On the Evaluation of Morphological Form of the German Universal Quantifier*

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Abstract

The primary aim of this paper is to propose a phrasal set-up of the quantificational domain in the nominal hierarchy of projections that accounts for the differing linearizational and inflectional properties of strong and weak quantifiers in German in the sense of Milsark (1974, 1977). I argue that the German bare vs. inflected universal quantifier dichotomy constitutes a solid basis for the proposal of two diverging quantifier phrases (QP). Additionally, evidence is put forth for the existence of two discrete possessive heads (Poss⁰). The main difference between these two instances will be found in their value of grammatical definiteness due to their varying positions. With these axioms combined, we arrive at a symmetrical bisection of [±definite] QP and PossP encircling the nominal core categories D and N, respectively. I also make use of this phrasal configuration to develop an algorithm for the evaluation of morphological form on strong quantifiers, which is arguably also applicable in further instances of morphological evaluation, namely the division of strong/weak adjective inflection in exceptional case-marking configurations. In addition, the analysis proposed thereby allows pinning down the locus of application of said algorithm at an early stage in the phonological component: the subcomponent Morphology (Chomsky 1995).

1. Introduction

The purpose of this paper is the establishment of a connection between linearizational and inflectional divergences of strong and weak quantifiers (henceforth Q_s vs. Q_w) in the sense of Milsark (1974, 1977) and their respective external merging-sites in the minimalist framework (Chomsky 1993 et seq.). I argue on the basis of German quantified determiner phrases (DPs) that the connection itself can be identified as the value of grammatical definiteness of said elements, which constitutes the origin for the development of a symmetrical phrasal set-up of the quantificational domain in the nominal hierarchy of projections. However,

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I start out in a different domain, namely the strong/weak adjective inflection in German, and try to deduce a unified analysis in what follows.

2. Preliminary Observation: German Adjective Inflection and Definiteness

It is well-known that adjectives in German display different inflectional patterns depending on the status of definiteness of the DP they are part of. Consider (1), in which the nominal complex is headed by the definite masculine determiner *der* and the indefinite D *ein*.

- $\begin{array}{ccc} \text{1)} & \text{a)} & \text{der grüne Baum} \\ & \text{the}_{[\text{+def}]} \text{ green}_{[\text{weak}]} \text{ tree} \end{array}$
 - b) ein grüner Baum $a_{[-def]}$ green $_{[strong]}$ tree

With the adjective not being dominated by any overt D-element, strong inflection is obligatory. Weak inflection, however, is not only triggered by the definite determiner but also by demonstratives, possessive pronouns (at least with plural head nouns; cf. fn. 1) as well as inflected strong quantifiers like *all-e* ('all').

Additionally, Fanselow (2013) observes that in complex, exceptionally case-marked (ECM) noun phrases, only the highest adjective bears strong inflection in German. The relation, however, has to be re-evaluated when a subpart of the DP (say, A-N) is fronted, stranding the previously highest A in base position. In these cases, both adjectives carry strong inflection.²

iv. Ich habe viel(*-es) estnisches.

¹ In order to exemplify the effects of the universal quantifier, I make use of plural head nouns in what follows.

² A similar contrast can be observed with weak quantifier inflection (the mass head noun below is necessary to combine the quantifier, which takes plural nouns, with an element bearing neuter nominal inflection; cf. Fanselow 2013:14):

i. Ich habe viel(*-es) Geld.I have much(*-infl) money

ii. Ich habe viel(-es). / [Geld]_i habe ich viel(-es) t_i. I have much(-infl) / Money have I much(-infl)

iii. Ich habe viel(*-es) estnisches Geld. I have much(*-infl) Estonian money

- 3) a) Rotem polnischen Wein vertrauen wir nicht. (= Fanselow 5.) red.sg.dat.strong Polish.sg.dat.weak wine trust we not *We do not trust red Polish wine.*
 - b) Polnischem Wein vertrauen wir nur rotem.
 Polish.dat.sg.strong wine trust we only red.dat.sg.strong
 We only trust red Polish wine.

Based on this contrast, Fanselow (2013:20) argues that "morphological shape must be determined after movement," if, as I will do with Fanselow, discontinuous DPs are understood as originating from one discrete projection. I will come back to this in section 4.

