Word-by-Word Grammaticality Decisions vs. Whole-Sentence Grammaticality Decisions in Sentence Processing

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Introduction

- The focus of the present study was to determine how a word-by-word grammaticality deicsion task compares to a more traditional whole-sentence grammaticality decision task.
- Of the small number of on-line sentence presentation methods, few require the in-depth processing that the word-by-word grammaticality task requires (Ni, Crain, Shankweiler, 1996). As each word of the sentence is presented, individuals must consider in detail the information which has been presented the word(s) prior.

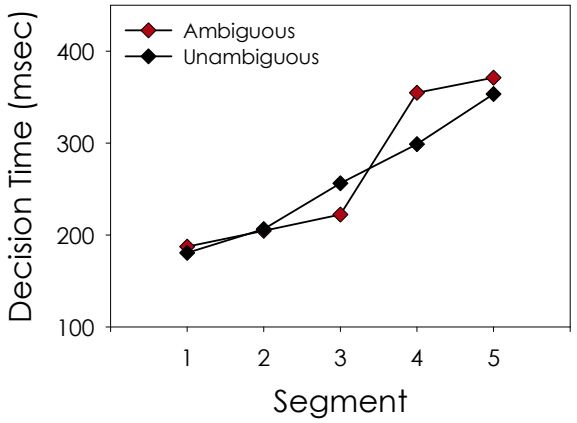
Methods

- **Grammaticality Decision Tasks**
  - The word-by-word grammaticality decision task for the study was the 'stop making sense' embedded within a word-by-word reading paradigm from Ni, Crain, and Shankweiler (1996).
    - This task requires individuals to read individual sentences in an unfolding word-by-word display format and decide, following the presentation of each word, whether or not the sentence continues to make sense.
    - A 'no' response indicates that the sentence has 'stopped making sense'.
  - The whole-sentence grammaticality decision task required individuals to read the sentences in their entirety and then decide whether or not the sentence made sense.
  - A comprehension question querying about the sentence interpretation followed the presentation of each sentence.

- **Sentence Materials** (from Ni, Crain, et al., 1996)
  - Sentences in the tasks were temporarily ambiguous or unambiguous with respect to the interpretation of the main verb in the sentence.
  - Temporarily ambiguous sentences are typically more difficult for individuals to process because the parser pursues an initially incorrect analysis.
    - **Temporarily Ambiguous**
      - The businessmen loaned money at low interest were told to record their expenses.
    - **Unambiguous**
      - The vans stolen from the parking lot were found in a back alley.

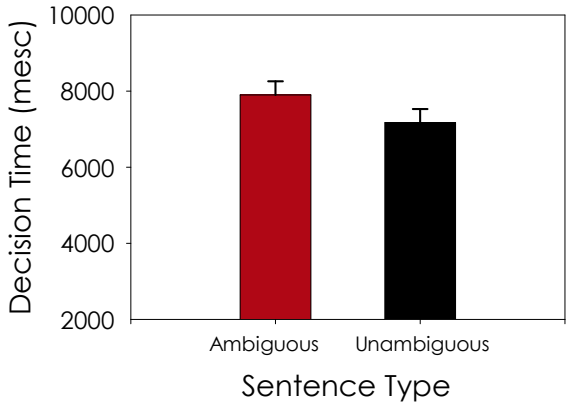
Results

Word-by-Word Grammaticality Decisions

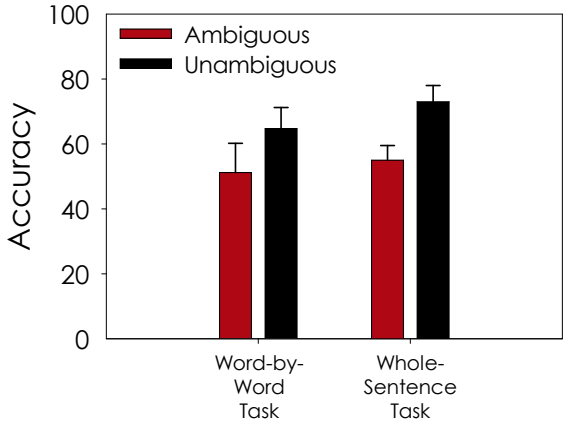


	Sentence Region	Sentence Constituent
1	Subject NP	The businessmen
2	First verb (ambiguous in test sentences)	loaned
3	Remainder of 1st verb (except last word)	money at low
4	Last word in 1st verb phrase	interest
5	AUX verb & Main verb -or- Main verb + next word	were told
6	Remainder of sentence minus final word	to record their
7	Last word–Not analyzed	expenses

Whole-Sentence Grammaticality Decisions



Question Comprehension Accuracy



Summary

- **Measuring On-Line Comprehension**
  - Measuring sentence processing in real time is a challenge that psychology of language researchers continue to face.
  - Methods such as fMRI and ERP have increased in availability and use, however these techniques remain accessible to a minority of language researchers.
  - Inexpensive and non-invasive techniques of computer-based presentation and key press responses to sentences presented word-by-word remain a methodologically sound and viable complement to fMRI and ERP techniques.
- **Grammaticality Decision Tasks**
  - Although both the word-by-word and whole-sentence grammaticality decision tasks were sensitive to people's intuitions about ambiguous sentences, only the word-by-word task provided a break down of processing across the sentence.
  - The word-by-word task illustrates more clearly where within the sentences individuals had specific processing difficulties.
  - Question comprehension accuracy was best for the whole-sentence condition—reflecting perhaps that a word-by-word method may disrupt extraction of sentence meaning.