

# The consequences of number agreement on number interpretation

Ellen Lau<sup>1</sup> • Matthew Wagers<sup>2,3</sup> • Colin Phillips<sup>1</sup>

University of Maryland Linguistics (1) • NYU Psychology (2) • UC Santa Cruz Linguistics (3)

## Agreement attraction in comprehension: independence of combinatorial operations?

- A plural noun can interfere with singular subject-verb agreement, even though it does not head the subject projection:

*The key to the cabinets were on the table.*

- These errors are common in production (Bock & Miller, 1991) and elicit an illusion of grammaticality in comprehension (Pearlmutter, Garnsey, & Bock, 1999).
- We have argued that such 'agreement attraction' in comprehension is due to errors in the cue-based retrieval of number features from memory (Wagers, Lau, & Phillips, in press; Badecker & Lewis, 2007).

**Agreement attraction provides an opportunity to investigate questions about the independence of the multiple processes necessary to combine new material with the prior sentence context.**

## CUNY 2008: Is agreement independent from the analysis of grammatical roles?

- CUNY 2008 (Lau, Wagers, Stroud & Phillips): Does the incorrect analysis of agreement result in an incorrect analysis of subjecthood?
- Production studies show that thematic and conceptual-semantic factors can affect production of agreement (e.g. Thornton & MacDonald, 2003; Vigliocco et al., 1995)
- If agreement attraction reflects a retrieval error, this retrieval could result in reassignment of the subject.



- In fact, reading time results suggested that agreement attraction does NOT result in re-analysis of the subject.
- This result suggests that the formal number features can be retrieved independently of the computation of grammatical roles.

## Current Study: Is agreement independent from the conceptual interpretation of subject number?

- Does the incorrect analysis of agreement result in an incorrect interpretation of the number of the subject?



*The key to the cabinets were...*

## Design & Predictions

Complete complex-NP attraction sentences with plural predicates:

**Control:**  
*The defect in the appliance was surprisingly numerous.*

**Attraction:**  
*The defect in the appliances were surprisingly numerous.*

**Predictions:**

- If the erroneous retrieval of a plural feature in attraction also results in a revised *interpretation* of the subject as plural, readers should incorrectly accept a plural predicate like 'numerous'
- If computing the formal agreement relationship is carried out independently of the subject's conceptual interpretation, readers should correctly reject the plural predicate at the same rate.

## Experiment 1: Controlling for noun number

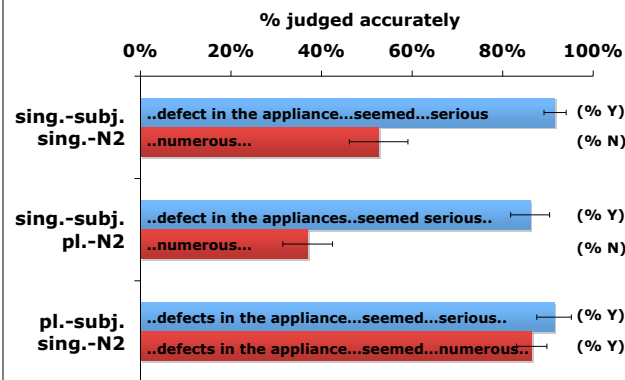
Perhaps just the presence of an embedded plural noun will improve acceptability of plural predicates, regardless of whether a plural verb was present to induce agreement attraction:

*The defect in the appliances appeared to be surprisingly numerous*

If comprehenders are sloppy in this way, our manipulation won't tell us much about agreement computation. Therefore, we began with a control experiment with non-number marked verbs.

**Methods:**

- Speeded acceptability task, following RSVP: 350 ms/word, 2 s for judgment.
- 114 items: 30 experimental items, 84 fillers. 54% gram.; 46% ungram.
- Participants: 24 native speakers; Analysis: Logistic mixed-effect regression



- Main accuracy effect of incongruent predicate ( $p < .01$ ), apparently due to yes-bias in this task (Wagers et al., 2008).
- Main effect of plural N2 ( $p < .01$ ), perhaps due to inherent complexity of processing plurals (Wagers et al., in press).
- However, no interaction; plural N2 does not selectively improve acceptability of plural predicates ( $p > .1$ ).

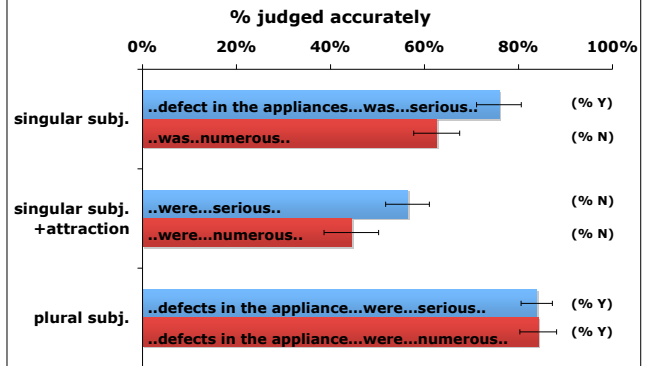
## Experiment 2: Agreement attraction

- Experiment 1 showed that a plural embedded NP by itself does not improve acceptability.

- Critical question: when combined in an attraction configuration with a plural verb, does the agreement attraction result in a plural subject interpretation?

*The defect in the appliances were surprisingly numerous.*

**Methods:** Same as Exp. 1, with number-marked verbs.



- Main effects of attraction ( $p < .01$ ) and incongruent predicate ( $p < .05$ ); since these items were unacceptable, lower accuracy consistent with yes-bias in task.

- However, no interaction between predicate and attraction ( $p > .1$ ); attraction does not selectively improve acceptability of plural predicates

## Conclusions

- The grammatical illusion of the plural verb being acceptable is not linked to a plural interpretation of the subject.
- Previous work suggests agreement attraction is also not linked to misinterpretation of the subject role.
- Under the view that agreement attraction in comprehension is due to errors in cue-based retrieval at the verb, these findings converge in suggesting that **single features of a constituent can be retrieved to satisfy licensing requirements without forcing realignment of tightly linked relationships.**
- However, thematic, conceptual, and agreement information likely can interact when they are simultaneously available, as in production.

## References

- Bock & Miller, 1991. *Cognitive Psychology*.  
 Badecker & Lewis, 2007. Talk presented at CUNY, San Diego.  
 Pearlmuter, Garnsey, and Bock, 1999. *Journal of Memory and Language*.  
 Wagers, Lau & Phillips, in press. *Journal of Memory and Language*.  
 Lau, Wagers, Stroud, & Phillips, 2008. Talk presented at CUNY, Chapel Hill.  
 Wagers, Lau, & Phillips, 2008. Poster presented at CUNY, Chapel Hill.  
 Thornton & MacDonald, 2003. *Journal of Memory and Language*.  
 Vigliocco, Butterworth, & Semenza, 1995. *Journal of Memory and Language*.