3. A Phrasal Set-Up for the Quantificational Domain in *Recursive Quantification*³

Ordering the categories introduced in section 2 concerning their unmarked linear order allows for two interesting observations on quantification and definiteness in German: First, strong and weak quantifiers (exemplified here with *all*- and *viel*- ('many'), respectively) differ in their default (i.e., non-partitive) position with respect to D/Dem and the possessive pronoun (Poss_{PRO}), with Q_S preceding these elements and Q_w following them:

4) all(-e) {die, diese, meine} vielen N all(-infl) {the, these, my} many N

Second, the elements classified as [+definite] above, by means of them triggering strong inflection on adjectives, cluster together preceding all elements that do not affect weak adjective inflection, such as weak quantifiers, numerals and adjectives themselves.⁴

I have much(*-infl) Estonian

Semantic parallels between adjectives and Q_W can be drawn in Milsark's (1974, 1977) own typology of universals vs. cardinality words. Therein, universals are understood as necessarily related to cardinality, whereas this is not the case for cardinals, as, arguably, also for attributively used adjectives. If this analogy holds, the data above might be understood as a syntactic reflex in languages which make use of strong vs. weak adjective inflection.

- 3 The term was coined by Jackendoff (1968), who to my knowledge was first to discuss the phenomenon of multiply quantified noun phrases in an accessible publication.
- 4 I leave out lexical possessives for the moment, which do not trigger strong inflection, either; cf. section 4 below.

5)
$$Q_S > D/Dem > Poss_{PRO} > Q_W/Num > Adj > N$$

In what follows, I assume this ordering to reflect the phrasal set-up of the quantificational domain in the nominal hierarchy of projections. ^{5,6} The proposal of two quantificational heads is reminiscent of Zamparelli's (1995) division of strong vs. predicative determiner phrases (SDP vs. PDP). Yet, in his system, the definite demonstrative and the determiner standardly constitute instances of the former. This departure from Zamparelli is a critical feature in the analysis, elaborated below.

While as of yet being a mere working hypothesis, I hope to demonstrate below that it also constitutes a promising starting point for the investigation of quantified structures in German.

4. Quantifier Inflection in the Definiteness Domain

Merchant (1996), building on Sportiche (1988) and Shlonsky (1991, on Hebrew; see also Giusti 1991 for a parallel analysis based on Italian data), describes the Q_S *all*- in German as optionally inflected for case with the quantifier in its basegenerated (i.e., *External Merge*, EM) position heading DP, irrespective of the selecting verb's case frame. In contrast, when the DP is moved out of the c-command domain of the quantifier, overt inflection turns obligatory:

6) a) Gestern haben all(e) diese Studenten protestiert. (= Merchant 4.a) yesterday have all(-infl) these students protested *All these students protested yesterday*.

I nevertheless adopt this string as a preliminary argument to assume a discrete possessive head and that the mutual exclusiveness of the D/Det and the pronoun might be attributed to unrelated factors. Below I elaborate on the plausibility of Poss_{PRO}P in more complex structures, namely the possessor doubling construction (cf. e.g., Corver 1990) and on the basis of symmetry in the nominal hierarchy of projections.

6 The proposed hierarchy (as well as its empirical motivation) can be understood as an instance of the combination of the QP- and AP-hypothesis in Cardinaletti & Giusti's (2006) terms.

⁵ The claim of Poss_{PRO} as a discrete head needs further justification. The co-occurrence of D and Poss_{PRO}, however, is not uncommon across languages (as, for example, in Paduan, Old Spanish and Italian, see e.g., Cardinaletti 1998 and references therein). Giorgi & Longobardi (1991) therefore divide languages w.r.t. their possessive pronouns behaving like determiners or adjectival elements. The only co-occurrence of the pronoun with D/Dem in German is found in a quasi-lexicalized emphatic construction:

i. diese meine Bäume these my trees

b) Diese Studenten haben gestern alle protestiert. (= Merchant 5.a) these students all-infl

Merchant (pace Shlonsky) takes quantifier inflection to be a precondition for rather than a reflex of movement of the coordinated DP. In his analysis, the overt realization of the inflection signals the presence of an inflectional agreement feature F, which has to be checked in a spec-head configuration not later than at LF (thereby accounting for its optionality in EM-configurations).

We can, however, find configurations in the German QP that challenge Merchant's analysis, since the relation between stranding contexts and obligatory inflectional realization is not exclusive. Consider (7) below, in which the overt realization of the inflection on Q_S is obligatory:

Here, all elements classified as [-definite] above can only be conjoined with Q_S if the quantifier bears inflection. Observe that the presence of only one of the elements classified as [+definite] above renders inflection on Q_S optional again:

With this observation in mind, let us reconsider the stranded quantifier configurations. I will assume with Merchant that a discontinuous DP at Spell-Out originates from a discrete nominal hierarchy of projections via movement (parallel to Fanselow's approach to stranded adjectives, sketched in section 2).

