

The Nominal Left Periphery in German: Abstract and Overt Agreement Chains

Dorian Roehrs, UNT

As is well known, concord holds between different nominal elements of the noun phrase. This paper identifies two additional processes that explain some grammaticality contrasts in the nominal left periphery of German. On the one hand, an abstract agreement chain is built in syntax that must exclude (possessive) genitive features. On the other, a type of phonotactic chain is formed in PF. It will be shown that the DP-layer plays an important role if an element is in the left periphery. First, these chains only manifest themselves in the DP-layer. Second, the DP-level preferably contains an overt element and it attracts elements (*alle* ‘all’, *beide* ‘both’) that have a choice of where to structurally merge.

1. Introduction

Based on similar data in Haider (1988, 1992), Bayer (2015) discusses the following grammaticality contrast in German where a possessive determiner or a Possessor Doubling construction can be preceded by inflected *alle* ‘all’ (1a-b) but not a Saxon Genitive (1c):¹

- (1) a. alle ihre Bücher
 all-INFL her-INFL books
 ‘all her books’
 b. alle der Maria ihre Bücher
 all-INFL the.DAT Mary her-INFL books
 ‘all Mary’s books’
 c. * alle Marias Bücher
 all-INFL Mary’s books
 ‘all Mary’s books’

Assuming *der Maria* ‘(the) Mary’ to be in Spec,DP, Bayer argues that this yields an uninterrupted agreement chain in (2a) such that all relevant elements participate in concord of the noun phrase. This is indicated by +AGR. In contrast, the chain in (2b) is disrupted by *Marias*, which does not share features with the remaining elements. Bayer (2015) proposes that the disruption of the agreement chain in (2b) leads to ungrammaticality:²

¹ The example in (1b) is provided with Bayer’s judgements. There are two differences for me: While for him, the proprial article *der* is obligatory, it is not for me. In fact, its presence leads to a marked example here. Having said that, even in the absence of *der*, the example is still slightly marked for me. I return to this degradedness in section 3. On a different note, I gloss definite articles differently from other elements. Although they also agree with their head noun in features, they are monosyllabic; that is, the agreement inflection does not make up a second syllable. This will become relevant later in the paper.

² As mentioned by Bayer (2015), the notion of agreement chain goes back to early work by Olsen (e.g., Olsen 1989a). I return to this in section 2.2.

- (4) a. all ihre Bücher
all her-INFL books
'all her books'
- b. ?? all der Maria ihre Bücher
all the.DAT Mary her-INFL books
'all Mary's books'
- c. * all Marias Bücher
all Mary's books
'all Mary's books'

Considering *all* vs. *alle*, the agreement chain proposed by Bayer cannot be about overt inflection in the left periphery as the same facts hold for uninflected *all*. The question arises if this agreement chain involves some kind of abstract agreement.

As it turns out, this agreement chain cannot be about agreement in the left periphery at all. There is a construction not discussed by Bayer (2015) that involves a preposed PP (5a). Importantly, PPs do not share agreement features with the rest of the nominal. Furthermore, note already here that there is also no overt inflection on *sein* 'his' in (5b). Independent of these two facts, the same contrast holds where a possessive determiner is fine (5b) but a Saxon Genitive is not (5c) (data is taken from Haider 1992: 315; for (5c), see also Fortmann 1996: 22):

- (5) a. aus Jena der Anruf
from Jena the.NOM call
'the call from Jena'
- b. aus Jena sein Anruf
from Jena his call
'his call from Jena'
- c. * aus Jena Peters Anruf
from Jena Peter's call

To reiterate, it is clear that there is no disruption of an agreement chain by *Peters* in (5c) as the preposed PP does not participate in agreement in the first place. Still, the example is ungrammatical. This means that the notion of agreement chain needs to be refined.

Indeed, as already seen in (5b) above, the agreement chain cannot be about overt inflection on an element in the DP-layer either. This extends to other elements that may occur without overt inflection, the indefinite article provided below as *'n* and the singularity numeral provided as *EIN*:

- (6) a. von Peter 'n Freund
of Peter a friend
'a friend of Peter's'
- b. (?) von Peter EIN Freund
of Peter one friend
'one friend of Peter's'

In other words, the absence of agreement inflection here does not necessarily lead to degradedness either. To be clear, then, while the Saxon Genitive *Marias* leads to

ungrammaticality, the uninflected possessive determiner *sein*, the indefinite article *'n*, or the numeral *EIN* do not. Importantly, the latter three pattern like inflected *seine*, *'ne*, and *EINE*:

- (7) a. von Peter seine Autos
 from Peter his-INFL cars
 'his cars from Peter'
 b. von Peter 'ne Freundin
 of Peter a-INFL girlfriend
 'a girlfriend of Peter's'
 c. (?) von Peter EINE Freundin
 of Peter one-INFL girlfriend
 'one girlfriend of Peter's'

Focusing on nominative case, the complete set of these elements in the masculine, neuter, feminine, and plural is given in (8). Note that in ellipsis contexts, the masculine and neuter forms have an inflection provided in parentheses in (8a-b) (for recent discussion, see Murphy 2018). In the feminine and plural, these inflections are obligatory, independent of ellipsis (8c-d):⁴

- (8) a. masculine: sein(er), ein(er), EIN(ER)
 his-INFL, an-INFL, one-INFL
 b. neuter: sein(es), ein(es), EIN(ES)
 his-INFL, an-INFL, one-INFL
 c. feminine: seine, eine, EINE
 his-INFL, an-INFL, one-INFL
 d. plural: seine, eine
 his-INFL, so many-INFL

Given these inflections, it is clear now that these elements agree with their head noun albeit not overtly in every case.

To sum up, as demonstrated above, the agreement chain postulated by Bayer (2015) cannot be about agreement with the leftmost element (*von Peter*) and it cannot be about overt inflection on the following determiner (*sein*, *ein*).

