

Linear order and syntactic structure in sentence priming

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Introduction In this paper we report on a series of experiments investigating the interplay between surface and structural properties in sentence priming. Essentially all transformational theories of syntax allow for derivations with intermediate steps, i.e. changes in syntactic structure that are further modified by later changes. Since the later changes manipulate the intermediate structure, the surface form of a sentence may contain only hints of underlying levels. Prior research on this topic, particularly from Bock et al. (1992), has argued that structural priming is primarily sensitive to the surface position of syntactic elements. We investigate this question using data from both production and comprehension priming paradigms across combinations of three syntactic alternations in English: passives, questions, and ditransitives.

Methods Experiment 1 is a production study using a picture description task to assess whether passive questions prime passive declaratives. In critical pairs, participants had to answer a question about one picture in the prime and then describe a different picture in the target using a specified verb. Four different prime types were used, which crossed which argument was questioned (agent/patient) and whether the question was active or passive, which allowed us to dissociate information structural effects from morphosyntactic effects of passivisation. The dependent measure was rate of passive use in target description. Experiment 2 is a comprehension study using a self-paced reading task to investigate how passive ditransitives prime active ditransitives. The dependent measure in experiment 2 was reading time in the second chunk of the target sentence, where the variation in object order occurs. We predicted that actives would be facilitated by passive descriptions with the same argument order, assuming that argument order in the passive is derived from the same order in the underlying active.

	Experiment 1	Experiment 2
Primes	What did the squirrel eat? [Pat. Act.] What was eaten by the squirrel? [Pat. Pass.] What ate the acorn? [Agt. Act.] What was the acorn eaten by? [Agt. Pass.]	(She was) (given it) (on Tuesday) (It was) (given to her) (on Tuesday)
Targets	Picture of baseball breaking a window “break”	(They gave) (him it) (in January) (They gave) (it to him) (in January)

Table 1: Examples of Experimental Items: () indicate chunking for self-paced reading

Results We analysed the data using mixed effects regression. Experiment 1 showed that both passive primes ($p=0.002$) and patient primes ($p=0.024$) facilitated passive descriptions. These results indicate that a sentence’s linear order is primable separately from its syntactic structure, which suggests that the results from Bock et al. (1992) need not rule out possible priming of derivational history. For experiment 2, we found that passive sentences where the verb directly preceded the direct object (“She was given it”) primed active sentences where the verb directly preceded the direct object (“They gave it to him”), rather than sentences that share the same hierarchical relationship of recipient-over-theme (“They gave him it”). This suggests a prominent role for surface position in self-paced reading.

Conclusions Our current results show that sentence level priming is sensitive to both structural factors as well as local linear relationships. We are currently running experiments in which we modify the self-paced reading paradigm to reduce the linear effect and tap into structural properties.

References: • Bock, Kathryn, Helga Loebell, and Randal Morey. 1992. From conceptual roles to structural relations: bridging the syntactic cleft. *Psychological Review* 99:150–171.