On semantics of the German *wh*-modifying particle *alles*

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1. Introduction

In this paper, we deal with the German particle *alles* in questions and exclamatives. As observed by Reis (1992), Beck (1996), and Zimmermann (2007), this particle can modify a *wh*-phrase in questions.

(1) Wer ist alles gegangen?
who.nom is all gone
'Who all left?'

(Zimmermann 2007:634)

In (1) the addressee is required to give an exhaustive answer: the answer to must identify all the people who left. In addition, *wh-alles* shows a plurality effect as shown in (2): an answer that mentions only one individual is infelicitous, unless it is marked by *nur* 'only' or *als einzige* 'alone', as noted by Zimmermann (2007).

(2)

a. Q: Wer ist alles gegangen?
'Who all left?'

b. A1: Jenny und Sarah sind gegangen.
'Jenny and Sarah left.'

c. #A2: Jenny ist gegangen.
'Jenny left.'

d. A3: Nur Jenny/Sarah ist als einzige gegangen.
'Only Jenny/Sarah alone left.'

(Zimmermann 2007:634

Roguska (2007) and d'Avis (2013) point out that *alles* can be used also in exclamative clauses as in (3).

(3) Wen du alles eingeladen hast!
who.acc you all invited have
'The people who you invited!/You invited everyone!'

At first sight, the same plurality effect seems to be observed in exclamative clauses with *alles*. (4a) and (4b) indicate that an exclamative clause with *alles* is infelicitous if it expresses surprise at meeting one unexpected person.

(4)

a. Context 1: Peter went to a doctor. Surprisingly, the doctor was Georg, who was an acquaintance of Peter. Peter reports:
Wen ich (#alles) getroffen habe!
who.ACC I all met have
'The people I met!/I met everyone!'

b. Context 2: Peter went to a doctor. Surprisingly, the doctor was Georg, who was an acquaintance of Peter. Additionally, the receptionist was Maria, who was also an acquaintance of Peter. Peter reports:
Wen ich alles getroffen habe!
who. ACC I all met have
'The people I met!/I met everyone!'

However, the plurality effect does not always hold in exclamative clauses. In (5), speaker B seems to be surprised at the fact that A is reading one very difficult book, but *alles* is felicitous.

(5)

a. A: Ich lese die „Kritik der reinen Vernunft".
I read the Critique of Pure Reason
'I'm reading the "Critique of Pure Reason".'

b. B: Was du alles liest!
what you all read

‘The thing you read!/You read everything!’

(Roguska 2007:163)

Intuitively, speaker B in (5) infers that A must read other books when A reads such a difficult book, and the plurality requirement is fulfilled by this inference, but it is unclear why such an inference is impossible in the doctor’s example (4a). The aim of this paper is to propose a unified semantics of *alles* that captures these variable plurality effects in questions and exclamatives.

2 Proposal

First, we assume that *wh*-phrases have a quantifier type and the scope of these phrases are lifted to a set of propositions (cf. Karttunen (1977)), and that the resulting *wh*-clauses denote a set of possible answers:

(6)

a. [$_{CP}$ wen$_i$ [$_A$ λx_i lift ich t_i getroffen habe]]
b. [[wen]] $^{w, c}$ = λ*P*<*e, <st, t*>> . λ*p*. ∃*x* [person(*x*) & *P*(*x*)(*p*)]
c. [[A]] ^{w,c} = λ*x*.λ*p*.*p* = met(*x*)(I)
d. [[CP]] ^{w,c} = λp.p = ∃x[person(x) & met(x)(I)]

In addition, following d’Avis (2001), Zanuttini and Portner (2003), Castroviejo Miró (2010), and Balusu (2019), we assume that an exclamative clause denotes a set of propositions. We further assume that *alles* is a modifier of a *wh*-phrase and that *wh*-clauses (= CP in (7)) are combined with one of the force operators (ANS for questions and EXCL for exclamatives):

(7) [ANS/EXCL [$_{CP}$ wh alles$_i$ […t_i …]]

The evidence supporting the view that *alles* is a *wh*-modifying operator is the data in (8): *alles* can be adjacent to a *wh*-phrase.

