Number agreement in reading comprehension: Grammatical and conceptual factors in pronoun vs. verb agreement

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Production studies on number agreement have shown dissociation between the processes underlying subject-verb agreement and those underlying pronoun-antecedent agreement. Specifically, verb-subject agreement is more sensitive to syntactic number features, while pronoun-antecedent agreement is more sensitive to lexico-semantic properties of the referent [1,2]. However, it is not currently known whether this dissociation generalizes beyond the production domain. Here, we present three reading studies which used eye-tracking to investigate number agreement processes in comprehension. The studies exploited the fact that, in British English, a syntactically singular collective noun like “group” can participate in either singular or plural agreement, depending on whether the interpretation is notionally singular or plural.

The first two experiments concentrated on pronoun-antecedent agreement. Experiment 1 used anaphora sentences like (a) where the reflexive “themselves” co-referred with individual nouns (IN) like “captain(s)” or CNs like “group(s)”. Grammatical-number matching was manipulated through the use of plural (match) vs. singular (mismatch) nouns. Whereas mismatching for INs (captain-themselves) resulted in a reliable mismatch-cost in early and late EM measures (first-pass, regression-path, second-pass) it resulted only in late effects (second-pass) for CNs (group-themselves). This suggests that the initial pronoun-agreement process is constrained by conceptual number, but that grammatical number can affect later processes. Experiment 2 used cataphora sentences like (b) where pronouns preceded their antecedents. CNs were used as antecedents, and plural (themselves) or singular (itself) reflexives served as referring expressions. In cataphora, unlike anaphora, the processing of CNs can not start before the processing of agreement, therefore EM measures reflect the processing of both from the earliest processes of lexical access. If morphology modulated the initial computation of agreement but was overridden by later notional processing, we expect to see it in Experiment 2 but not in 1. A reliable mismatch-cost was shown for singular reflexives (itself-groups), but not for plural reflexives (themselves-group). This is consistent with the results of Experiment 1 and supports a model in which noun-pronoun agreement is driven by conceptual rather than grammatical number.

Experiment 3 focused on subject-verb agreement. It used anaphora sentences like (c) in which the CNs were the subjects of verbs in plural, singular or neutral form. Number was also manipulated on the reflexive (themselves/itself). In contrast to the results for pronoun agreement, grammatical mismatching between the verb and CN resulted in relatively early (spillover regression-path) mismatch-cost (group-avoid>group-avoids). In addition the design of experiment 3 allowed us to examine whether number marking of the verb modulated pronoun agreement. The results suggest that the mismatch between verbs and pronouns (avoids-themselves) resulted only in late (second-pass) mismatch-cost. Like in Experiment 1 this suggests that grammatical number agreement may be involved in late reanalysis or wrap-up processes but does not drive the initial noun-pronoun agreement processes.

The results demonstrate the generality of the dissociation between the two types of agreement dependency. These findings will be discussed in relation to recent language production models accounting for the dissociation between grammatical and notional processing of number agreement [1,2].

Examples
(a) The group(s)/captain(s) convinced themselves about helping the soccer player.
(b) After imagining themselves/itself playing in the new gym, the group/s worked hard to build it.
(c) The group hardly expect/s/ed to disappoint themselves/itself in this match.

References