Dependency-length effects in Japanese gapless relative clauses

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The length/locality effects

- The parser takes more time to process sentences with long dependencies. (Gibson, 1998, Grodner & Gibson, 2005, etc.)
- [1] The administrator [who the nurse (who was from the clinic) supervised] the medic.
- Such length/locality effects do not show up in some head-final languages (German, Hindi, Japanese, etc.; March & Lewis, 2006, Konieczny, 2000).
- Dependencies with wh-phrases and NPIs exhibit length effects, but not those with referential NPs (Nakatani & Gibson, 2008, Ono & Nakatani, 2010).

Self-paced reading study

- Participants: 30 Japanese students (4 eliminated, due to their test accuracy rate, < 66%)
- Materials: 26 sets of target sentences (4 eliminated due to low accuracy rate, < 66%); 50 filler sentences.
- Results: Sentence processing system handles quantificational and referential elements to the dependency length, showing that Hypothesis 1 put forward by Ono & Nakatani is supported.

Experiment 1: NP-NOM vs. NP-ACC

- Constraint: "the landlady-NOM [landlady-NOM  the sentence processing system handles quantificational and referential elements to the dependency length, showing that Hypothesis 1 put forward by Ono & Nakatani is supported."
- Length effect: Pronoun-in-NP-ACC RC was easier to process than Pronoun-in-NP-R.

Discussion

1. What is the source of the length effects?

- The dependency between a universal quantifier and a bound pronoun is sensitive to the dependency length, showing that Hypothesis 1 put forward by Ono & Nakatani (2010) is supported.
- Wh-phrases and NPIs showed length effects, but that was probably not because they require the verb to have a specific form for the licensing purpose; they show the length effects because they are quantificational elements.
- The current result suggests that the working memory system which interacts with the sentence processing system handles quantificational and referential elements in some different manners (cf. Gibson, 1996).
- This reflects the processing cost of the parser retrospecitively searching for the dependent element (i.e., pronoun) after it sees an RC head.

2. What is the source of the subject RC preference?

- Miyamoto & Nakamura (2003) found that Pronoun-in-NP-ACC RC was easier to process than Pronoun-in-NP-R.
- There are various possibilities accounting for such a preference. Discourse (Roldan, et al., 2012): SRC can be used without context. Predictability (Miyamoto & Nakamura, 2003): The RC structure is predicted earlier for SRC. Thematic Role Assignment (Nakamura & Miyamoto, 2012): In SRC, the object receives its thematic role earlier than the subject. Those are factors caused by a missing NP in the RC that may mask the processing cost at the head noun for establishing the dependency. Since there is no missing NPs in those RCs (no real "gap"), there would be no predictability difference nor ambiguity; hence the current paradigm is free from the confounds mentioned above.

This suggests that previous results may have resulted from the difference based on the predictability of the RC structure.

References


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