the tail of ACC-Case movement from VP to AgrOP. The consequence would be that it would be possible to have *alles* occur not only to the left of *wieder*, with a restitutive reading, but also to the right of *wieder*, as illustrated in (70).

- (70) a. [CP ACC₁ ... [vP AGENT [AgrOP e_{1,A-bar} [VP *wieder* [VP e_{1,A} *alles* V]]]] REST
 b. [CP ACC₁ ... [vP AGENT [AgrOP e_{1,A-bar} *alles* [VP *wieder* [VP e_{1,A} V]]]] REST

However, as discussed in section 3.2, the word order ACC>...>WIEDER>*alles*>V is not compatible with the restitutive reading. This means that *alles* cannot be floated in the tail of the Case-movement chain—an A-chain.⁴⁴

4.4 Raising

The final, and in-principle strongest argument for an anti-A-trace effect of *alles* comes from the domain of raising (to subject) configurations. Showing that *alles* cannot occur in the tail of raising would constitute the strongest argument for an A-/Ā-split in the distribution of floated *alles*.⁴⁵ Consider the raising sentences in (71).⁴⁶

⁴³ The repetitive reading is also compatible the ACC>WIEDER word order because the object and the subject can move on further via scrambling so that even when *wieder* is in vP, it can be preceded by the object.

⁴⁴ Note that while this argument does support the idea that *alles* can only be floated on its associates’ Ā-chain, it also strongly undermines the idea that *alles* can be floated in its associate’s base position. Revisiting all the arguments made in section 2.1 is no trivial task. In fact, all basic diagnostics and generalizations, including Lenerz’ Generalization would need to be revisited in a way that includes some kind of order-preserving low movement within the VP–vP.

⁴⁵ While the facts seem very clear to me, this section comes last nonetheless because the contrasts are based on my judgments alone—the contrasts are based on scope judgments and the presuppositions that they trigger, which are generally more subtle to elicit.

⁴⁶ For a series of arguments in favor of *drohen* ‘threaten’ being a raising verb, see Reis (2005). In addition, the usual diagnostics can be applied. For instance, the examples in (i) show that the idiomatic reading is preserved with a sentential idiom, and the contrast in (ii) shows that a distributive reading is

- (71) a. Da droht etwas anzubrennen.
 there threaten.3SG something.NOM to.get.burnt
 ‘Something threatens to get burnt.’
 b. dass (da) etwas anzubrennen droht.
 that there something.NOM to.get.burnt threaten.3SG
 ‘that something threatens to get burnt there’

For subject *wh*-questions formed on the basis of raising sentences, where part of the chain that links the *wh*-phrase to the thematic position is an A-chain, the full CLG in (5) makes the following prediction: *alles* can occur in the matrix clause from which *wh*-movement applies, but *alles* cannot occur in the infinitival clause from which raising applies. The prediction for sentences like in (72a) is schematized in (72b), where ‘*t_{wh}*’ stands for a tail of *wh*-movement, and ‘*t_R*’ for one of raising.

- (72) a. [CP Was₁ [C' droht [TP₁ e₁ [TP₂ e₁ anzubrennen]]]] ?
 what.NOM threaten.3SG to.get.burnt
 ‘What threatens to get burnt?’
 b. [CP WH-NOM [TP *t_{wh}* {*alles*} [VP [INF *t_R* {**alles*} V] threaten]]]

Verb-second and the verb-final property of German, however, make it difficult to identify the clause boundary between the matrix clause and the raising complement.⁴⁷ I argue in this section that the clause boundary can be inferred by adverb scope facts, and

not available with raising (a) while it is with control (b).

- (i) a. dass mir die Haare zu Berge zu stehen drohen
 that me.DAT the.NOM.PL hair.PL to mountains to stand threaten.3PL
 ‘that I may soon really have enough of it’
 b. dass hier die Kacke so richtig zum Dampfen zu kommen droht
 that here the.NOM shit so properly to.the steam to come threaten.3SG
 ‘that the shit may soon hit the fan around here’
- (ii) a. #dass alle Teilnehmer den ersten Preis zu gewinnen scheinen/drohen
 that all.NOM.PL participants the.ACC first prize to win seem/threaten.3PL
 ‘that every participant seems/is threatening to win first prize’
 b. dass alle Teilnehmern den ersten Preis zu gewinnen versuchen
 that all.NOM.PL participants the.ACC first prize to win try.3PL
 ‘that every participant tries to win first prize’

⁴⁷ Extraposition of the infinitival cannot be used (innocuously) to make the clause boundary more apparent as pointed out to me by Stefan Keine (personal communication). Extraposed infinitivals are CPs in German and likely involve control structures instead. For instance, it is not possible to have a sentential idiom with extraposition; compare (a) with (b).

