Reassessing the grammaticality asymmetry in agreement attraction: An ROC analysis

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Motivation:
Does agreement attraction have an encoding or access based source?
Does this differ by construction? We use the grammaticality asymmetry to compare these sources with PPs and ORCs, applying methods from Signal Detection Theory.

Findings:
We can decompose attraction into two sources: an encoding source, which effects all trials, and an access source, affecting a subset of ungrammatical trials. This is the same for both PP and ORC configurations.

Study Design
1. **Match:** Alex lost the phonebook to the lawyer for the company that often use(s)
2. **PP Mismatch:** Alex lost the phonebook to the lawyer for the companies that often use(s)
3. **ORC Mismatch:** Alex lost the phonebooks to the lawyer for the company that often use(s)

- E1: N = 84 in lab at UMass; E2 (replication): N = 42 online using Prolific
- 120 experimental items (15 obs/cond/Ss) with 70 fillers with a variety of agreement errors
- Preregistration and full details can be found at https://osf.io/chm6y/

Word-by-word presentation
- Speeded (2s) binary judgment
- Three-point confidence rating

Grammar asymmetry + bias

- Attraction effects: Mismatch effects in both ORCs and PPs in both grammatical and ungrammatical sentences
- Grammaticality asymmetry: Larger effects in ungrammatical compared to grammatical sentences
- Little bias on average: Match conditions are comparable, but a correlation can be observed between bias and the grammaticality asymmetry:

ROC Analysis
- Judgment + confidence rating transformed to 6-point scale
- Empirical ROC, z-transformed response proportion for each point on the scale for each condition (y-axis) against response proportions for ungrammatical match (x-axis)
- SDT Model Fit: Fit separately to PP and ORC conditions (dotted line and "+" signs)
- From model, get measure of sensitivity to acceptability, dₐ (roughly equal to area under curve) and variability (slope)

Future Directions:
- Test PP and ORC configurations in separate constructions. Do the same results obtain?
- Form an explicit model where both encoding and access-based sources exist.

Acknowledgments + References

Thanks to our colleagues in the Joint Labs Meeting at UMass Amherst for feedback. Hammerly is supported by NSF GRFP DGE-1451512.

References:
- Eberhard et al. (2005) Making sense of syntax: number agreement in sentence production. Psychological Review

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