The Role of Shallow Processing in Agreement Attraction

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BACKGROUND & QUESTION

▶ Lago et al. (2018) demonstrated agreement attraction effects in Turkish using Genitive-Possessive constructions, as in (1).

(1a) *[[Ressam-lar-ın gen] rakibi-i poss] atölyeden hızla uzaklaştı-lar.
painter-PL-GEN rival-POSS from.the.studio quickly walked.away-PL

(1b) Ressam-lar-ın rakib-i atölyeden hızla uzaklaştı. [PL-SG]

(1c) * Ressam-ın rakib-i atölyeden hızla uzaklaştı-lar. [SG-PL]

(1d) Ressam-ın rakib-i atölyeden hızla uzaklaştı. [SG-SG]

▶ THEIR HYPOTHESIS: Retrieval as Repair

When there is a violation in subject-verb agreement (1a, 1c), participants check for a plural NP they may have overlooked. If the attractor is marked with the genitive **(no inhibition)** and matches the verb in terms of number information, it may be erroneously retrieved as the controller.
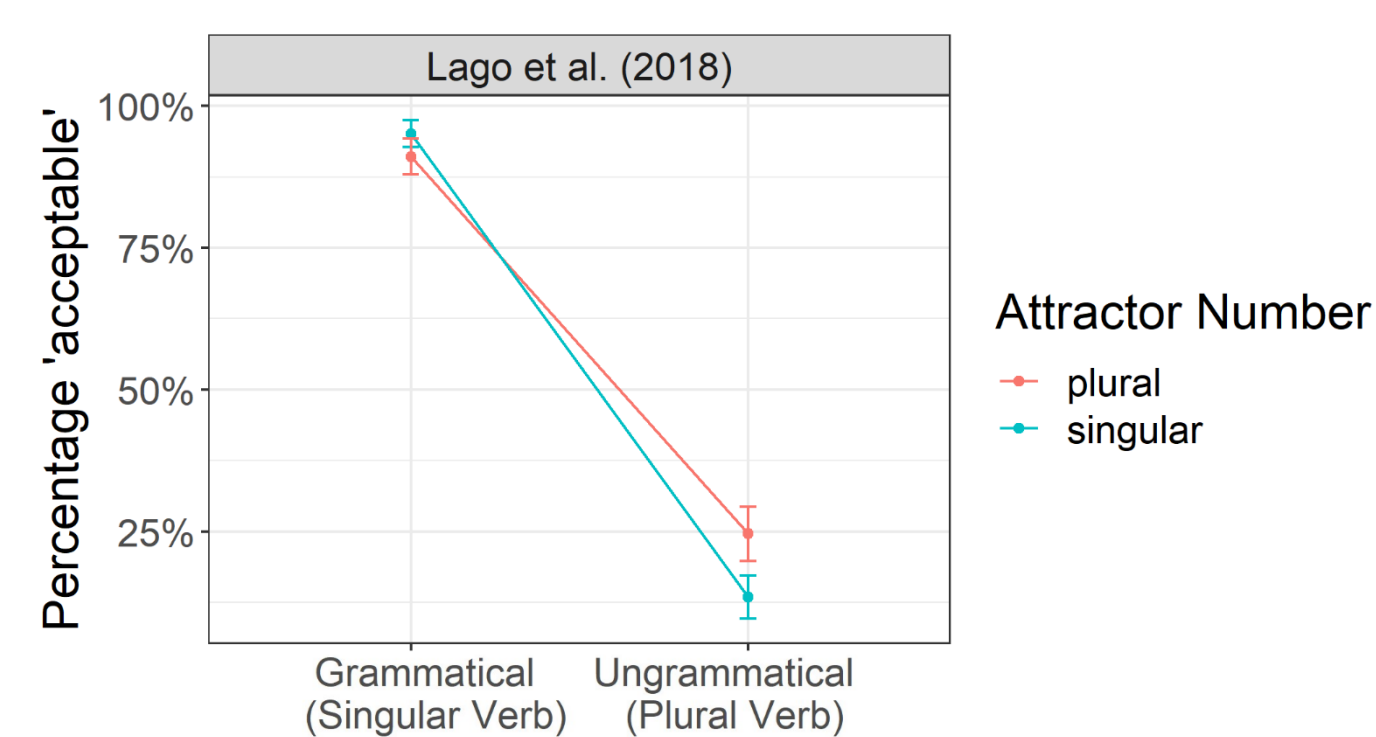
CASE AND INHIBITION

● Nicol et al. (2016): Genitive attractors trigger agreement attraction in English. They used sentence fragments, as in (2a) and (2b), and found no effect in a production experiment.

