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Exploring interactions between semantic and syntactic processes: The role of animacy in syntactic priming

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A B S T R A C T

The current study addressed the relation between syntactic and semantic processes during language production in 5- and 6-year-old children. A priming paradigm was used to examine children's production of passives in describing transitive scenes (target pictures) following exposure to the experimenter's sentences (primes). The key question was whether the tendency to repeat the syntactic form of the prime was affected by the animacy features in the prime and the target picture. In Experiment 1, children heard either passive or active primes with varied animacy configurations (e.g., animate patient/inanimate agent vs. inanimate patient/animate agent). The animacy features of the prime matched those of the target. Similar to prior studies, results showed a greater use of passives following passive, as opposed to active, primes. Critically, the difference between the two priming conditions varied as a function of animacy; it was larger when the prime and the target included an animate patient/inanimate agent than with the reversed animacy. In Experiment 2, the animacy configuration of the prime either matched or did not match that of the target. Results showed a greater likelihood of producing a passive when the target picture contained an animate patient versus an inanimate patient, and this effect was stronger when the prime had the same animacy features. The findings indicating that syntactic priming is moderated by animacy are discussed in the broader context of understanding the role of semantics in guiding the choice of syntactic structure.

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Introduction

When producing language, speakers must choose words to express an intended meaning, assign these words their syntactic roles, and assemble them within a particular sentence structure. The fundamental conceptual issue examined in the current study concerns the nature of the relation between semantic and syntactic processes involved in children's language production. We ask to what extent semantic properties, specifically animacy, modify the processes guiding the choice of syntactic form of a sentence. We address this question by leveraging the priming paradigm to test whether children's tendency to repeat the syntactic structure of the prime is affected by the animacy configuration in the prime and in the child's intended message.

Processes involved in language production

In an influential theoretical model of language production, Levelt (1989) provided a framework for exploring the processes underlying language production and the potential interplay between them. The model postulates distinct stages involved in preparation for articulating speech: conceptualization, in which speakers conceptualize a message, and formulation, in which conceptual representations undergo grammatical encoding. At the stage of message conceptualization, speakers nonlinguistically represent the aspects of meaning that are to be conveyed in a sentence. Such conceptual representations may include thematic roles (e.g., the agent or patient of an action) and the animacy of the entities involved in the event (Pickering & Ferreira, 2008). The preverbal information represented in the conceptual message must be mapped onto specific language devices, which occurs at the formulation stage. It is at this stage that speakers choose words that express their intended meanings, assign these words their respective syntactic roles, and combine them to form sentences. These processes comprise grammatical encoding, which precedes the final production stage where sounds and intonation are used to create phonological representations that are ultimately articulated by speakers.

Although this model provides a general outline of the processes involved in language production, the specifics concerning the structure of information at different stages and possible mechanisms of interrelations between stages remain unclear. One methodological tool that has been used to explore the nature of syntactic processing and its relation to semantic levels of processing is the structural priming technique (see Pickering & Ferreira, 2008, for a review). This experimental methodology involves exposing participants to sentences that have a predetermined structure (i.e., primes) and exploring whether any aspect of that structure is repeated in the participants' subsequent sentence production. The priming paradigm has been used to examine speakers' tendency to repeat both the syntactic form and semantic features of the prime. Thus, this paradigm can provide information relevant to the key conceptual issue addressed in the current study, namely the relation between semantic and syntactic processes involved in language production. To the extent to which the repetition of the syntactic form (i.e., syntactic priming effect) is independent of the semantic features of the stimuli, one could argue that the syntactic level of processing is encapsulated from semantic information (Pickering & Ferreira, 2008). On the other hand, if repetition of the syntactic form is sensitive to manipulations of semantic features, this would suggest an interaction between the levels of processing.

Using priming methodology to investigate processes involved in language production

Bock and colleagues used a priming procedure to explore the nature of syntactic processes, in particular, their lexical independence (Bock, 1986; Bock & Loebell, 1990). The results showed a clear syntactic priming effect: after exposure to a prime sentence with a particular syntactic structure (e.g., passive), speakers were more likely to produce their own sentence with the same structure (e.g., passive) rather than the alternate structure (e.g., active). Furthermore, because speakers' own sentences contained a different set of words than the prime, the findings were interpreted as showing that the