It turns out that these structures are also non-uniform with respect to inflectional realization on the quantifier. Consider (9), in which the head noun *Medaillen* ('medals') of the strong quantified DP has raised to a sentence initial projection to receive strong contrastive focus.

Pokale habe ich wenige, [aber Medaillen_i habe ich all(-e) diese t_i gewonnen].

cups have I few [but medals_i have I all(-infl) these t_i won]

I have won a few cups but all these medals.

The optional realization of inflection on Q_S seems to be dependent on the adjacency of the quantifier to an element classified as [+definite] above. Keeping this in mind, let us again turn to the hierarchy of projections proposed at the end of the last section.

Here, these elements were grouped together with the universal quantifier constituting the highest head. If quantifier stranding is understood as movement out of the complement of Q_S^0 , the obligatory realization of quantifier inflection readily falls into place with inflection on adjectives (given that we argue with Fanselow (2013) that morphological effects are determined after movement).

- 10) a) All(-e) die Bäume habe ich gefällt. all(-infl) the trees have I chopped
 - b) [Die Bäume]_i habe ich all*(-e) <die Bäume>_i gefällt. [the trees]_i have I all*(-infl) <the trees>_i chopped
 - c) All*(-e) grünen Bäume habe ich gefällt. all*(-infl) green_[weak] trees have I chopped
 - d) [Grüne Bäume]_i habe ich all*(-e) <grüne Bäume>_i gefällt. [green_[strong] trees]_i have I all*(-infl) <green trees>_i chopped

If the same evaluative mechanisms underlie these effects, it is possible to modify the proposal of Fanselow (2013) by locating its application at PF, since it applies to linearizations rather than hierarchies. But this is only half of the story. Upon closer examination, adjacency cannot be the trigger for quantifier inflection, nor for the strong/weak adjective distinction. Evidence comes from structures involving a lexical possessive (Poss_{LEX}), omitted in the proposed hierarchy above. I will take on the guiding idea from section 3 and assume the most deeply embedded surface position of a phrase to be its EM-site. In the case of Poss_{LEX}, this position is right adjacent to the head noun – the complement of N⁰ in structural terms.⁷ Observe that by implementing this proposal into the hierarchy (5) we arrive at a twofold symmetry in the nominal hierarchy of projections, with [+definite] quantifier and possessive enclosing the definite core category D, and [-definite] Q and lexical Poss encircling N:

$$[Q_S > D > Poss_{PRO}]_{+def} > [Q_W > N]_{-def} > Poss_{LEX}$$

Henceforth, I will refer to the higher part as the *Definiteness Domain* (DDef) of N. Taking (11) as a vantage point, I propose that prenominal lexical possessives have moved to the specifier of Poss_{PRO}P. Evidence in this regard comes from the linearization of *possessor doubling constructions* (PDC) in colloquial German (cf. Corver 1990 for a parallel analysis applying at the DP-level).

12) alle (? diese) Martin seine grünen Bäume

⁷ Longobardi (1994: fn. 25) speculates on a similar structure underlying prenominal genitives. Since I am proposing a more articulated phrasal set-up, however, the terminal positions of movement differ.

all-infl (? these) Martin_[dat] his green_[weak] trees all Martin`s green trees

The presence of the emphatic demonstrative in (12) pinpoints the position of the D/Dem-head in the line of projections (cf. fn. 5). The movement of the lexical possessive might be motivated by partial φ -valuation. Ignoring case licensing differences here, I assume that the same movement takes place with prenominal lexical possessives when no pronoun is overtly realized.