(2a) The elf's house with the tiny windows was/were …

(2b) The elves' house with the tiny windows was/were …

● Lago et al. (2018): The genitive case should trigger such effects in Turkish; it marks embedded subjects in Turkish. Thus, genitive NPs were hypothesized to a priori be likely agreement controllers.

(3) [Öğrenciler-in geldiğini] biliyorum.
students-GEN came.that I.know
"I know [that **students** came]."

LAGO ET AL. (2018) RESULTS

POTENTIAL CONFOUND IN LAGO ET AL. (2018)

● All subject heads in Lago et al. (2018) are morpho-phonologically ambiguous between accusative and possessive:

(4) rakib-i
rival-POSS/ACC

● Agreement attraction effects in Turkish can be modulated by the ambiguity of the head subject.

● How do we test whether or not agreement attraction in Turkish is due to local ambiguity between the accusative and the possessive marking: By disambiguating the case using vowel-ending words, as in (5a) and (5b):

(5a) abi-si   (5b) abi-yi
brother-POSS   brother-ACC

EXPERIMENT 1: ACCUSATIVE INHIBITION

● OUR HYPOTHESIS: Effect of Case Inhibition in Shallow Processing

— In a shallow processing state, the retrieval of the agreement controller is inhibited, and thus the attractor is erroneously retrieved as the controller. This inhibition is due to the local ambiguity on the head subject.

— We expected that disambiguating the case would result in no agreement attraction effect if the agreement attraction effects were modulated by the case ambiguity.

● The number morphology on the verb and the attractor were manipulated as in Lago et al. (2018).

● We replaced the subject heads with unambiguous nouns and changed the parts of the experimental items minimally when necessary due to plausibility.

● We used word by word centered presentation in RSVP format (400ms/word).

● 108 native Turkish speakers; 40 items; 40 filler sentences

(6a) *[[Marangoz-lar-ın gen] abi-si poss] atölyeden hızla uzaklaştı-lar.
carpenter-PL-GEN brother-POSS from.the.studio quickly walked.away-PL

(6b) Marangoz-lar-ın abi-si atölyeden hızla uzaklaştı. [PL-SG]

(6c) * Marangoz-un abi-si atölyeden hızla uzaklaştı-lar. [SG-PL]

(6d) Marangoz-un abi-si atölyeden hızla uzaklaştı. [SG-SG]

● Bayesian hierarchical model of yes responses with ungrammaticality, the attractor number, case ambiguity, and their interactions as predictors.

