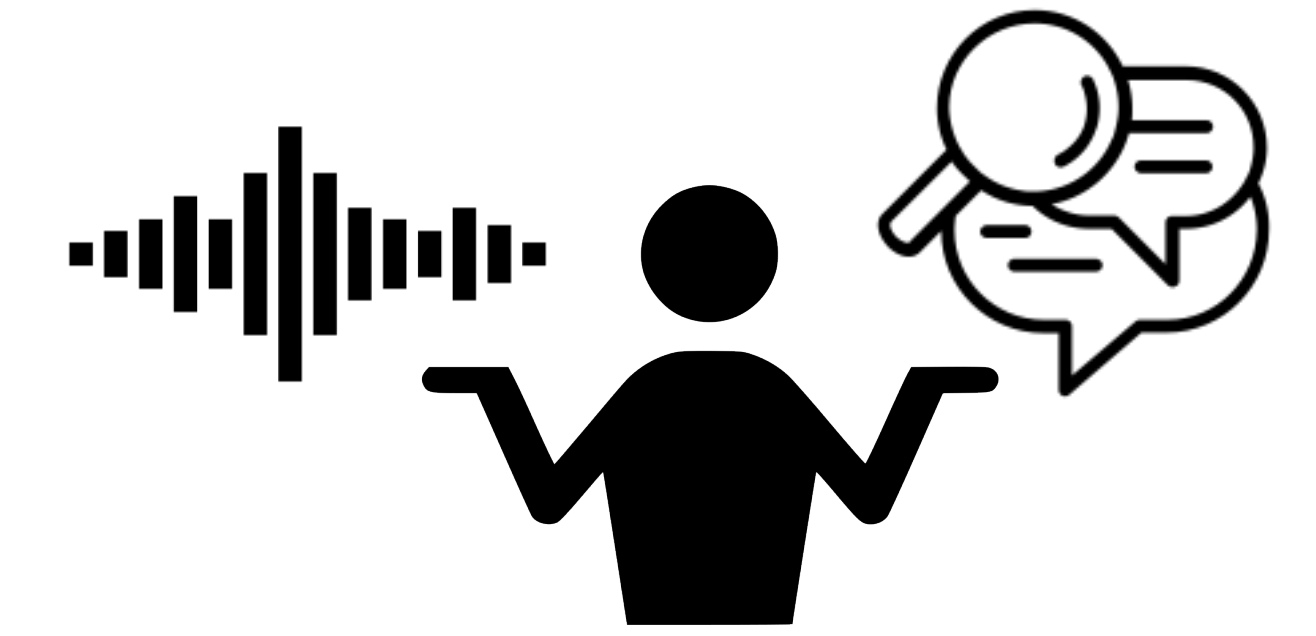




Which is more effective in disambiguation: Prosody or Context?

Evidence from parsing empty category in garden path sentences



INTRODUCTION

Psycholinguistic research on sentence processing has focused overwhelmingly on the resolution of syntactic ambiguity. The general view on sentence processing agrees that syntax plays a fundamental role in sentence comprehension that cannot be subsumed by other levels of processing (e.g. lexical, discourse), and there are strong interactions with context and prosody (Frazier, 1979; Fodor, 2002). Studies have shown that prosodic cues and context are both effective in resolving ambiguity in garden path sentences. The role of prosody and context in parsing syntactic ambiguity has been used to argue for two sentence interpretation framework respectively.

Prosodic cues — Syntax first model

The prosodic cues have been used to prove that parsers use syntactic principles to build an initial interpretation of the sentence. Prosodic manipulation on pause and vowel lengthening could help parsers to identify syntactic structures based on prosodic patterns, thus build an syntactic representation of the sentence (Price, Ostendorf, Shattuck-Hufnagel and Fong, 1991).

Context cues — Meaning first model

The context cues have been used to demonstrate that parsers could ignore syntax and build interpretation of the sentence based on lexical association. Discourse context could help parsers favor a syntactic structure whose meaning is supported by the context (Ni and Crain, 1990; Altmann, Garnham and Dennis, 1992).

This study: Which one is more effective?

The debate of these two sentence processing frameworks have been going on for decades; however, there is no research comparing the effectiveness of prosody and context in disambiguating syntactic structures in one sentence processing task. This study is trying to evaluate the effectiveness of prosodic cues and context cues in solving temporal syntactic ambiguity.

Test Material: Who does John want to kiss Kate?