Martins grüne Bäume
Martin_[gen] green_[strong] trees

Martin`s green trees

Observe that the adjective in (13) displays strong inflection. Given the criteria for definiteness from section 2, the lexical possessive would have to be categorized as grammatically [-definite]. But the datum in (14) suggests that this conclusion is premature:

des Clans grüne Flaggen
[the clan]_[gen] green_[strong] flags

the clan's green flags

This lexical possessive is certainly grammatically definite; still, we observe strong inflection on the adjective.⁸ Let us next turn to a more complex paradigm:

- 15) a) all*(-e) grünen N all*(-infl) green_[weak] N
 - b) seine grünen N his green_[weak] N
 - c) Martins grüne N Martin $_{[gen]}$ green $_{[strong]}$ N
 - d) all(-e) seine grünen N all(-infl) his green_[weak] N
 - e) all*(-e) Martins grünen N all*(-infl) Martin_[gen] green_[weak] N
 - f) all(-e) Martin seine grünen_[weak] N all(-infl) Martin_[dat] his green_[weak] N^9

⁸ See Roehrs (2005:137 f.) and references therein on how prenominal lexical possessives may alter the definiteness of NP for further computation (in existential contexts). Given the observation in (14), we can conclude that the inner value of DP is left untouched.

⁹ Variable grammatical judgments concerning strong/weak adjective inflection with prenominal possessives in (15)e) and f) might be related to the interpretation of partitive vs. abso-

The argument here is twofold in that it concerns quantifier and adjective inflection alike. Observe, first, that (15)a) - c) reiterates the environments for testing definiteness introduced above, with the now established classifications. (15)d) mirrors (4) in that the coordination of the pronoun and the quantifier renders inflection on the latter optional. (15)e) illustrates the first unexpected property, as adjacency of the lexical possessive to the adjective does not trigger strong inflection when Q_s dominates the configuration. Nevertheless, adjacency of the possessive to the quantifier seems to render inflection obligatory given its assumed status as [-definite]. In contrast to (15)e), (15)f) provides evidence that obligatory inflection on the quantifier is not dependent on the adjacency of Q_S to Poss_{LEX}, but rather on the absence of the possessive pronoun in prenominal lexical possessive configurations. Concerning inflection on the quantifier and adjective, then, (15)e) and f) parallel a) and d), respectively. This is to say that the lexical possessive does not intervene in the relations/dependencies responsible for overt realization of inflection: they hold as if Poss_{LEX} (independent of its inherent status of definiteness) was not present. In the analysis advocated here, 'not present' would translate into head status in (5)/(11): Poss_{LEX}P is not part of the main line of projections and thus has no effect on the phenomena under consideration. The analogy deduced from (11) above, i.e., that [\pm definite] elements encircle D and N respectively, can therefore be modified: it gains complete symmetry ([± definite] QP and PossP) w.r.t. the external status in the line of projections of the head noun.

5. The Locus of Application of Inflectional Evaluation

As we have seen, distribution of quantifier inflection is dependent on the overt realization of X^0 elements in DDef in the projection line of the head noun. However, we already know from the stranding contexts discussed in section 4 above, as well as from Fanselow's findings, that the evaluation of these relations cannot have taken place at the stage of EM of said heads but must be at least as late as after movement. In the equal treatment of adjective and quantifier inflection (at least concerning the underlying mechanisms of evaluation) we are able to pin down the timing of application further: recall that we related the inflectional properties of Q_S to a feature, rather than to a certain head/category, present or absent in the head of the complement (and the head of the complement's complement, i.e., the Definiteness Domain's two discrete phrases D and Poss_{PRO}).

lute sets, i.e., the adjective is interpreted either in the hierarchy of projections of the head noun or the possessive noun phrase (with its morphological form evaluated in terms of the local mechanisms elaborated on here).

Employing the *copy theory of movement* (Chomsky 1993), I propose that evaluation of morphological form (qua quantifier and adjective inflection) has to take place early in the phonological component, namely in the morphological subcomponent *Morphology* (Chomsky 1995:229), which is taken to be still hierarchically ordered (i.e., before *Linearize* (Nunes 2004:24) applies).

The argument goes as follows: the morphological reflex is visible on the surface (contra LF), yet, as argued above, hierarchical relations are at play in the mechanisms underlying the evaluation (contra post-*Morphology* PF, i.e., after *Linearize* has applied). Furthermore, the copies of moved elements must have already been deleted by *Chain Reduction* in the sense of Nunes (1995, 2004) (contra *narrow syntax*), since they bear the same value of definiteness as the head of the chain. ^{10,11,12}

Having pinned down the timing of evaluation, I derive the form of the algorithm in what follows. Recall that the Q_S bears an intrinsic formal feature [+definite]: every DP headed by the quantifier displays grammatical definiteness; the question is rather where it is coded morpho-syntactically. Turning to the proposed phrasal make-up of DDef in (11), we find two other heads (D and $Poss_{PRO}$) capable of coding grammatical definiteness. This excludes the simplest notion 'head of the complement', if we assume for the sake of uniformity that phonologically empty heads may still be present in the hierarchy of projections. Yet, since we located application of evaluation at PF, sets of phonological features P (Nunes 2004) are now accessible to the computational system. Therefore, it is no theory-internal contradiction to tie these features to formal ones in a phrase-structural definition like (16):

¹⁰ I thank Werner Frey (p.c.) for pointing out the theory-internal impact of the copy theory of movement to me in this context.