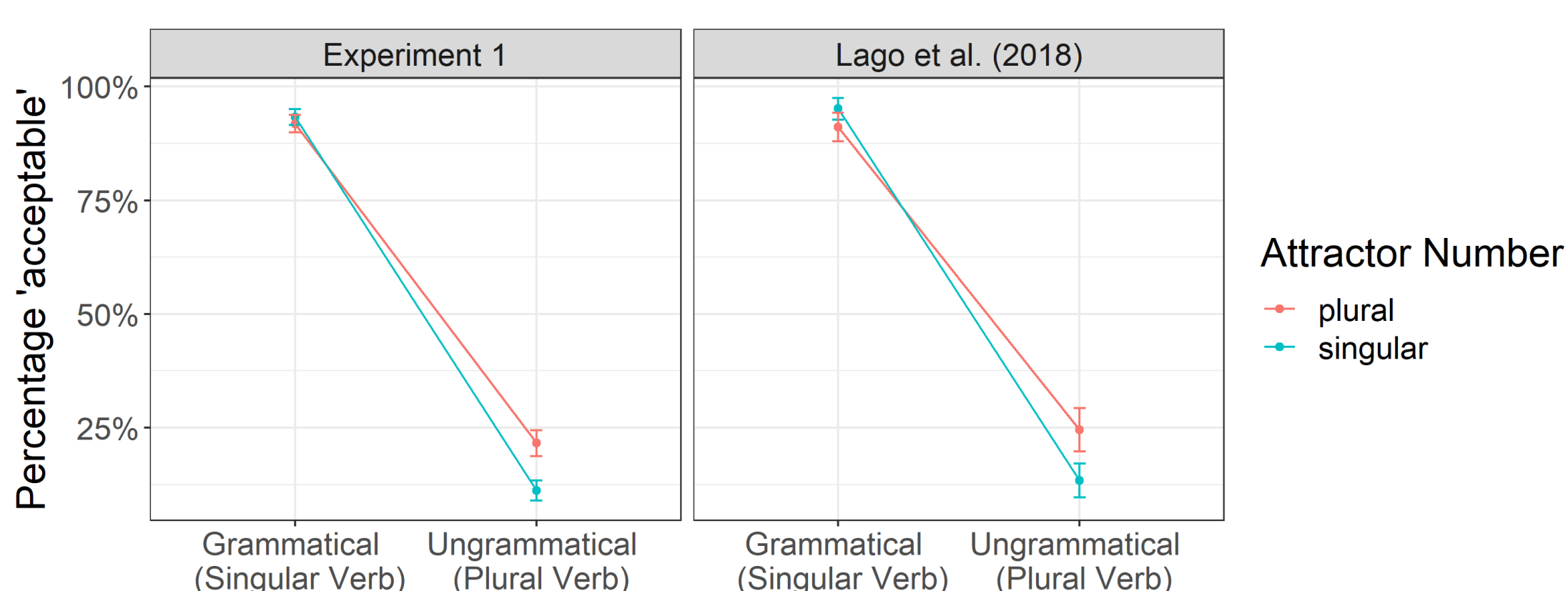● By-item and by-participant slopes and intercepts for all predictors.

Fig1: Average percentages of 'acceptable' responses in Experiment 1 and Lago et al. (2018). Within-subject 95% confidence intervals as error bars (Cousineau, 2005; Morey, 2008).

RESULTS OF EXPERIMENT 1 & DISCUSSION

BAYESIAN GLM

● Positive interaction between sentence grammaticality and attractor number.

● No clear evidence for a three-way interaction between the presence of ambiguity, sentence grammaticality, and attractor number.

→ This invalidated our hypothesis with regards to accusative inhibition.

