Jordan Chark (ZAS)

Main claims In this paper, I provide further evidence for a unified view of homogeneity and non-maximality, assigning them the same source in supervaluationist reasoning about pluralities in different domains (Križ and Spector 2021). I discuss novel data from the empirical domain of embedded interrogatives, which are known to exhibit homogeneity effects, in their interaction with *homogeneity removers* in the form of question-internal quantifiers like German *wer alles* and English *who all* (present in a number of varieties, ranging from Northern Ireland to the US) (Križ 2015; Blok and Chark 2021). The relevant intuition regarding (1) is that a mention-all reading is enforced.

(1)   A: I know who all was at the party. $\rightarrow$ A can list off the guests.

Background While the precise treatment of these quantifiers has been debated (Beck and Rullmann 1999; Zimmermann 2007), one important generalisation that has emerged is that these items are *homogeneity removers*, illustrated in (2) (Blok and Chark 2021). Due to homogeneity, there is a truth-value gap in embedded interrogatives: *Lea doesn't know who baked bread* is true iff for no x, s.t x baked bread, Lea knows x baked bread, false iff this holds for *all* x, and undefined otherwise. What *all* does is collapse this gap. In other words, it enforces maximal construals for the argument with which it is indexed (Križ and Spector 2021). Moreover, question-internal *alles* is not the only quantifier known to remove homogeneity; this property is shared by inflected *alle*, which despite similar appearances patterns differently (Reis 1992). The main contribution of this paper is thus to articulate how different types of non-maximality interact with quantifiers in different scopal configurations, while simultaneously arguing for homogeneity and non-maximality being two sides of the same coin.

(2)   Lea does not know who **all** baked bread, but she does know that Sebastian baked bread.

Vague and non-vague non-maximality In recent work, Haslinger (2022) distinguishes between two types of non-maximality: *vague* and *non-vague*. The former exhibit the Sorites paradox, a prototypical diagnostic for vagueness. The latter exhibit non-maximal construals arising due to context-dependence with regard to a potentially non-universal QUD (corresponding to a mention-all/mention-some distinction). Interestingly, while question-internal *alles* can be characterized as ruling out *non-vague non-maximality*, it displays Sorites effects in *vaguely non-maximal* contexts, shown in (3) (data in 3-5 due to Nina Haslinger, p.c.).

(3)   **Context:** A and B were at a party. There were 10 of their friends there. B was completely wasted and is worried he might have done something embarrassing he doesn't remember. A wants to see how reliable B's memories of the party are. B remembers that in total there were 10 of his friends at the party.

a.   B is able to name one of the 10 friends. B: #Ich weiß noch, wer von unseren Freunden (alles) auf der Party war. Gloss: *'I remember, who of our friends (alles) at the party were'*

b.   B is able to name five of the 10 friends. B: Ich weiß noch, wer von unseren Freunden (#alles) auf der Party war.

c.   B is able to name nine of the 10 friends. B: Ich weiß noch, wer von unseren Freunden (alles) auf der Party war.

d.   B is able to name all 10 of the friends. B: Ich weiß noch, wer von unseren Freunden (alles) auf der Party war.

In the above, there is no clear cut-off point for the truth or falsity of the sentence. In the below, (4), a context where a universal, non-vague QUD is the sole plausible one, the effect of *alles* is to enforce mention-all. Interestingly, in these contexts the mention-all interpretation is the only one available, with or without the presence of *alles*.

(4)   **Context:** A and B were at a party. There were 10 other people there. A just received an anonymous warning that there was at least one person infected with Covid at the party. They want to notify all the others. A asks B if he remembers who exactly was there.
         a.   B is able to name nine of the 10 people. B: #Ich weiß noch, wer (alles) auf der Party war.
         b.   B is is able to name all 10 people. B: Ich weiß noch, wer (alles) auf der Party war.

Finally, there is a related observation that forms the basis for my approach: inflected *alle* behaves differently from non-inflected, question-internal *alles*. Namely, the former rules out imprecise QUDs, in addition to enforcing mention-all readings. This is illustrated below in (5):

(5)   **Context (3c) 9/10**: #Ich weiß noch, wer von unseren Freunden **alle** auf der Party waren.

Homogeneity (removal) is local I take the contrast in the availability of an imprecise QUD under particle *alles* and inflected *alle* shown above in (3) and (5) as a starting point for probing the mechanism of homogeneity removal. I argue that the relevant contrast falls out as a consequence of diverging scopal construals: particle *alles* is strictly local, enforcing maximality at the level of its associated argument *only* (Reis 1992; Zimmermann 2007; Chark 2021). Inflected *alle*, on the other hand, is a VP-level modifier, which results both in enforcing mention-all readings and in ruling out vague QUDs altogether. The relevant data-point shown in (6) is adapted from Reis (1992):

(6)   Gloss: The editor knows, whose books *alle/alles* by R-R poorly reviewed were

a.   Der Redakteur weiß, wessen Bücher **alle** von Reich-Ranicki schlecht rezensiert wurden.
b.   Der Redakteur weiß, wessen Bücher **alles** von Reich-Ranicki schlecht rezensiert wurden.