- (i) a. dass hier die Kacke so richtig am dampfen zu sein scheint
 that here the shit so properly at.the steaming to be seem.3SG
 ‘that the shit really seems to have hit the fan here’
 b. *dass hier die Kacke scheint, [so richtig am dampfen zu sein]
 that here the shit seem.3SG so properly at.the steaming to be
- (ii) a. dass mir die Haare zu Berge zu stehen drohen
 that me.DAT the.NOM hair to mountain to stand threaten.3PL
 ‘that something threatens to shock/scare/worry me’
 b. #dass mir die Haare drohen [zu Berge zu stehen]
 that me.DAT the.NOM hair threaten.3PL to mountain to stand

that once the clause boundary is made apparent by an adverb, the CLG’s prediction in (72b) is confirmed. In order to establish the scope diagnostic, consider first the following sentences:

- (73) a. dass wer wieder gekommen ist
 that who.NOM again come be.3SG
 ‘that someone came again’
 b. dass wieder wer gekommen ist
 that again who.NOM come be.3SG
 ‘that someone came again’

While both sentences receive the same English translation, there is a difference in meaning.⁴⁸ The *wh*-indefinite in example (73a) receives what we may call a “specific” interpretation. The *wh*-indefinite in example (73b), on the other hand, receives what we may call a “non-specific” interpretation. If we use the terminology of Diesing (1992), the specific interpretation corresponds to a *presuppositional* reading, and the non-specific interpretation corresponds to an *existential* reading.⁴⁹ (73a) presupposes the existence of someone (so that there is a specific someone that is known, at least to some extent, to the speaker), while (73b) asserts it. The take-away from (73) is that the two sentences are not ambiguous so that, as argued by Diesing more generally, the scope facts of this section are read directly from overt syntax in German. As part of this, I conclude that the adverb *wieder* does not scramble, otherwise one of the word orders would be expected to allow both interpretations.

Next, consider *wieder* in a raising sentence:

- (74) a. weil was wieder dicht zu machen droht
 because what.NOM again dense to make threaten.3SG
 ‘because something threatens to close down again’
 b. weil wieder was dicht zu machen droht
 because again what.NOM dense to make threaten.3SG
 ‘because something threatens to close down again’

The first thing to note is that, given that there are two clauses, the adverb can be interpreted as modifying the full predicate *threaten-to-VP* and taking “high scope”, or as modifying the predicate contained in the infinitival and taking “low scope”. When the adverb takes high scope, it occurs in the matrix clause, as in (75a), while when it takes low scope, it occurs inside the infinitival, like in (75b).

- (75) a. [TP₁ ... ADV ... [TP₂ ... VP] threaten] ADV>R; *R>ADV
 b. [TP₁ ... [TP₂ ... ADV... VP] threaten] *ADV>R; R>ADV

In the high scope reading, the adverb (ADV) takes scope over the whole raising-predicate (*threaten-to-VP*, abbreviated to ‘R’ for raising). This reading corresponds to an interpretation where the threat of TP₂ coming about is being presupposed, so that what is understood to have previously occurred is merely the threat/risk/worry. In the low scope reading, the adverb scopes below the attitude of the raising verb, *i.e.* just over the predicate in the infinitival. In this reading, the lower predicate is presupposed, so that

⁴⁸ Relatedly, see footnote 10, and occasional discussion in section 2.1.1.

⁴⁹ The same contrast holds for the *wh*-indefinite when applying Diesing’s diagnostic: word order relative the particles *ja doch*.

in fact the content of TP2 is understood to have occurred before. The second thing to note about (74) is that both word orders, NOM>ADV and ADV>NOM, are possible on the surface. Importantly, however, one of the word orders is ambiguous, while the other is not.