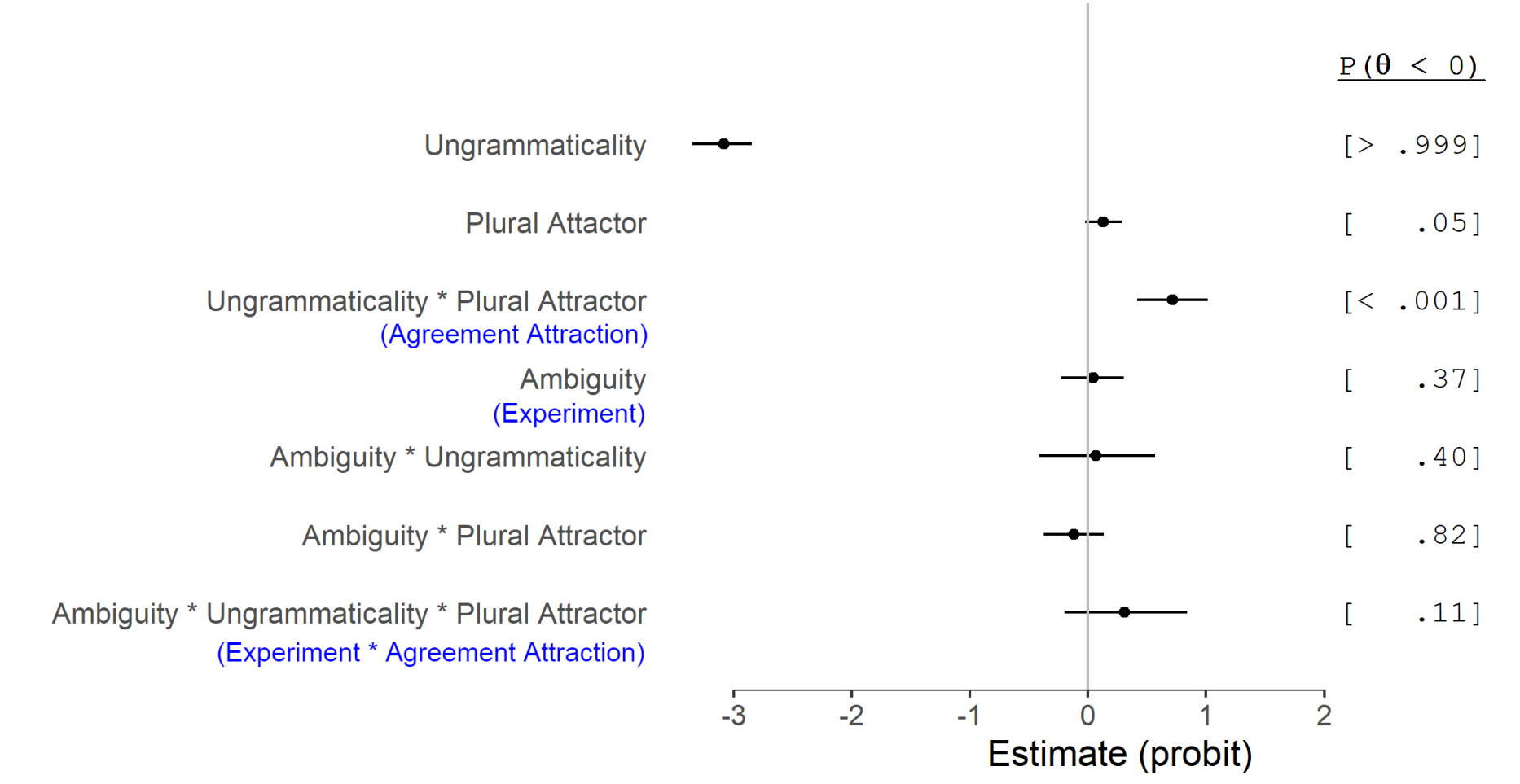→ The findings of Lago et al. (2018) are not due to accusative-possessive ambiguity.

Fig2: A Bayesian GLM assuming a Bernoulli distribution with a probit-link function was fit to participants' 'acceptable' responses. Estimates and 95% credible intervals for the regression coefficients.

EXPERIMENT 2: TASK-SPECIFIC STRATEGIES

● OUR HYPOTHESIS: Form-Driven Processing in Shallow Processing

— Without enough information to judge the acceptability of a sentence, participants may classify it as acceptable if they recall seeing the plural morpheme –lar/–ler.

— We made use of the morpho-orthographic ambiguity between the nominal plural and the verbal plural marker, both of which have the same form in Turkish.

— We expected comparable agreement attraction effects with a verbal attractor if subjects indeed used forms as a cue for agreement processes in a shallow processing state.

● We used the verbs of object relative clauses as attractors.

● The number morphology on the verb and the attractor were manipulated.

● Word by word centered presentation in RSVP format (400ms/word).

● 79 native Turkish speakers; 40 items; 40 filler sentences

(7a) *[[Gör-dük-ler-i RC] marangoz atölyeden hızla uzaklaştı-lar.
see-NMLZ-PL-POSS carpenter from.the.studio quickly walked.away-PL

(7b) Gördük-ler-i marangoz atölyeden hızla uzaklaştı. [PL-SG]

(7c) *Gördüğ-ü marangoz atölyeden hızla uzaklaştı-lar. [SG-PL]

(7d) Gördüğ-ü marangoz atölyeden hızla uzaklaştı. [SG-SG]

● Bayesian hierarchical model of yes responses with ungrammaticality, the attractor number, case ambiguity, and their interactions as predictors.

