INTRODUCTION

What can semantic ambiguity reveal about underlying language processing mechanisms?

Heuristic vs. algorithmic processing (Ferrera, 2003; Fodor, 1982)

- Examine Quantifier Scope Ambiguity
- Every N1 Verbed a N2

Two possible meanings:

- Meaning determined by the order of interpretation of quantifiers (i.e. scope)

METHOD

Surface scope interpretation: consistent with linear order

Inverse scope interpretation: consistent with linear order

i) $\forall x (x \text{ is a kid}) \rightarrow \exists y (y \text{ is a tree} \land x \text{ climbed } y)$

ii) $\exists y (y \text{ is a tree} \land \forall x (x \text{ is a kid} \rightarrow x \text{ climbed } y))$

The PRESENT STUDY

Interpretation of QSA sentences examined across 2 experiments (see Dwivedi, 2013 for Exp 1)

- Experiment 1, QSA context sentences heavily biased for plural interpretation, all trials have questions
- Experiment 2, QSA context sentences heavily biased for plural interpretation with "pre-context," all trials have questions.

Predictions

- The addition of questions and biased stimuli should facilitate algorithmic processing in Exp 1, that is, empirical difference between AS vs. CS but not AP vs. CP should be observed.
- Furthermore, the addition of "pre-context" should allow for interpretation of "Every," further facilitating grammatical interpretation (same empirical prediction).
- On the other hand, if participants are processing such sentences heuristically, then only cues relevant to context are expected to affect interpretation interpretation: Exp 1 cue is Number, Exp 2 cue is Ambiguity.

PREVIOUS FINDINGS

- Relies on number interpretation
- Previous work (Kurzman and MacDonald; 1993) showed that the plural interpretation was preferred.

- However, a recent ERP study by Dwivedi et al. (2010) showed no preference for plural vs. singular interpretation
- See midline ERP recordings at Verb in Continuous sentence
- Shallow processing of QSA sentences, i.e., algorithmic computation did not apply immediately
- CS? Also QSA (see Barker 2007, Carlson, 1987)
- In addition, an off-line norming experiment was included where 32 participants circled the most appropriate continuation sentence
- Questionnaire was 160 ambiguous sentences, 80 unambiguous sentences, & 80 fillers

RESULTS

- No main effects associated with Context or Number (F(2))
- Significant interaction of Number x Words (F(3), 250) = 9.54, MSE = 606; $p < 0.01$; $\eta^2$ = 0.17

- Evidence of heuristic "good enough" processing: normative max (see Dwivedi & Curtiss, 2015)

CONCLUSION

- Semantic ambiguity as exhibited in Quantifier Scope Ambiguous sentences allows for the unique opportunity of distinguishing between two classes of language processing mechanisms
- At first glance conclude that language processing is a heuristic first, algorithmic second mechanism (Dwivedi, 2013)
- However, recent analyses indicate that individuals differ in terms of their primary processing strategy.

SELECTED REFERENCES

- Lawerence Erlbaum Associates.
- Cognitive Brain Research, 17, 423–437.