(8) Wen alles hat er gestern besucht?
who.ACC all has he yesterday visited
'Who all did he visit yesterday?'

(Reis 1992:634)

Based on these assumptions, we define *alles* as in (9a), where *R(P)* is equivalent to a set of possible answers (= [[CP]]^{w,c} in (6d)) and henceforth abbreviated as *S*:

(9) [$_{CP}$ wen alles$_i$ [$_A$ λx_i lift ich t_i getroffen habe]]

a. [[alles]]^{w,c}
= λ$R_{<e,\ <st,\ t>,\ <st,\ t>>}$.λ$P_{<e,\ <st,\ t>>}$.λ$p_{<s,\ t>}$: ∃q ∈ R(P)[p ≥ $_S$ q & p ≠ q]. p ∈ R(P) & ∀p' ∈ R(P) [p ≥$_S$ p'].

b. [[CP]]^{w,c} = λp:∃q∈ S [p ≥$_S$ p & p ≠ q]. p ∈ S & ∀ p' ∈ S [p ≥$_S$ p'],
where S = { p : p = ∃x[person(x) & met(x)(I) }

According to (9a) and (9b), *alles* imposes a restriction on a set of possible answers *S* through a strength ranking ≥$_S$, which is based on either entailment or non-entailment scales: it introduces the presupposition that there should be a proposition *q* in *S* that is not as strong as *p*. In addition, *wh-alles* returns another set of propositions, each member of which is a possible answer (i.e. p ∈ S) and the strongest among the members of *S*. In what follows, we demonstrate that the variable plurality effects in questions and exclamatives can be derived from the strength ranking ≥$_S$ introduced by *alles*.

2.1. Analysis for *alles* in questions

We first see how our proposal works in questions. Following Dayal (1996), we assume that the ANS operator in (10) takes a set of propositions *Q*, which requires that *Q* contains a maximally informative true answer (i.e. a true answer that entails all the other true answers).

(10) $[[\text{ANS}]]^{w,c} = \lambda Q_{<st,\,t>} : \exists q \in Q\ [p = \text{MAX}(Q,w)].\text{MAX}(Q,w)$,
where $\text{MAX}(Q,w) = p$ iff $p(w)$ & $\forall q[q \in Q[q(w) \rightarrow p \subseteq q]$

A sample derivation is presented in (11).

(11) [ANS [CP Wer alles ist gegangen]]

a. $[[\text{CP}]]^{w,c}$
$= \lambda p_{<s,\,t>} : \exists q \in S\ [p \geq_S q \ \&\ p \neq q].\ p \in S\ \&\ \forall q' \in S\ [p \geq S\ p']$,
where $S = \{ p : p = \exists x\ [\text{left}(x)\ \&\ \text{person}(x)] \}$

b. $[[\text{ANS}]]^{w,c}([[\text{CP}]]^{w,c}) = \text{Max}([[\text{CP}]]^{w,c}, w)$
Presuppositions
$\exists p \in [[\text{CP}]]^{w,c}\ [p = \text{MAX}([[\text{CP}]]^{w,c}, w)] \ \&\ \exists q \in S\ [p \geq_S q \ \&\ p \neq q]$

Suppose that the strength ranking $_S$ is based on entailment. In that case, the presupposition induced by *alles* requires that the answer should entail another proposition in *S*. The answer like (2-A2) (= “Jenny left”), unlike the answer like (2-A1) (=“Jenny and Sarah left”), cannot satisfy this requirement because it does not entail another proposition in *S*. This leads to a presupposition failure, and the plurality effect arises.

Analysis for *alles* in exclamatives

We see then how our proposal works in exclamatives. Based on Zanuttini and Portner (2003) and Roberts and Sasaki (2021), we define excl operator for exclamatives as in (12).