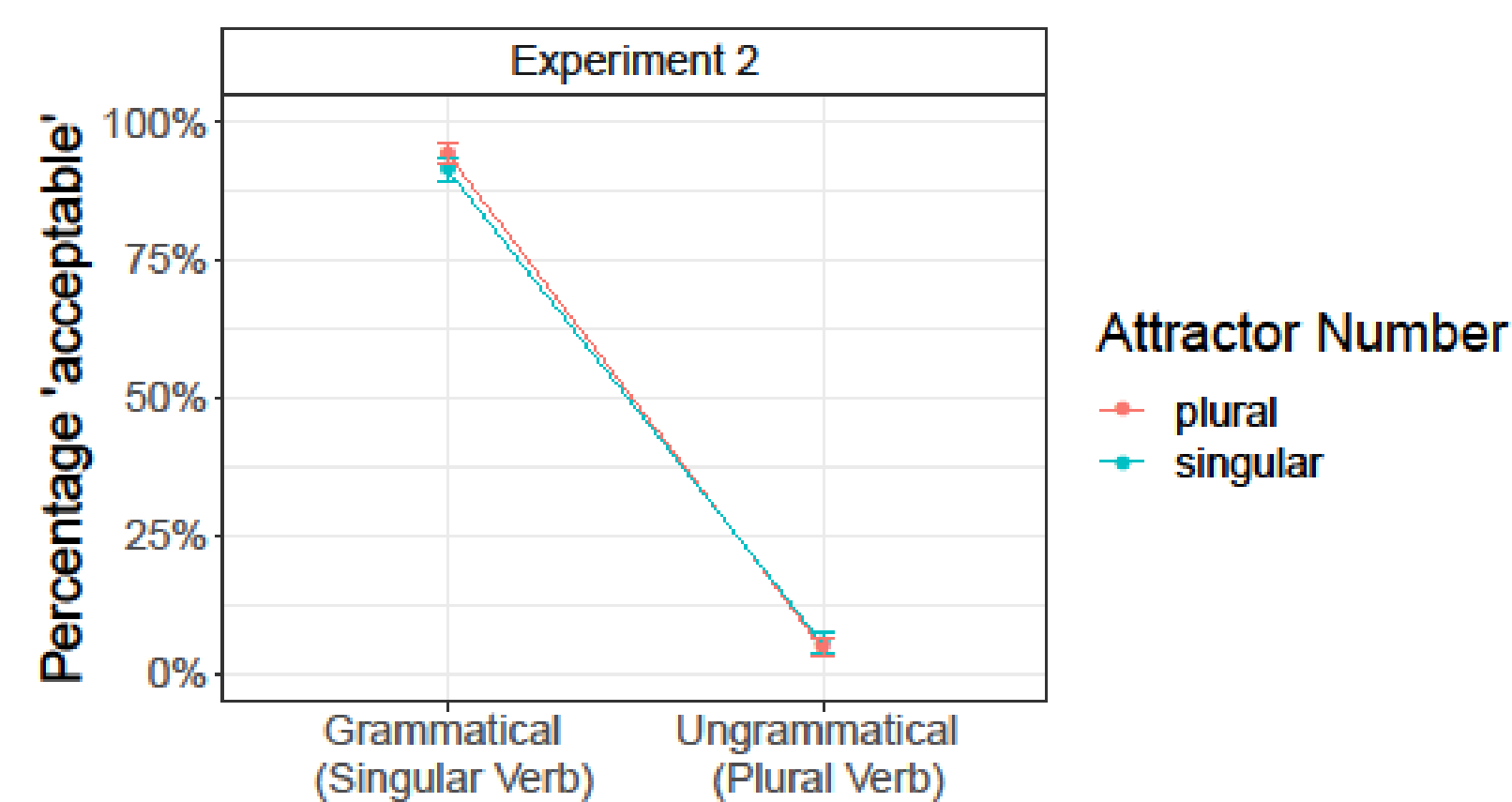● By-item and by-participant slopes and intercepts for all predictors.

Fig3: Average percentages of 'acceptable' responses in Experiment 2. Within-subject 95% confidence intervals as error bars (Cousineau, 2005; Morey, 2008).

RESULTS OF EXPERIMENT 2 & DISCUSSION

BAYESIAN GLM

● Negligible interaction between sentence grammaticality and attractor number.

● Negative three-way interaction between the presence of verbal attractor, sentence grammaticality, and attractor number.

→ Verbal attractors did not cause illusionary agreement in Turkish.