With this in mind, consider the following facts for the word order NOM>ADV ((76b)=(74a)).

- (76) a. weil wer wieder zu kommen droht
 because who.NOM again to come threaten.3SG
 ‘because someone threatens to come again’ ADV>R; R>ADV
- b. weil was wieder dicht zu machen droht
 because what.NOM again dense to make threaten.3SG
 ‘because something threatens to close down again’ ADV>R; R>ADV

The sentences are ambiguous with regard to the adverb’s scope.⁵⁰ With the high scope reading, it is presupposed that there has been a prior threat or risk of someone coming or something closing down. With the low scope reading, there is now the risk that someone comes again or something closes down again; it is presupposed that someone has actually previously come, or that something has previously closed down. The ambiguity is expected given that the word order is compatible with both structures in (75) while respecting (i) raising, and (ii) *wieder* occurring where it is interpreted.

Crucially, the low scope reading disappears in the word order ADV>NOM. Consider the meaning of the following sentences ((77b)=(74b)).

- (77) a. weil wieder wer zu kommen droht
 because again who.NOM to come threaten.3SG
 ‘because someone threatens to come again’ ADV>R; ?*R>ADV
- b. weil wieder was dicht zu machen droht
 because again what.NOM dense to make threaten.3SG
 ‘because something threatens to close down again’ ADV>R; ?*R>ADV

In (77), only the high scope reading is available. The sentences cannot be interpreted in a way where the content of the infinitival is presupposed, *i.e.* known or supposed to have previously been true. For instance, while a question casting doubt on the presupposition that the threat or risk has occurred before is felicitous, a question casting doubt on the presupposition that the content of the infinitival has occurred before is infelicitous. Compare (78a)–(78b) against the backdrop of (77b) (or a version with verb-second; *Es droht wieder was dicht zu macht*).

- (78) a. Häh?! Bestand (hier) schon mal die Gefahr, dass was dicht
 huh was here already once the danger that something dense
 macht?
 makes
 ‘Huh?! Has there been the danger that something closes down (here) before?’
- b. #Häh?! Hat (hier) schon mal was dicht gemacht?
 huh has here already once something dense made
 ‘Huh?! Has something closed down (here) before?’

⁵⁰ They are not, however, ambiguous with regard to the interpretation of the indefinite, which is necessarily specific/presuppositional to my ear.

The unavailability of the low scope reading follows from the fact that there is raising. In fact, while the word order NOM>ADV is compatible with the subject being in the matrix clause, as schematized in (79), the word order ADV>NOM would force the subject to be contained in the infinitival whenever the adverb is also in the infinitival, as schematized in (80).⁵¹

- (79) a. [TP₁ NOM₁ ADV ... [TP₂ e₁ VP] threaten]
 b. [TP₁ NOM₁ ... [TP₂ ADV e₁ VP] threaten]
- (80) a. [TP₁ ADV NOM₁ ... [TP₂ e₁ VP] threaten]
 b. *[TP₁ ... [TP₂ ADV NOM₁ VP] threaten]

The facts above establish that the interaction of scope and word order with *wieder* in raising sentences are diagnostic of the clause boundary between the matrix clause and the embedded infinitival. Against this backdrop, consider how *wieder* can be interpreted in the context of *alles*:

- (81) a. *Was* droht **alles** wieder dicht zu machen?
 what.NOM threaten.3SG ALL again dense to make
 ‘What all is threatening to close again?’ ADV>R, R>ADV
- b. *Was* droht wieder **alles** dicht zu machen?
 what.NOM threaten.3SG again ALL dense to make
 ‘What all is threatening to close again?’ ADV>R, *R>ADV

(81a) can have a high and a low scope reading for *wieder*, while (81b) can only have a high scope reading. This would be surprising if it were possible for *alles* to be stranded inside the infinitival by A-movement. In a high scope reading, *alles* could be either in the matrix clause or in the embedded clause, as schematized in (82).⁵²

- (82) [CP WH-NOM₁ [C' threaten [TP₁ e₁ {*alles*} ADV (e₁) {*alles*} ... [TP₂ e₁ {*alles*} VP]]]]

In fact, the word order between *wieder* and *alles* is not generally constrained in subject questions:

- (83) *Was* macht {*alles*} wieder {*alles*} dicht?
 what.NOM make.3SG ALL again ALL dense
 ‘What all is closing down again?’

