A well-established finding in sentence production is that mismatches in the grammatical number of head and intervening noun phrases (NP) lead to agreement errors on the verb (e.g., Bock et al., 2004). This effect is strongest when the head NP is singular and the intervening NP is plural as in: the key to the cabinets were… Similarly, although ungrammaticality typically causes disruption in measures of sentence comprehension, the disruption is reduced when the intervening NP has a plural feature. Cue-based memory retrieval accounts propose that the increased number of agreement errors in production and the grammatical illusions in comprehension result from successful retrieval of a partially matching NP (Wagers, Lau, & Phillips 2009). An alternative “noisy channel” approach (e.g., Gibson et al., 2013) predicts that in general the more plural features present around agreement formation the more likely comprehenders may erroneously come to believe that the head NP was plural, leading them ultimately to misinterpret the number of the head NP. We tested this alternative with a question-answer paradigm that has been used to probe misinterpretations (Christianson et al., 2001).

Experiment 1 examined whether comprehenders do indeed misinterpret the number of the head noun when plural features are marked on intervening NPs and verbs. 72 participants read sentences that contained a complex subject NP with a singular head noun. The experiment had a 2 (intervening NP: plural vs. singular) X 2 (verb: plural vs. singular) design (see items 1-4 in Table 1). After reading each sentence, participants were asked a question that probed their final numerical representation of the head noun phrase: Was there more than one key? In the experimental items the correct answer to this question was always “no”. Table 1 shows the proportion of “yes” responses. As predicted by a noisy channel model, the presence of one plural feature on either the intervening NP or verb lead to significant misinterpretation, and having a plural feature on both the intervening NP and verb lead to significantly more misinterpretation overall.

Experiment 2 examined this effect in light of cases where the head noun was marked plural. 52 participants read sentences that contained a complex subject with a plural intervening NP. The experiment had a 2 (head NP: plural vs. singular) X 2 (verb: plural vs. singular) design (items 3-6 in Table 1). As in Experiment 1, when the head noun was singular participants were still likely to misinterpret it as plural when a plural feature was present on either the intervening NP or the verb. Interestingly, even when the head noun was plural, a singular verb interfered with the interpretation, suggesting a symmetric effect of misinterpretation due to mismatching number features.

These results show that when a plural feature is present around agreement formation, comprehenders misinterpret the head NP as plural as evidenced by their increased rate of misinterpretation. This effect is stronger when both the intervening NP and the verb have plural features, consistent with a “noisy channel” account of sentence processing. These results suggest that the increased number of agreement errors in production and the illusion of grammaticality in comprehension may result from comprehenders misinterpreting the head NP as grammatically plural.