Processing of telic and atelic events: Evidence for the partial interpretation hypothesis

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We present results from a complex span experiment demonstrating that the left-to-right incremental parser commits to a telic interpretation as soon as it encounters an *in-X-time* adverbial but that it delays interpretation of the event until the end of the sentence when it encounters a *for-X-time* adverbial. These results suggest that the parser only makes semantic commitments when necessary.

Background English events can be described as telic (i.e., having an endpoint), e.g., *Peter died*, or as atelic, e.g., *Peter loves Mary*. However, there are predicates that are compatible with both interpretations, i.e., scalar predicates such as *The wife ironed the clothes*. Giorgi and Pianesi (2001) show that the distinction between the two event types can be diagnosed using *in-X-time* (telic events) and *for-X-time* (atelic events) adverbials. However, while *in-X-time* is only compatible with a telic interpretation, *for-X-time* does not appear to pose any such interpretation restriction (cf. Stockall and Husband, 2014 for psycholinguistic evidence that atelic predicates pattern with unspecified events). We argue that these adverbials can be used as a tool to test for how telic and atelic events are interpreted in real-time processing. According to the **immediate partial interpretation hypothesis** (Frazier and Rayner, 1990), the parser commits to an interpretation only when necessary and can delay semantic commitments until later in the sentence. The parser is therefore expected to commit to a telic interpretation of an event as soon as an *in-X-time* adverbial is encountered but to postpone making a semantic commitment after encountering *for-X-time*.

Design In complex span tasks (Daneman and Carpenter, 1980), working memory is measured using a dual task: i) a set of sentences is processed; and ii) words are encoded after each sentence. Lower recall of lists of encoded words reflects higher processing load. We used a novel variant of the task (Chapman et al., In progress) in which memory words are presented within the sentences, enabling the investigation of local effects. Stimuli consisted of scalar predicates compatible with both types of adverbials. To test for differences in how the parser makes semantic commitments, we manipulated the syntactic location of the adverbial: after the verb phrase (VP), (1), or at the beginning of the sentence, (2). Memory words appeared in three locations, as in (1)-(2).

(1) The wife ironed the clothes **WORD 1** {in/for} two hours **WORD 2** at the house. **WORD 3**

(2) {In/for} two hours **WORD 1** she ironed the clothes **WORD 2** at the house. **WORD 3**

Predictions Following the partial interpretation hypothesis, we predicted lower recall when memory words followed phrases that force the parser to make a semantic commitment. Specifically, when the adverbial occurred at the beginning of the sentence, we expected recall to be lower after the adverbial, e.g., WORD 1 in (2), for *in-X-time* because it has a unique interpretation, compared to *for-X-time*. As *for-X-time* allows multiple interpretations, a semantic commitment is not necessary until the whole sentence has been read, predicting lower recall scores at WORD 3 in (1)-(2).

Results For sentences containing *in-X-time*, recall was less likely after the adverbial compared to after the sentence ($p < 0.01$) and after the VP ($p = 0.03$). There was also an interaction between word location and adverbial position: while recall was overall less likely after the adverbial compared to after the sentence, this effect was stronger when the adverbial appeared first ($p = 0.01$), e.g., in (2) compared to (1). Thus, recall was more difficult when the parser could commit to an interpretation early on, i.e., when the adverbial preceded the VP. For conditions containing *for-X-time*, recall was less likely after the sentence compared to after the VP ($p < 0.01$) and adverbial (NS). The interaction between word location and adverbial position was not significant, suggesting that recall in sentences with more than one interpretation was overall more difficult at the end of the sentence. The partial interpretation hypothesis is again supported: the parser does not commit to an interpretation until the entire sentence has been read, incurring processing difficulty.

References

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