In the low scope reading, on the other hand, *wieder* is in the embedded clause. When *alles* precedes *wieder*, *alles* is either in the matrix clause, or in the embedded clause, as shown in (84a). However, when *alles* follows *wieder*, *alles* is necessarily in the embedded clause, too, which is exactly what is not possible in (81b). In other words, the derivation in (84b) must be prevented somehow.

- (84) a. [CP WH-NOM₁ [C' threaten [TP₁ e₁ {*alles*} ... [TP₂ e₁ {*alles*} wieder e₁ VP

⁵¹ Note that this is an argument for raising being obligatory in German, *contra* a claim made in passing in Reis (2005).

⁵² In order to derive the variable word order within a clause, it is either necessary to assume that *wieder* can adjoin at different heights, the highest attachment site being lower than the landing site of specific *wh*-indefinite subjects (see again (73a)), or that the word order *alles*>*wieder* is derived by an extra step of scrambling of *wh*+*alles* prior to the eventual step of *wh*-movement.

- b. $\left[\left[\left[\left[\left[\left[\text{CP } was_1 \right] \left[\text{C}' \text{ droht}_2 \right] \left[\text{TP}_1 e_1 \dots \left[\text{TP}_2 \text{ wieder } e_1 \text{ alles VP } \right] e_2 \right] \right] \right] \right] \right]$
 what.NOM threaten.3SG again ALL

If nothing prevents *wieder* from occurring low with this word order, then there is no way of excluding the unavailable low scope reading of (81b). If, on the other hand, *alles* were *not* able to occur in the tail of A-movement—and therefore raising in particular,—then it becomes clear why the low scope reading of (81b) is unavailable. The next position up the tree where *alles* can be stranded is the lowest link in the associate’s \bar{A} -chain. This link is in the matrix clause, in the landing site of raising. I repeat the schema from (72b):

- (85) $\left[\text{CP WH-NOM } \left[\text{TP } t_{wh} \{ \text{alles} \} \left[\text{VP } \left[\text{INF } t_R \{ * \text{alles} \} \text{ V } \right] \text{ threaten } \right] \right] \right]$

If *alles* is necessarily in the matrix clause of raising, then we can understand why the word order $\text{ADV} > \text{alles}$ forces *wieder* to also be interpreted in the matrix clause. It follows that only the high scope reading is available in (81b). (Similarly, I see no way to grant this conclusion while not equally preventing the derivation of the high scope reading in (84a) where *alles* is inside the embedded clause.) Finally, to complete the argument, note that the facts above warrant a conclusion about stranding in *A-chains* of infinitivals, and not merely about stranding in infinitivals *in general*. In fact, *alles* can be stranded inside the infinitival complement of raising verbs when the *wh*-question is an object question, see (86). In these cases, there is no (necessary) A-chain to strand *alles* on, and the sentences are acceptable.

- (86) a. Was_1 droht der Spiegel an der Wand $(e_1) \{ \text{alles} \}$ wieder
 what.ACC threaten.3SG the.NOM mirror on the wall ALL again
 $(e_1) \{ ? \text{alles} \} e_1$ der Königin zu sagen?
 ALL the.DAT queen to say
 ‘What all is the Mirror on the Wall threatening to say to the queen again?’
 b. Was_1 droht der Spiegel an der Wand [der Königin]₂ $(e_1) \{ \text{alles} \}$ wieder e_1
 $\{ \text{alles} \} e_2$ zu sagen?

The low scope reading is what matters here. To force that reading, the sentences in (86) can be understood in the context of a parent reading the story of Snow White to a child. In that context, given that the Mirror on the Wall says the hated words to the queen a few times in the story, when the parent is about to flip the page it makes sense to utter (86) with a low scope reading (“*Oh oh. . . (86)*”). Even in that context, *alles* is acceptable in the order $\text{ADV} > \text{alles}$ in (86). (While it is slightly marked in (86a), it is much better than in a subject question, and perfect in (86b) where the definite DAT is in its preferred scrambling position.)