2.2. Proposal

Preposed PPs and Saxon Genitives are possessives that do not agree with the head noun in phi-features and case. In other words, they do not participate in concord within the noun phrase. As discussed in detail in Roehrs (to appear b), there is a clear difference between these elements in that the former requires the presence of an article but the latter does not allow it:

- (9) a. von Peter *(das) Buch
 of Peter the book
 'the book of Peter's'

⁴ Traditionally, these elements are called *ein*-words. To make their relatedness clearer, I provide the indefinite article here as the unreduced form *ein*, rather than *'n*. Also, note that plural *eine* occurs only in very colloquial, emotive contexts (e.g., *eine Störche* 'so many storks', see Roehrs 2012).

- b. Peters (*das) Buch
Peter's the book
'Peter's book'

In fact, preposed PPs tolerate another element (*all*) to intervene:

- (10) a. (?) von Peter all die Bücher
of Peter all the.NOM books
'all the books of Peter's'
- b. * Peters all(e) Bücher
Peter's all-INFL books

This provides strong evidence that the two types of possessives are in different positions: *von*-phrases are above the DP-layer but Saxon Genitives are determiner-like elements inside the DP-level. In other words, preposed PPs are in – what I call – the left periphery. This immediately explains why (9b) is independently out. Structurally, Saxon Genitives occur in the DP-layer and are in complementary distribution with the determiner.

Interestingly, cases in the plural yield marked results for preposed PPs but not for Saxon Genitives:

- (11) a. ?? Von Peter Bücher sind billig.
of Peter books are cheap
'Books of Peter's are cheap.'
- b. Peters Bücher sind billig.
Peter's books are cheap
'Peter's books are cheap.'

Most likely, cases like (11a) are not degraded due to indefiniteness as the presence of an indefinite article yields a perfect example in the singular (see (6a) above). If a numeral or adjective is added, the examples seem to improve somewhat (cf. also (6b)):

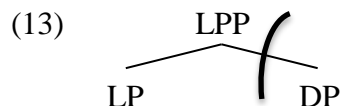
- (12) a. ? Von Peter drei Bücher sind billig.
of Peter three books are cheap
'Three books of Peter's are cheap.'
- b. ? Von Peter alte Bücher sind billig.
of Peter old-INFL books are cheap
'Old books of Peter's are cheap.'

If this is indeed so, then we can state that the absence of an overt element in the DP-layer leads to degradedness if an element is in the left periphery. However, that degradedness is mitigated if a lower element such as a numeral or adjective is present. This suggests two points: on the one hand, the DP-layer plays an important role in that it preferably contains an overt element (cf. Longobardi 1994, Cirillo 2016 and references cited therein); on the other, the agreement chain preferably contains (at least) one overt link above the head noun.⁵ Note that if this holds up, then

⁵ The following contrast between (ia) and (ib) could potentially fall under the same explanation. Comparing (ia) and (ib) to (ic), it seems clear that uninflected *all* can only occur preceding a determiner. This means that *all* in (ib) is

the contrast in (11a-b) provides a second argument that preposed PPs and Saxon Genitives are indeed in different positions.

With this in mind, I propose that there are two domains in the noun phrase relevant for this phenomenon, the DP proper and the left periphery. Following Giusti & Iovino (2016), I will call the latter the Left Periphery Phrase (LPP):



Following standard assumptions, the DP-layer is the level hosting determiners and determiner-like elements: definite and indefinite articles are in D but demonstratives, possessive determiners, and Saxon Genitives are in Spec,DP.⁶ Linguistic units preceding those elements are taken to be in LPP making up the left periphery (e.g., PPs and certain cases of *alle*). It will be shown that the DP-level plays an important part in explaining this phenomenon.

I make a difference between a covert/abstract and an overt/phonotactic chain (the latter is discussed in section 3). Recalling the data involving preposed PPs, I propose *pace* Bayer (2015) that an (abstract) chain does not start in the left periphery but lower in the structure. This can be formulated as follows:

(14) *Generalization #1:*

If a linguistic unit is in the left periphery, the determiner(-like) element must agree with the head noun.

In other words, if there is an element above the DP-layer, then the element inside the DP-layer must agree with the head noun in phi-features and case. For expositional purposes, we can state that an element in the left periphery “activates” or “triggers” the formation of an agreement chain inside the DP but does not have to participate in it. I will refer to the starting point of the chain, the element in the DP-layer, as the head of the chain. To be clear, I make a difference between the trigger and the head of the chain.

In order to explain concord inside the DP, Olsen (1989a: 45) proposes that couched in current terminology, D functionally selects NP such that an uninterrupted chain of identical superscripts from D to N is established. Furthermore, an agreement chain is made visible by overt concord on all lexical heads (if possible). Like in Olsen, the current phenomenon also

presumably in the left periphery. With the DP-layer not overt in (ib), this could explain the ungrammaticality of the example (see section 2.3 on the differences of *all(e)* as a pre-determiner or determiner):

- (i) a. alle Bücher
all-INFL books
'all books'
- b. * all Bücher
all books
- c. all die Bücher
all the.NOM books
'all the books'

However, the grammaticality contrast is stronger. Thus, more needs to be said here (see Cirillo 2016: 199ff, who proposes that *-e* on *alle* is a determiner-like element).

⁶ With some elements in D and others in Spec,DP, their complementary distribution cannot be a simple positional account (see Roehrs to appear a).

shows a directionality going from left to right. Unlike in Olsen, the current discussion has highlighted the fact that the trigger of the chain is different from the head of the chain.

Haider (1988) proposes that *all* is in Spec,DP. Assuming that the possessive determiner is in D but the Saxon Genitive is in Spec,DP, this immediately explains why Saxon Genitives cannot cooccur with *all*. There are two issues with this simple account: On the one hand, we have seen that preposed PPs are in a higher position. This means that the ungrammatical cases involving a Saxon Genitive and a preposed PP cannot be explained by complementary distribution. On the other, there is evidence that *all* is actually in a higher position (*alle diese meine Freunde* ‘all these friends of mine’, see below).