¹¹ It is not possible to employ the notion of FF-Elimination (Nunes 1995) of [+definiteness] to derive the relations of heads under consideration, since the deletion of Formal Features applies to the output of Linearize, which is phonetically realized thereafter (cf. Chomsky 1995:230 f.).

¹² The analysis proposed here may arguably serve as an indication as to how fundamental operations are ordered in the early stages of the phonological component, mapping $\Sigma \to \pi$, with Chain Reduction preceding Linearize (as well as Morphology), in accordance with (and elaborating on) Nunes (2004:25).

¹³ This view gains further backup in a unified analysis of quantifier and adjective inflection. As observed e.g. by Cinque (2010), phonologically empty adjective-heads in the nominal domain may still project.

Realize [+def] on Q_S if the first head of its complement which bears P does not bear [+def]¹⁴

This formulation captures the relation of Q_S to intrinsic [-def] elements as well as presumably unvalued ones like adjectives. Inflection on Q_S might, then, be understood as a *Last Resort* strategy to code intrinsic definiteness of universally quantified DPs on the surface.

6. Speculations on the Purpose of Overt Coding of Definiteness

Up until now, nothing has been said as to why overt definiteness is obligatory with German strong quantified DPs. I propose with Giannakidou (2004:10), building on Westerståhl (1985), that the familiarity property of the definite D constitutes a *contextual domain restricting* function by introducing a context set. If, then, *contextual domain restriction* in German happens (i) overtly and (ii) at the D-level (see Martí 2003, 2009; DDef in the system elaborated here) – employing Giannakidou`s typology – (16) applies according to the *explicit strategy of domain restriction* (cf. Neale 1990, Fintel 1998). Therein, a unified explanation might be found as to why quantifier classes differ in their position with respect to D across languages as well as in their interpretation of presupposionality (with Q_S-DPs necessarily referring to non-empty sets – *veridicality* in Giannakidou`s 1998 terms – while Q_w-DPs do not carry such a restriction on interpretation; cf. Etxeberria 2009:85-89, 2012: ch. 2.3 on Basque). Q_Ss hence restrict the range of the nominal in their complement, while Q_ws cannot do so: strong quantifiers carry intrinsic definiteness due to their EM-site in DDef.

7. Conclusion

Strong and weak quantifiers differ with respect to their EM-site in the nominal hierarchy of projections. While weak quantifiers are merged below the definite

i. Realize [strong]/[+def] on A iff the first head dominating A which bears P does not bear [+def]

Two comments are in order here: Observe that the formulation of (i) is in line with the – so far covert – assumption that [weak]/[-def] constitutes the default case. Furthermore, applying the concept of dominance does not contradict the derivational character of the system, since it is a rule of evaluation applying after movement at PF. Moreover, the application of (i) must proceed downwards, beginning with the highest A, to derive the correct inflectional pattern. (i) can only constitute a first departure to a full analysis of adjective inflection.

^{14 (16)} can be modified to account for strong/weak adjective inflection in ECM-contexts:

head D (and Poss) and therefore do not alter the definiteness value of the DP, the strong Q *all*- is situated above these elements, likewise carrying [+def]. German poses a special case in that the strong universal quantifier obligatorily displays this intrinsic feature/value on the surface by means of inflection if none of said elements, standardly employed to do so, is phonetically realized. The purpose of this *Last Resort* strategy seems to be rooted in the *explicit strategy of domain restriction* qua definiteness. In addition, I propose the existence of two discrete possessive heads, which also differ in their value of grammatical definiteness w.r.t. the external status in the line of projections of the head noun. Bringing all these findings together, we arrive at a symmetrical build-up of the quantificational domain:

17)
$$[_{QsP} Q_S^{\ 0}[_{DP} D^0/Dem^0[_{PossPROP} Poss_{PRO}^{\ 0}[_{QwP} Q_W^{\ 0}[_{NP} N^0[_{PossLEXP} Pos_{LEX}^{\ 0}]]]]]]$$

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