Given that the assumption that the CLG for *alles* is restricted to the associate’s \bar{A} -chain makes the correct predictions in this domain, I conclude that the more narrow generalization in (5) is correct, and that *alles* indeed cannot be stranded by A-movement.⁵³

⁵³ Notice in connection with raising that the same pattern holds for control. For control, the clause boundary is transparently marked by the matrix-clause final verb. (ia) shows that with object questions out of the complement of subject control, *alles* can occur both in the matrix and in the infinitival; (ib) shows that with a *subject* question *alles* can no longer occur in the infinitival. There are two possible explanations. Either control is movement (Hornstein, 1999; Boeckx et al., 2010), so that *alles* again cannot occur in the A-trace position of the control A-chain. Or control involves PRO, but PRO lacks

5 Conclusion and Discussion

This paper argued that the floated quantifier in German known as “invariant *alles*” can and should be analyzed as a stranded quantifier rather than an adverb, by arguing for the Chain Link Generalization in (5), repeated here.

(87) *Chain Link Generalization for floated alles (CLG):*

Given a derivation, *alles* occurs in any position occupied by an \bar{A} -chain link of its associate.

Three kinds of argument were provided. First, *alles* and its associate have a common distribution: *alles* can occur where its associate can occur (base position, specific targets of scrambling, targets of raising, clause-medial stop-over sites of long-distance *wh*-movement), and it *cannot* occur where its associate *cannot* occur (Wackernagel position to the left of weak pronouns, “wrong” base positions). That is, extending work by Reis (1992), the distribution of *alles* is shown to be relative to the distribution of the associate in a given derivation. Second, the distribution of *alles* makes reference not only to properties of its associate, namely that the associate be a certain kind of \bar{A} -operator, but also to properties of the associate’s chain. Floated *alles* is shown to be further restricted to the \bar{A} -chain of its associate based on Anti-A-trace effects in weak cross-over, superiority, Case, and raising configurations. This finding is in line with an emerging generalization in the literature that *wh*-quantifier float is restricted to positions occupied by the associate’s \bar{A} -chain links (McCloskey, 2000; Fitzpatrick, 2006). Third, *alles* can induce effects of unacceptability and losses of interpretation where overt instances of its associate can do the same. The effects argue that sentences with floated *alles* are necessarily assigned a derivation such that the associate occupied the position marked by *alles* at some stage in the derivation—crucially, in these configurations, at a stage in the derivation where the presence of the associate causes the derivation to crash. Overall, the informal generalization corresponding to the CLG is that *alles* “lives on chains”, specifically on its associate’s \bar{A} -chain. A stranding analysis of *alles* float where *alles* and the associate form a first-merge constituent follows as the only *explanation*.

Finally, the facts that make up the CLG in turn have two broader consequences. For one, long-distance *wh*-movement is to be understood as proceeding in successive-cyclic steps through a clause-medial projection in German. The facts suggest that this projection is vP so that, in term of Phase Theory, (transitive) v is a strong phase in the sense of Chomsky (2001) (and, for instance, contra Keine, 2017). The second consequence is for the understanding of Scrambling in German. The facts making up the narrow CLG that is restricted to \bar{A} -chain links suggest that scrambling is always A-movement.

the relevant features that *alles* selects for so that low *alles* in (ib) is unacceptable for the same reason that *alles* cannot occur in the tail of topicalization.

- (i) a. (Und) *wen*₁ hat [die Maria]₂ {**alles**} versucht, [INF *PRO*₂/*e*₂ dem Peter
and who.ACC have.3SG the.NOM Maria ALL tried the.DAT Peter
*e*₁ {**alles**} vorzustellen] ?
ALL to.introduce
‘(And) who all did Maria try to introduce to Peter?’
- b. (Und) *wer*₁ hat *e*₂ {**alles**} versucht, [INF [dem Peter]₂ *PRO*₁/*e*₁ {***alles**} *e*₂ die Susi
vorzustellen] ?
and who.NOM have.3SG ALL tried the.DAT Peter ALL the.ACC Susi to.introduce
‘(And) who all tried to introduce Susi to Peter?’

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