The trigger of the chain might be interpreted as follows. Considering that the head of the chain is to the right of the trigger, I will claim that the head LP in (13) selects an “agreeing” DP in a sense to be made more precise below. LP is the head in the specifier of which sits – what I call here – the trigger. I will make use of well-established mechanisms like selection and Spec-head agreement. Starting with the latter, Spec-head agreement is well known from Definiteness Spread where the interpretation of a possessive DP depends on the definiteness of the possessor itself:

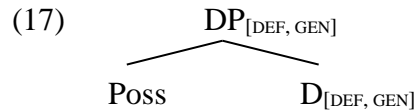
- (15) a. * There was John’s book on the table.
 b. There was a man’s dog in the garden.

According to Alexiadou (2005), this straightforwardly holds in English (but is different in Hebrew and Greek). German is like English. Assuming the possessor to be in Spec,DP, Spec-head agreement makes D and thus DP as a whole definite. What has not been discussed in much detail is what happens to the case feature on the element in Spec,DP. Traditionally, possessives are taken to be in the genitive. In German, pronominal possessives can typically not be complex (16a). With case usually marked on the determiner in German, this feature cannot easily be inspected in this construction.⁷ However, there are some isolated examples where complex possessives are not impossible (16b), including some fossilized phrases (16c). These cases clearly show genitive:

- (16) a. (??des) Peters Auto
 the.GEN Peter’s car
 ‘Peter’s car’
 b. (?) meines Vaters Auto
 my.GEN father’s car
 ‘my father’s car’
 c. des Kaisers neue Kleider
 the.GEN emperor.GEN new clothes
 ‘the emperor’s new clothes’

⁷ It is a controversial issue as to whether or not possessive ‘s indicates genitive or a possessive relation. For instance, it is often claimed that ‘s is genitive in German (Cirillo 2016: 193ff) but not in English (Alexiadou 2005: 794ff).

Now, if definiteness undergoes Spec-head agreement, so should genitive. In other words, D (and thus DP) agrees with the possessive in definiteness and case. Consequently, there are at least two features on DP: definiteness and genitive features:⁸



Thus far, the Spec-head agreement with regard to the genitive and its consequences have not received much attention as any effects seem to remain invisible in the transition from the nominal to another domain; that is, when a DP is selected by a verb, a preposition, an adjective, or a(nother) noun.⁹ However, I believe that this is different inside the nominal domain, specifically in the transition from the DP to the left periphery. Here, this issue becomes visible through the data discussed above. Adding LPP on top of DP, there are four options with regard to the genitive (leaving aside other features).

First, given the Spec-head relation in (17), genitive is on DP. It is then “passed up” to LP and thus to LPP. To instantiate this, one could propose that LP and DP must match in the same features:¹⁰

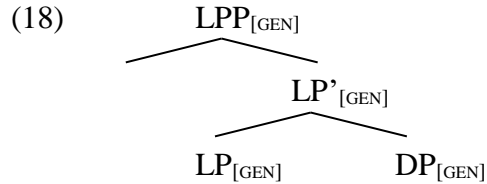
⁸ There is also debate on where genitive is assigned/checked in the noun phrase. Abney (1987), Haider (1988, 1992), and Olsen (1989b) claim it is in Spec,DP; Alexiadou (2005: 791) and Cirillo (2016: 188) argue it is below the DP-level. For the following account to go through, the genitive feature must appear on DP, be it assigned/checked in the DP-layer or “passed up” to that level. Furthermore, there are also regular concord features including case in the noun phrase. For some reason, the (concord) case feature does not clash with the (possessive) case feature. One could suggest that these two types of features are part of two different feature bundles that do not interact with one another. Note that this issue holds independently of where genitive is assigned/checked.

⁹ At first glance, one may think that the difference between possessive determiners and Saxon Genitives also holds in the transition from DP to a higher N ((ia-b) are from Haider 1992: 330). However, the example is also ungrammatical if the prenominal element is missing, be it in the singular or plural (ic):

- (i) a. die Eröffnung seines Geschäfts
the opening his-GEN store-GEN
‘the opening of his store’
b. * die Eröffnung Peters Geschäfts
the opening Peter’s store-GEN
‘the opening of Peter’s store’
c. * die Eröffnung Geschäfts/Geschäfte
the opening store-GEN/stores.GEN
‘the opening of store/stores’

One may argue that the example in (ic) involving a singular count noun is ungrammatical because a determiner is missing. However, this is different for plural nouns, which do not require a determiner. That (ic) is also ungrammatical in the plural indicates that nouns in the genitive in German are subject to an independent requirement, namely they must be preceded by an element that displays a genitive ending in concord with the head noun. This is the case in (ia) but not in (ib) (for detailed discussion, see Gallmann 1997). If this is so, then the contrast in (ia-b) has nothing to do with a higher selecting head (unlike in the main text).

¹⁰ Following Haider (1988: 52), we could suggest that functional heads select features for which they themselves are specified. Alternatively, we could state that LP undergoes agreement with DP.



So far, so good. We know that examples involving only Saxon Genitives on the left are fine (19a). In order to rule out the ungrammatical cases (19b), one could propose that it is not the Saxon Genitive that causes the problem but rather the element merged in LPP. In particular, one could claim that PPs and *alle* cannot be merged in LPP if the latter has a genitive feature:

- (19)
- a. Peters Anruf aus Jena
Peter's call from Jena
 - b. * aus Jena Peters Anruf
from Jena Peter's call

One could suggest then that this restriction also follows from Spec-head agreement, now holding in the LPP-level (I return to this suggestion below).

Perhaps surprisingly, two genitives in prenominal position are also ungrammatical (20b):

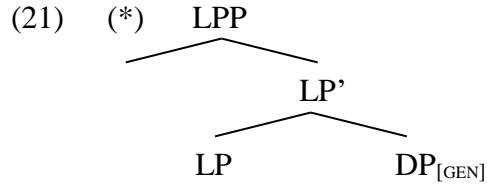
- (20)
- a. Cäsars Eroberung der Gallier
Caesar's conquest the.GEN Gauls
 - b. * der Gallier Cäsars Eroberung
the.GEN Gauls Caesar's conquest

Given Definiteness Spread, I propose that the genitive phrase has to move through Spec,DP to check the definiteness feature on D. However, the Saxon Genitive already occupies Spec,DP. This rules out (20b). Note also that PPs do not have to move through Spec,DP as they have nothing to do with definiteness (for details, see Roehrs to appear b).