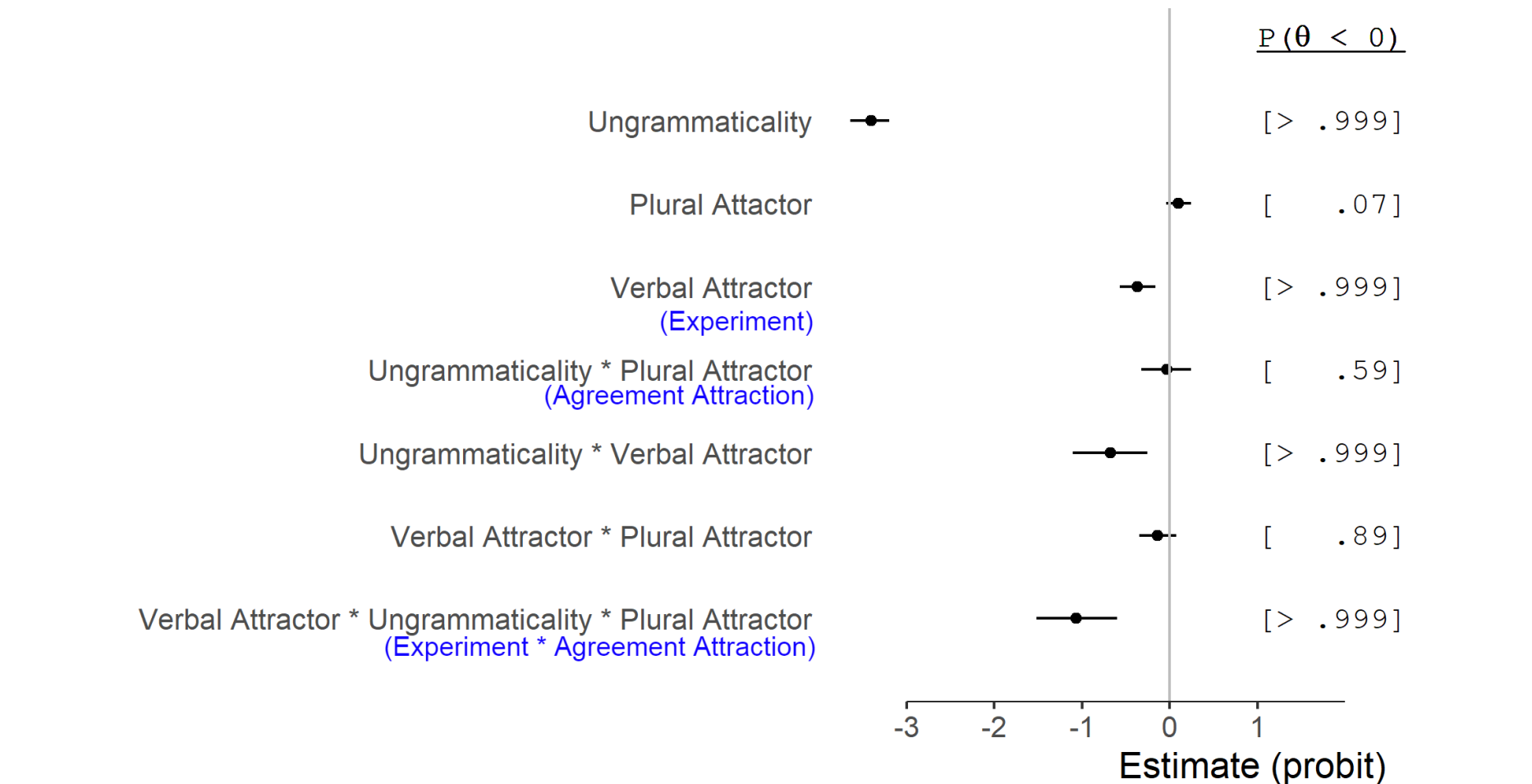→ Reduced effect of agreement attraction in Experiment 2 compared to Experiment 1.

Fig4: A Bayesian GLM assuming a Bernoulli distribution with a probit-link function was fit to participants' `acceptable' responses. Estimates and 95% credible intervals for the regression coefficients.

CONCLUSION

▶ Agreement attraction is not modulated by accusative-possessive case ambiguity.

▶ Form-driven strategies are also excluded as a result of Experiment 2.

▶ The surface strings are not what participants pay attention to.

▶ Agreement attraction occurs at the abstract feature level.

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