The above contrast two construals: (6a) can only be understood as referring to the editor's knowledge regarding the authors whose entire works have been badly reviewed by R-R; this can be true in a case where there is only one such author in the relevant domain. (6b), on the other hand, refers to the editor's knowledge regarding all authors of books that have received a bad review, not taking into account whether this constitutes any individual author's entire set of works. The relevant presuppositions also diverge: (6a) presupposes that for each author, there is a plurality of books, whereas (6b) presupposes multiple authors, who may each only have composed a single book (ibid: 473). While both examples exhibit homogeneity removal (though with different scopal construals), only (6a) entirely rules out non-vague QUDs: it cannot be the case for any of the relevant authors in the answer set that only a subset of their books received a bad review. (6b) can be true under a vague QUD, as shown in (7).

(7)   **Context:** The editor of a publishing house has four authors as clients: Ada, Bee and Mark, who always get bad reviews from R-R, and Jess, who has received mixed, but primarily positive reviews. The editor only remembers that A, B, and M had been badly

reviewed.

Analysis: Embedded int. I take it that the data in the previous section support a view whereby the alternatives associated with the computation of homogeneity may be projected *at different levels*. I propose that the question denotation in embedded contexts is **semantically plural** (cf. Cremers 2016; Schmitt 2019). Following Schmitt (2019), I assume all domains have plural counterparts, including individuals as well as propositions. The relevant question denotation (before further embedding) consists of a *set of plural propositions*. This is a set consisting of *atomic* propositions and their possible sums—atomic propositions can be defined in relation to a Hamblin set. I assume Schmitt's (2019) rule of plural composition defined in (8a) (reproduced from Haslinger 2021: 296). Under the framework elaborated on in Haslinger (2021), non-maximal readings are derived from *tolerant* as opposed to *strict* denotations, the former only requiring that some part of a plurality of propositions is true in a world *w*.

(8)   For any type *a*, there is a set $\underline{\mathrm{D}}_a = \mathscr{P}(\mathrm{D}_a)$ (Schmitt 2019)

    a.   For a predicate F of type $\langle\langle a,b\rangle,t\rangle$ and a predicate A of type $\langle a,t\rangle$: PL(F,A) = $\{\oplus\{g(b) \mid \langle g,b \in C\rangle \mid \exists f \in F, a \in A.\ C$ is a paired cover of f and $a\}$

Question-internal *alles* is subject to an LF sisterhood condition with the wh-item located in the question nucleus (Zimmermann 2007; Blok and Chark 2021), where it reconstructs and is bound by a higher covert wh-element as argued for in Schwarz, Hirsch and Socolof (2020). The meaning contribution of question-internal *alles* is two-fold: it comes with a plurality presupposition regarding its associate and universally quantifies over covers of this plurality. More precisely, *alles* ensures that **the mapping between atoms of the function plurality and the argument plurality is restricted to maximal construals** (cf. Brisson 2003, Blok and Chark 2021). It is in this way that the alternative set can *be collapsed*, leading to homogeneity removal.

Question-internal *alles* vs. inflected *alle* Now we are in a position to appreciate how the diverging readings of question-internal *alles* and inflected *alle* come about. I take it that the inflected *alle* as shown in (5) and (6b) is a universal quantifier adjoined at VP-level (9a) (Dowty and Brodie 1984; Zimmermann 2009). The singleton output of ANS applied in (9), using a toy world of three individuals, is shown below in (9b); I further assume that *know* takes a proposition *p* and an individual *x*, returning truth iff *p* holds in x's doxastically available worlds. Here it is asserted that all mereological subparts of the plural individual *our friends* came to the party in these worlds, **thereby ruling out** any potential *tolerant* truth conditions which may prune one individual alternative that did indeed come to the party in *w*. The reason why this vague reading is at all available under question-internal *alles* is that the assignment of paired covers **occurs at an earlier stage of the derivation**: maximal pair construals are enforced as the wh-item combines with the VP. However, the set of plural individuals that composes with VP is not immune to a vague construal, despite the general contribution of question-internal *alles* being to remove non-maximality.

Conclusion: The grammar of German allows us to disambiguate between homogeneity removal at different stages in the derivation, shedding light on the importance of **locality** for the computation of alternatives that are relevant for homogeneity/non-maximality. Moreover, the account in this paper supports a **unified view** of these two phenomena. Embedded interrogatives are useful environments to disambiguate between different lines of analysis—in addition to the data discussed above, this account predicts that both question-internal and inflected *alles* ought to remove other properties associated with plurals, like cumulativity (Schmitt 2019). This prediction appears to be borne out in experimental work (Chark 2022).

(9) I_1 know ANS $[\lambda p \, [wh\exists \, \lambda x \, [\, ? \, p \,] \, [\, [which \, x] \, friends] \, [alle \, [came]]]]$

    a. $[[alle]] = \lambda P.\lambda x.\forall z[\, z \leq x : [P_w(z)]]$

    b. $\{\lambda w'.came_{w'} \, (a \oplus b \oplus c)\}$

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