(12) $[[\text{EXCL}]]^{w,c}$
$= \lambda Q_{<st,\,t>} : \exists p \in Q_c + [p \in Qc\ \&\ p(w)].\ w \in \cap \{p : p \in Q_c +\ \&\ p \notin Q_c\}$,
where Q_c+ is a widened context s.t. $Q_c \cap Q_c+ = Q$ and $Q_c+ - Q_c \neq \emptyset$

The above operator takes a set of propositions *Q*, induces a presupposition that there should be a true proposition in a widened set of propositions Q_c+ (i.e. a set of

surprising / impressive propositions), and gives the truth condition that such a proposition is true. Under these assumptions, the derivation of an exclamative clause with *alles* proceeds as in (13).

(13) [EXCL [CP Wen alles ich getroffen habe!]

a. $[[CP]]^{w,c}$
$= \lambda p$: $\exists q \in S$ [$p \geq_S p$ & $p \neq q$]. $p \in S$ & $\forall p' \in S$ [$p \geq_S p'$],
where $S = \{p : p = \exists x$ [person(x) & met(x)(I) }

b. $[[EXCL]]^{w,c}$ ($[[CP]]^{w,c}$)
$= w \in \cap \{p : p \in Q_c$ + & $p \notin Q_c$
& $p \in S$ & person (x)] & $\forall q' \in S$ [$p \geq_S p'$] }
Presuppositions
$\exists p \in Q_c$+ [$p \in Q_c$ & $p(w)$] & $\exists q \in S$ [$p \geq S$ q & $p \neq q$]

The semantics in (13) correctly predicts that an exclamative clause with *alles* is infelicitous in (4a) and felicitous in (4b) and (5). Suppose that in (4a) and (4b), the strength ranking $\geq_S$ is based on entailment. In this case, the presupposition introduced by *alles* can be satisfied only in (4b):

(14) Suppose *a*= Peter met Georg, *b*= Peter met Maria and *c*= Peter met John. In this case, $\geq_S$ = {<*ab*,*a*>, <ab,*b*>, <ac, *a*>, ...}

a. Context 1 (= (4a))
If $S = \{a\}$, then $\exists q \in S$ [$p \geq_S q$ & $p \neq q$] is false because S contains nothing that *a* entails.

b. Context 2 (= (4b))
If $S = \{a, b, ab\}$, then $\exists q \in S$ [$p \geq_S q$ & $p \neq q$] is true because S contains *a* and *b* that *ab* entails.

Like this, if the strength ranking is based on entailment, the plurality effect arises in exclamative.

In the case of (5), on the other hand, the strength ranking is based on a non-entailment scale. We assume that such a scale is available if each alternative tells a gradable property (e.g. difficulty, impressiveness,etc.) about an individual (cf. Guerzoni and Lim (2007)). In (5), unlike (4a), we can infer the existence of a scale based on impressiveness (i.e., reading "Critique of Pure Reason" is more impressive than reading other books). As a result, the presupposition introduced by *alles* is satisfied as in (15):

(15) Suppose that *a*= I'm reading the "Critique of Pure Reason", *b*= I am reading "New York Times", *c*= I am reading "Harry Potter". In this case, $S = \{\langle a,b\rangle, \langle a,c\rangle, \ldots\}$

If $S = \{a, b\}$ or $S = \{a, c\}$, then $\exists q \in S\ [p \geq_S q \ \&\ p \neq q]$ is true because

S contains *b* or *c* and *a* is more impressive than *b* and *c*.

Thus, if the strength ranking is based on a non-entailment scale, the plurality effect does not arise in exclamatives.

3 Conclusion

In this paper, we propose a unified semantics for *alles*, which imposes on restrictions on a set of possible answers. We explain the seemingly optional plurality effects in questions and exclamatives by using the difference between entailment and non-entailment scales associated with the strength ranking $\geq_S$.

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