This is a **garden path sentence** that most parsers would think this sentence is ungrammatical at first sight and understand the true meaning after re-reading. The source of garden path ambiguity is the **empty category** in between “want” and “to” (Fodor, 1989). An empty category in this case can be understood as a leftover grammatical constituent. Before wh-fronting, the question would be “John wants who to kiss Kate?”. After wh-fronting, “who” left an empty trace in between “want” and “to”.

METHODOLOGY

PARTICIPANTS:

Native English speakers; College students; N = 23

PROCEDURE:

They sat in front of a Tobii eye tracker. They saw sentences on the screen and asked to click “Yes” or “No” if the sentence is grammatical/natural/correct.

There are three conditions: control, prosodic cues and context cues.

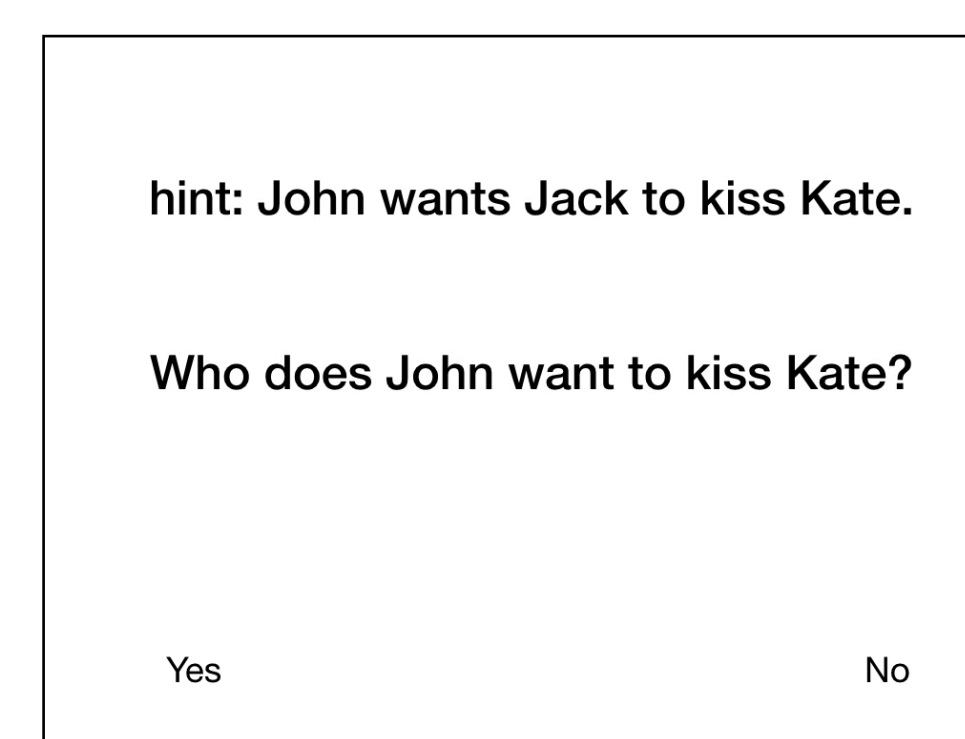
Control: seeing the sentence on the screen



Prosodic cues: seeing the sentence as well as hearing the sentence read to them



Context cues: seeing the hint sentence as well as the target sentence at the same time



Post-experiment Questionnaire:

While participants completing grammaticality judgement test on the screen, a researcher also circled their answers the questionnaire. After the participant finished the experiment on eye-tracker, the researcher would ask them to correct the sentences that they clicked “No” during eye-tracking experiment.

CONCLUSION

| | Control | Prosodic Cues | Context Cues |
|---------------------------|---------|---------------|--------------|
| Offline Processing | | | |
| GJT scores | 0.65 | 0.78 | 0.43 |
| Online Processing | | | |
| Fixation | 0.26 | 0.61 | 0.42 |
| Regression | 12.77 | 11.04 | 14.68 |

1. GJT scores: Prosodic Cues > Control > Context Cues
2. Fixation score: Prosodic cues > Context cues > Control
3. Regression score: Prosodic cues > control > context cues

Overall:

The preliminary data analysis showed that participants had better performance in prosodic cues conditions than context cues conditions in both off-line and online processing.

(In short, prosodic cues are more effective than context cues).

Discussion:

1. Why GJT scores even lower than chance in context cues condition?
2. In the post-experiment questionnaire, there are two ways to correct the most commonly judged wrong garden path sentence: a. “Who does John want to kiss, Kate?” b. “Who does John want to kiss ~~Kate~~?”
This indicates that parsers have a strong inclination for “want to/wanna” structure. It also supports the syntax-first parsing model.

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