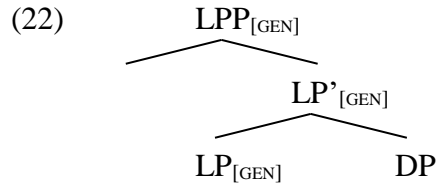
While not implausible, this matching account of LP and DP raises some issues. On the one hand, the selecting head and its complement must share the same features. Note though that this is not a typical structural configuration for agreement. On the other, a PP must be prevented from surfacing in Spec,LPP by a feature in LP. Notice though that this is a kind of “head-Spec agreement” – the reverse of the regular Spec-head agreement. Typically, the specifier controls agreement features of the head and not vice versa (cf. subject-verb agreement). Alternatively, one may suggest that the head LP assigns/checks genitive case features in its specifier. However, this cannot be true either as *alle* shares concord features with the lower part of the nominal.

A simpler and more straightforward account involves selection where the selectee, the complement, must satisfy the selectional requirements of the selector, the head (and not vice versa; see Chomsky 2000: 133). On this assumption, we can simply claim that a DP with a (possessive) genitive feature on it does not satisfy the selectional requirements of LP. This rules out the above derivation altogether.

Second, if the selectional restriction above is accepted, it also rules out the following derivation:



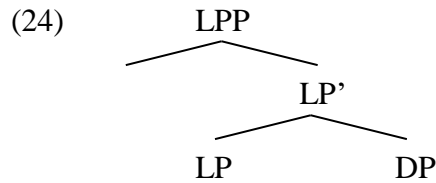
As a third option, one could expect instances where the genitive is only on LPP:



While the selectional requirements of LP are met, a genitive element in LPP is out for the same reason as in the first option – this element has to move through Spec,DP, which is already filled with a definite element, here the possessive determiner:

- (23) a. seine Eroberung der Gallier
 his conquest the.GEN Gauls
 b. * der Gallier seine Eroberung
 the.GEN Gauls his conquest

Finally, I turn to cases where no genitive is present:



This type of derivation is fine and it explains the grammaticality of all the cases that lack Saxon Genitives. There are some interesting consequences of this proposal.

While this paper focuses on German, the current analysis straightforwardly explains the main set of cross-linguistic data under investigation in Cirillo (2016). We have seen above that Saxon Genitives cannot intervene between *all(e)* and the lower part of the nominal in German. This is different for English and Dutch where they can:

- (25) a. all John's friends
 b. al Jans vrienden (Dutch)
 all Jan's friends
 'all John's friends'

Since English and Dutch do not have (morphological) genitive case, LP can easily select DP explaining the grammaticality of these examples.

Furthermore, note also that a selecting head that is incompatible with a genitive feature immediately explains the grammatical cases involving quantifier float (26a). Assuming with Bošković (2004) that the floating quantifier is merged acyclically as left adjunction to DP (26b), the lower DP can move up stranding the quantifier in its position in (26a):

- (26) a. Peters Freunde sind alle gekommen.
 Peter's friends are all-INFL come
 'Peter's friends have all come.'
 b. [DP alle [DP Peters [NP Freunde]]]

Since adjunction does not involve a selecting head, the base structure in (26b) is fine and the derivation can proceed successfully.

Taking stock, selection and Spec-head agreement rule out Saxon Genitives as heads of the agreement chain in German. Crucially, the phenomenon only manifests itself in the DP-layer and only if the left periphery is filled. These facts follow from the presence of LP and its selectional requirements. Furthermore, the account has to do with the transition from DP to LPP. The establishment of an agreement chain starting in DP is a byproduct of LP selecting DP. Specifically, the DP will agree in all features with the lower part of the nominal by regular concord mechanisms.¹¹ For expositional ease, I will continue to use the terminology above.

There are more cases falling under Generalization #1. First, like *alle*, *diese* 'these' can also precede a DP:

- (27) a. diese seine Freunde
 these-INFL his-INFL friends
 'these friends of his'
 b. * seine diese Freunde
 this-INFL these-INFL friends

In fact, given some ordering restrictions, both *alle* and *diese* can precede a DP:

- (28) a. alle diese seine Freunde
 all-INFL these-INFL his-INFL friends
 'all these friends of his'
 b. ?? diese alle seine Freunde
 these-INFL all-INFL his-INFL friends
 c. * diese seine alle Freunde
 these-INFL his-INFL all-INFL friends

¹¹ Actually, although not visible with preposed PPs, the inflection on *alle* shows that the concord chain extends all the way to LPP. Consider the following example in the dative:

- (i) a. mit [LPP all-en [DP dies-en [NP Leute-n]]]
 with all-DAT these-DAT people-DAT
 b. phi+case phi+case phi+case
 (*GEN)

It is the intervening (possessive) genitive feature, if present, that causes the ungrammaticality.

As in the cases above, if the possessive determiner is replaced by a Saxon Genitive, ungrammaticality results (examples improve with a pause between *diese* and *Peters*, which presumably involves an appositive construction):¹²

- (29) a. ?* diese Peters Freunde
 these-INFL Peter's friends
 b. * alle diese Peters Freunde
 all-INFL these-INFL Peter's friends

If this falls under the same generalization and account, then it implies that there is a selecting head LP; that is, *diese* is not adjoined to DP.

Second, the account might be extendable to another case pointed out by Haider (1988: 53):

- (30) a. fast sein ganzes Einkommen
 almost his entire income
 'almost his entire income'
 b. ? fast Peters ganzes Einkommen
 almost Peter's entire income
 'almost Peter's entire income'

As above, an element is in the left periphery (*fast*). It is not entirely clear though why the grammaticality contrast between (30a) and (30b) is less sharp than in the cases discussed earlier. This could imply that this is a different type of case after all (Haider 1988 suggests that *fast* is adjoined to DP).

