

Syntactic priming disambiguates globally ambiguous sentences in language comprehension

Syntactic priming is the repetition of a syntactic structure from one utterance to the next, independent of non-syntactic similarities between the utterances. Classic research by Bock (1986) first demonstrated syntactic priming in language production. However, although these effects are robust in language production, they are thought to be much weaker (or non-existent) in comprehension (for review see Pickering & Ferreira, 2008). This could be because sentence production and comprehension utilize different mechanisms or different syntactic representations, but this seems unparsimonious since both the production and comprehension of sentences require building the same kinds of structures.

We propose that this inconsistency is due in part to the disparity in the methods used to assess “priming” in the case of production and comprehension. In language production a syntactic structure is “primed” when the speaker produces it again. However, it is less clear how a structure can be repeated during language comprehension. Comprehension studies typically use locally ambiguous sentences to test for priming effects: previous processing of a similar syntactic structure should facilitate reading in the temporarily ambiguous region. Unlike in language production, readers do not choose the final interpretation of the sentence; instead, the syntactic structure of the sentence is fixed and the effect of repeating the previous structure is measured indirectly.

We investigated syntactic priming in language comprehension more directly, using sentences containing ambiguously attached propositional phrases (PPs). Participants read sentences phrase-by-phrase on a computer screen, then answered a question, which was used to diagnose how they had parsed the sentence. The relevant sentences were primes (1), which included semantic content that disambiguated the PP attachment site, and targets with PP-attachment ambiguities (2).

- (1) The kids were all scared of the spider in the web with the fangs.
- (2) The FBI agent noticed the mirror on the wall with a crack.
What had a crack? (a) the wall (b) the mirror

Filler sentences with unrelated syntactic structures were included to disguise the purpose of the experiment. Reading times for each segment and answers to the questions were recorded. Mixed-effects regression models were used to evaluate the reliability of the results.

There were significant effects of prime type (high vs. low attachment) and trial number (p -values < 0.01) on the degree of syntactic priming. High attachment primes were more effective, although the initial baseline preference was for low attachment, replicating previous findings that dispreferred structures elicit stronger priming effects. Participants were faster to read the last segment of the sentence (underlined in (2)) when they chose the interpretation that corresponded to the structure of the prime sentence.

These results show that when syntactic priming in language comprehension is evaluated using globally ambiguous sentences, facilitation is observed just as in production studies. After being exposed to both structures over the course of the experiment, participants' sensitivity to the prime structure when parsing the ambiguous target sentence increased. This suggests that priming effects are largest in comprehension when both of the possible parses of the sentence are highly likely to occur.