2.3. Structural Components of the Proposal

Perhaps unexpectedly, the judgements are reversed in coordinations such that (non-agreeing) Saxon Genitives are fine but (agreeing) articles are not (data taken from Bhatt 1990: 142):

- (31) a. alle meine und Peters Bücher
 all-INFL my-INFL and Peter's friends
 all mine and Peter's friends'
 b. * alle meine und die Bücher
 all-INFL my-INFL and the.NOM friends

The data find an explanation in the current context by assuming that the agreement chain holds only within one conjunct of the coordination. This explains the grammaticality with Saxon Genitives as no chain is established – there is simply no element in the left periphery of the second conjunct. As for (31b), if the article is replaced by a demonstrative, the examples are fine

¹² To explain the contrast between (27a) and (28a) vs. (29a-b), Bhatt (1990: 217-218) claims that *alle*, *diese*, and *seine* are heads. She proposes that *alle* is adjoined to *diese* and the resulting complex is adjoined to *seine*. The entire complex is inside Spec,DP. Bhatt claims that the three determiners can undergo head-to-head agreement. This is not possible with Saxon Genitives in (29) as the latter do not have inflections. Note though that head-to-head agreement is not a commonly accepted operation.

(32a). Note that if the article is stressed, indicated below by capitalization, it functions as a demonstrative in German and the examples are grammatical too (32b-c):¹³

- (32) a. alle meine und diese Bücher
 all-INFL my-INFL and these-INFL friends
 ‘all mine and these friends’
- b. alle meine und DIE Bücher (da)
 all-INFL my-INFL and those.NOM friends (there)
 ‘all mine and these friends (there)’
- c. DIE and alle meine Bücher
 those.NOM and all-INFL my-INFL friends
 ‘these and all my friends’

There are two ways to explain the ungrammaticality in (31b) above. First, the definite article in (31b) seems to “pick out” the referent made salient by *alle meine* in the first conjunct; that is, the two conjuncts “pick out” the same referent. This presumably leads to a semantically ill-formed coordination. Second, considering that demonstratives involve stress, one could state that both conjuncts need to be similar in terms of heaviness, something that does not hold when an article is in one conjunct and more elements are in the other. Whichever option turns out to be true, there is an independent explanation for the ungrammatical (31b). Importantly, the formation of an agreement chain is sensitive to structure.

There are other structural considerations relevant for the creation of a well-formed agreement chain. In the introduction, we have seen that the possessor of the Possessor Doubling construction does not disrupt the agreement chain (33a). It is as if the possessor were invisible. Other items seem to be irrelevant as well. Specifically, certain predeterminers show a behavior similar to those of possessors (33b). The same goes for arguments of adjectives, which are below the DP-layer (33c). These elements are put in square brackets:¹⁴

- (33) a. alle [(dem) Peter] seine Bücher
 all-INFL the.DAT Peter his-INFL books
 ‘all Peter’s books’
- b. von Peter [so manch] ein Freund
 of Peter so some a friend
 ‘some friends of Peter’s’
- c. alle die [auf den Sohn] stolzen Väter
 all-INFL the.NOM of the.ACC son proud-INFL fathers
 ‘all the fathers proud of their sons’

It is important to observe that these bracketed elements depend on the presence of the word on their right. In other words, the possessor cannot occur without the possessive determiner, the predeterminer requires the presence of the indefinite article, and the PP-argument cannot show up without the adjective. The reverse does not hold meaning that the word on the right can occur

¹³ Unstressed *die* does not occur by itself. In other words, *die* in (32c) must involve a demonstrative.

¹⁴ The example (33c) involving an adjective is provided for completeness’ sake only. In section 4, we will see that adjectives and numerals do not actively participate in the formation of a chain (other than constituting an overt link in the chain).

alone. We can conclude that the elements in brackets are syntactically optional. However, considering their dependency, these optional elements seem to form a unit with the word on their right. If one were to assume that the word on the right projected a complex phrase of its own, these optional elements could be taken to be embedded in those phrases. As such, these elements would not participate in an agreement chain in the matrix nominal and would not be expected to disrupt it.

Third, I consider the possible positions of *alle* ‘all’ and *beide* ‘both’. Let us return to the data from the introduction:

- (34) a. * alle Marias Bücher
 all-INFL Mary’s books
 ‘all Mary’s books’
 b. * beide Marias Bücher
 both-INFL Mary’s books
 ‘both Mary’s books’

Taking the data at face value, one could be inclined to give them the same analysis. In fact, Bayer (2015) tentatively suggests just that, namely that the Saxon Genitive disrupts an agreement chain in (34b) just as it does in (34a). However, as also pointed out in the introduction, *beide* does not behave like *alle* in all other respects:

- (35) a. * Marias alle Bücher
 Mary’s all-INFL books
 b. Marias beide Bücher
 Mary’s both-INFL books
 ‘both Mary’s books’

In what follows, I will argue that (34b) is independently out and its ungrammaticality has nothing to do with the disruption of an agreement chain.

Let us consider the positional options of *alle* and *beide* in more detail. Here I provide English examples again, which will make the point under discussion clearer. Starting with English, *all* must precede determiners (36) to the extent determiners are present (37):¹⁵

- (36) a. all his books
 b. all these books
- (37) a. all books
 b. * the all books

The same facts hold for German (ST = strong ending, WK = weak ending):

¹⁵ This is not a universal requirement as Yiddish allows (37b):

(i) di ale tayere zakhn
 the all expensive things
 ‘all the expensive things’
 (Olsvanger’s *Röyte pomerantsen*; story 150, page 97)

- (38) a. all(e) seine Bücher
all-INFL his-INFL books
'all his books'
b. all(e) diese Bücher
all-INFL these-INFL books
'all these books'
- (39) a. all*(e) Bücher
all-INFL books
'all books'
b. * die alle(n) Bücher
the.NOM all-INFL.ST(/.WK) books

It is interesting to note that the inflection on German *alle* is optional when a possessive determiner or demonstrative is present (38a-b) but obligatory when a determiner is absent (39a). Given this difference in inflections, let us assume that there are two different positions for English *all* and German *all(e)* (cf. footnote 5):

- (40) LPP DP
all all (English)
all(e) alle (German)

Thus far in the discussion, English and German are basically the same. However, these two languages differ as regards *both* and *beide*.

Similar to *all*, English *both* can occur before a determiner (41a-b), it can be the determiner itself (42a), but it cannot follow the determiner (42b):¹⁶

- (41) a. both his friends
b. both these friends
- (42) a. both books
b. * the both books

This is different for German *beide*. Notice that *beide* cannot precede a determiner (weak endings on the possessive or the demonstrative make the examples worse).¹⁷

- (43) a. ?? beide seine(?n) Bücher
both-INFL his-INFL.ST(/.WK) books
b. ?? beide diese(?n) Bücher
both-INFL these-INFL.ST(/.WK) books

¹⁶ There is a data point gleaned from the TV sitcom *Everybody loves Raymond*, which has *both* following the definite article:

(i) the both of you

Crucially though, there is no overt noun after *both*. This shows that ellipsis contexts allow other possibilities implying a different syntax.

¹⁷ Vater (1991:18) judges *beide diese Bücher* as fine. However, I side with Bhatt (1990: 217), who finds these types of example degraded.

However, *beide* can easily follow a determiner:

- (44) a. seine beiden Bücher
 his-INFL both-INFL books
 ‘both his books’
 b. diese beiden Bücher
 these-INFL both-INFL books
 ‘both these books’

These two data points make German *beide* different from English *both*. As perhaps expected, German *beide* can also be the determiner itself. Like other determiners, it triggers a weak ending on a following adjective (45a-b). Furthermore, we already observed that *beide* has to follow a determiner if there is one. In fact, if *beide* follows a determiner, it behaves like a regular adjective in that it takes a weak ending (45c):

- (45) a. beide kleinen Bücher
 both-INFL small-INFL.WK books
 ‘both small books’
 b. ?? beide kleine Bücher
 both-INFL small-INFL.ST books
 c. die beiden kleinen Bücher
 the.NOM both-INFL.WK small-INFL.WK books
 ‘both the small books’

We conclude that besides a determiner, *beide* can also be an adjectival element in German.

To sum up thus far, there are three positions for *both/beide*. Consider (46). On the one hand, none of the two languages tolerates all three positional options. On the other, both languages share the option of DP but they differ in the second option in that English *both* can occur above the DP-level but German *beide* below it:

- (46) LPP DP CardP
both both (English)
beide beiden (German)

Comparing (40) to (46), English *all* and *both* have the same distributional options but German *all(e)* and *beide* do not. Continuing with German, we may state that if *alle* or *beide* is present, they surface in the DP-level unless a determiner forces them to be higher (*alle*) or lower (*beide*). Presumably, both elements share the option of the DP-layer as definite DPs require an overt element in the DP-level (Longobardi 1994 and Cirillo 2016). Again, the DP-layer plays an important part in German.

The different positions of *alle* and *beide* in German are confirmed by other facts. In this language, both elements can cooccur provided *beide* is the adjectival version (the weak ending *-n* added to *beide* in (47a) makes the example perfect):¹⁸

¹⁸ The two analyses for (47a) are as follows:

(i) a. ? [LPP alle [DP beide [NP Bücher]]]

- (47) a. alle beide[?](n) Bücher
all-INFL both-INFL.ST(/.WK) books
‘both (of the two) books’
b. * beide alle(n) Bücher
both-INFL all-INFL.ST(/.WK) books

English disallows both elements to occur at the same time:

- (48) a. * all both books
b. * both all books

We are now ready to return to the data above. With *Marias* in Spec,DP, it is clear that *beide Marias Bücher* is independently out as *beide* cannot appear in LPP (cf. (46)). In other words, the ungrammaticality of this example is not an argument for an agreement chain, an extension cautiously suggested by Bayer in his proposal.

The upshot of this discussion is that the possible structural positions of elements have to be taken into account in the discussion of agreement chains. In fact, it has become clear that cross-linguistically, quantifiers can be in different positions in different languages. Besides the DP-layer, they can also be above the DP-layer (English *both*; also Icelandic *margar* ‘many’, see Pfaff 2015: 84; and Old English *sum*, see Roehrs & Sapp 2018) or below the DP-layer (German *beide*; also Early New High German *alle* and Yiddish *ale*, see Roehrs & Sapp 2016: 144). Note that these positions seem to be independent of the inflection on the quantifier.

3. Overt Agreement Chains

In this section, I turn to the second type of agreement chain. I provide more data, I briefly speculate on an explanation, and finally I turn to an additional requirement on the formation of this type of chain.

3.1. Data, Generalization, and Proposal

As argued above, not all cases discussed this far can be explained by the disruption of an agreement chain in the sense of Bayer (2015). Rather, they all have to do with the appropriate head of a chain provided a chain is formed. As seen above, an abstract chain starts at the DP-level although the trigger of that chain, the selector, is in the left periphery. Interestingly, there are indeed cases where the disruption of an agreement chain leads to degradedness. These cases involve *overt* agreement chains, which I turn to next. Like abstract chains, overt chains manifest themselves only in the DP-layer and only under certain conditions. Unlike abstract chains, overt chains start with the first element on the left; that is, the trigger and the head of the chain form the same element.

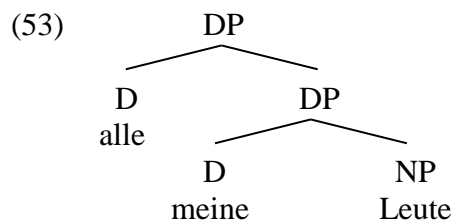
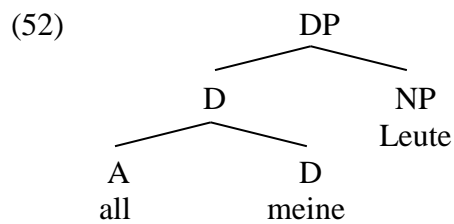
b. [DP alle [_{CardP} beiden [_{NP} Bücher]]]

Note though that if (ia) is possible, it is not clear why the following is bad: **all beide Bücher* (cf. *all diese Bücher*).

As noted above, both German *all* and *alle* can appear before elements such as possessive determiners (49) or demonstratives (50). There is an interesting restriction such that the cooccurrence of *alle* and a definite article results in slight degradedness (51b):

- (49) a. all meine Freunde
 all my-INFL friends
 ‘all my friends’
 b. alle meine Freunde
 all-INFL my-INFL friends
 ‘all my friends’
- (50) a. all diese Leute
 all these-INFL people
 ‘all these people’
 b. alle diese Leute
 all-INFL these-INFL people
 ‘all these people’
- (51) a. all die Leute
 all the.NOM people
 ‘all the people’
 b. ? alle die Leute
 all-INFL the.NOM people
 ‘all the people’

Pafel (1994: 264-266) makes the proposal that uninflected *all* is adjoined to the determiner but that inflected *alle* takes a DP as a complement. Compare (52) to (53):



While this simple proposal covers a lot of ground, no mention is made of how to explain the degradedness of (51b).¹⁹

This contrast is found in other morphological cases as well, here illustrated with the dative:

- (54) a. mit all den Leuten
with all the.DAT people
'with all the people'
b. ? mit allen den Leuten
with all-INFL the.DAT people
'with all the people'

If the DP is replaced by a disyllabic pronoun, both examples are fine:

- (55) a. mit all denen
with all those-INFL
'with all those'
b. mit allen denen
with all-INFL those-INFL
'with all those'

The obvious difference between a possessive determiner or a demonstrative and a definite article is that the former two are disyllabic but the latter is monosyllabic. With this in mind, we can state as a first approximation that going from left to right, a disyllabic element cannot be followed by a monosyllabic one:

- (56) *Generalization #2: (preliminary version)*
If an element starts a disyllabic chain in the left periphery, the latter cannot be disrupted by a monosyllabic element.

Note that the generalization is silent about chains starting with a monosyllabic element "allowing" the (a)-examples above. Furthermore, unlike with abstract chains (section 2), here the trigger of the chain coincides with the head of the chain.

At first glance, one may think that German prefers trochaic feet, which yield a certain phonotactic rhythm in the pronunciation. This seems to be confirmed when three determiner elements are present (57a). However, we have already seen above that two monosyllabic elements can cooccur (*all die*). Furthermore, as pointed out to me by David Fertig (p.c.), the string in (51b) above becomes better with stress on *die* (57b); that is, when *die* functions as a demonstrative (also Pafel 1994: 238):

- (57) a. alle diese meine Freunde
all-INFL these-INFL my-INFL friends
'all these friends of mine'

¹⁹ This is not the place to critique this proposal. What is important for me here is that there is no explanation of the contrast in (51). Note also that it is sometimes claimed that uninflected *all* and inflected *alle* have different semantics (see Merchant 1996: 183 and Kobele & Zimmermann 2012: 249).

- b. alle DIE Leute
 all-INFL those.NOM people
 'all those people'

Note that while *die* is stressed now, it is still a monosyllabic element. Let us interpret multiple syllabicity and stress as related measures of heaviness. In other words, let us assume that multiple syllables in an element, on the one hand, and stress on an element, on the other, lead to heaviness of a word. This groups disyllabic and stressed monosyllabic words together in opposition to unstressed monosyllabic words.

Interestingly, if a preposed PP is added to cases like (51), both examples become worse:

- (58) a. (?) von Peter all die Autos
 of Peter all the.NOM cars
 'all the cars of Peter's'
 b. ?? von Peter alle die Autos
 of Peter all-INFL the.NOM cars
 'all the cars of Peter's'

Given that the PP involves more than two syllables, I restate disyllabic as multisyllabic. If this is on the right track, then we can reformulate the generalization above as follows:

(59) *Generalization #2: (final version)*

If an element starts a multisyllabic chain in the left periphery, the latter cannot be disrupted by a following lighter element.

Put differently, the relevant elements must be of the same weight or the relevant elements must increase in weight from left to right.

It is not clear what the explanation of this phenomenon is. Like the first type of chain, its direction is from left to right. Unlike the abstract chain, this type is about overt inflections on and stress of certain elements. This makes a selectional requirement as in the first chain implausible. At this point in the investigation, I can only speculate and suggest that equal or increasing weight of elements facilitates parsing (for some additional tentative remarks, see conclusion).

This generalization seems to carry over to another case. When a disyllabic demonstrative is followed by a lighter possessive determiner, the examples are slightly marked:

- (60) a. ? dieses mein großes Glück
 this-INFL my great-INFL happiness
 'this great happiness of mine'
 b. ? dieses mein Kleid
 this-INFL my dress
 'this dress of mine'

Interestingly, in the neuter nominative/accusative, the inflection on the demonstrative *dieses* is optional (61a). When the inflection is absent, the above examples sound a bit better:

- (61) a. dies(es) Kleid
 this-INFL dress
 ‘this dress’
 b. (?) dies mein großes Glück
 this my great-INFL happiness
 ‘this great happiness of mine’
 c. (?) dies mein Kleid
 this my dress
 ‘this dress of mine’

To the extent this is correct, this subtle difference between (60a-b) and (61b-c) is now expected.

3.2. Adjacency Requirement

There seems to be an additional requirement on the formation of this type of chain. Recall from the introduction that Bayer (2015) judges examples of type (62a) to be perfectly fine. As already pointed out in footnote 1, they are slightly marked for me. Interestingly, the possessor can also precede *alle* (62b):

- (62) a. ? alle Peter seine Bücher
 all-INFL Peter his-INFL books
 ‘all Peter’s book’s’
 b. (?) Peter alle seine Bücher
 Peter all-INFL his-INFL books
 ‘all Peter’s books’

While the judgements are very subtle, it seems that (62b) sounds a little better than (62a). When *alle* is replaced by uninflected *all*, the (a)-example gets worse:

- (63) a. ?? all Peter seine Bücher
 all-INFL Peter his-INFL books
 ‘all Peter’s books’
 b. (?) Peter all seine Bücher
 Peter all his-INFL books
 ‘all Peter’s books’

Something similar holds for preposed PPs with the qualification that *Peter* cannot precede the PP (as above, the addition of the proprial article *dem* does not improve the example; for Haider 1992: 315, examples like (64a) are fully ungrammatical):

- (64) a. ?? nach Hamburg Peter sein Zug
 to Hamburg Peter his train
 ‘Peter’s train to Hamburg’
 b. * Peter nach Hamburg sein Zug
 Peter to Hamburg his train

That there is no general reordering between *Peter* and the leftmost element is confirmed by examples involving *diese*:

- (65) a. ? diese Peter seine Bücher
 these-INFL Peter his-INFL books
 ‘these books of Peter’s’
 b. * Peter diese seine Bücher
 Peter these-INFL his-INFL books
 ‘these books of Peter’s’

Starting with the (a)-examples, we observe that if *Peter* intervenes between the trigger of the chain and the possessive determiner, the examples are marked. In fact, the examples are more marked if the trigger does not show any overt agreement (*alle*, *nach Hamburg*). As for the (b)-examples, if *Peter* can precede the trigger of the chain as in the cases of *alle* and *all*, the examples seem to improve. In other words, to the extent possible, there seems to be a preference to have the two determiner elements, *alle(e)* and the possessive determiner, adjacent.

Recall that preposed PPs are higher in the structure than *alle(e)* but that *diese* is below it:

- (66) a. (?) von Peter all die Bücher
 of Peter all the.NOM books
 ‘all the books of Peter’s’
 b. all diese Leute
 all these-INFL people
 ‘all these people’

I take this to mean that *Peter* in (64b) cannot move above the preposed PP for some independent reason. It is less clear though why *Peter* cannot move above *diese* in (65b). Specifically, with *diese* located below *alle(e)*, *Peter* should be able to move above *diese* just as it can with *alle(e)*. This, however, is not the case. It is not immediately clear how to make sense of this contrast involving *alle(e)* as in (62b) and (63b) vs. *diese* as in (65b).

Bošković (2004: 723) claims that certain light elements are invisible to the Verb-Second constraint in German; that is, his analysis proposes a “delayed,” PF account of Verb-Second. Let us assume then that cases involving *alle(e)* are special in that they also involve a “late” operation. Specifically, if (62b) and (63b) above have the same status, *alle* and *all* must be similar in some way. We have seen in section 2 that possessors of Possessor Doubling constructions are irrelevant for the establishment of an abstract agreement chain. Given this, it seems unlikely that an explanation for the slight grammaticality contrast can be found there. Rather, I tentatively suggest that this contrast is due to the formation of an overt agreement chain as discussed in this section. Let us assume that overt chains are best if they are not disrupted by a non-agreeing element, the possessor. In other words, if reordering is possible as in the cases of *alle* and *all*, then it can take place yielding an undisrupted overt agreement chain of two determiner elements.²⁰ That this is not possible with *diese* might suggest that this is a late, non-syntactic reordering. This seems to be confirmed by the observation in Cirillo (2016: 213) that *Peter* cannot move above *al* in Dutch (unlike German (63b)). I take this to mean that this late

²⁰ This leaves the degradedness involving a preposed PP in (64a) unaccounted for as there is only one determiner present.

reordering is a language-specific, non-syntactic operation.

4. Discussion

In this paper, I have discussed two types of chains, an abstract one and an overt one. Both chains involve elements in the DP-layer and above. Elements below these structural levels are part of these chains. As seen above, the presence of adjectives and numerals mitigate the degradedness if no element is in the DP-layer. However, these elements do not trigger the chains, nor do they seem to *actively* participate in those chains in any other way. As far as I know, there are no restrictions similar to those discussed above on numerals (67), adjectives (68), or just head nouns (69). They are all fine when occurring with or without a determiner:

- (67) a. die /diese /meine zehn Bücher
the.NOM/these-INFL/my-INFL ten books
'the/these/my ten books'
- b. Peters zehn Bücher
Peter's ten books
'Peter's ten books'
- c. zehn Bücher
ten books
'ten books'
- (68) a. die /diese /meine guten Bücher
the.NOM/these-INFL/my-INFL good-INFL.WK books
'the/these/my good books'
- b. Peters gute Bücher
Peter's good-INFL.ST books
'Peter's good books'
- c. gute Bücher
good-INFL.ST books
'good books'
- (69) a. die /diese /meine Bücher
the.NOM/these-INFL/my-INFL books
'the/these/my books'
- b. Peters Bücher
Peter's books
'Peter's ten books'
- c. Bücher
books
'books'

Note that the inflection on the adjective in (68) alternates between a weak ending in (68a) and a strong one in (68b-c). With both types of endings forming a syllable, this inflectional alternation

is independent of the two types of chains discussed above (for detailed discussion, see Roehrs 2015).

5. Conclusion

This paper has demonstrated that the empirical facts in the left part of the German noun phrase are very complex. Following Olsen (1989a) and Bayer (2015), I have interpreted these cases as agreement chains. They involve stronger contrasts for the abstract agreement chains (section 2) but more subtle differences for the overt chains (section 3). This seems to indicate that these are indeed two different phenomena that should not be collapsed into one. Furthermore, we have seen that both chains differ as regards the trigger of the chain. With abstract chains, the trigger does not coincide with the head of the chain; with overt chains, it does.

Despite these differences, there are also some similarities. Unlike concord, both chains are only built under certain conditions: the very presence of an element in the left periphery causes the abstract chain (due to concord) to exclude a (possessive) genitive feature; the presence of a disyllabic element in the left periphery activates the overt chain. Furthermore, both chains seem to work from left to right. This seems somewhat unusual for the abstract chains where in syntax, chains originate on the right, that is, lower in the structure. To account for this unexpected directionality, I proposed that a higher head (LP) selects a DP that cannot have a (possessive) genitive feature. Another commonality is that both chains manifest themselves in the left part of the nominal only. Empirically, one could state that the further away elements are from the head noun, the more restrictions seem to hold on them and their adjacent elements. One might suggest then that these chains, especially the second, are conditions to facilitate parsing; that is, they signal what belongs to the lower nominal.

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