

## Interpreting implausible sentences: The role of phonological similarity

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People sometimes believe that an implausible sentence (*The father handed the gun the son*) results from mis-perception/production (e.g., from the omission of *to*) and would thus edit the sentence by inserting *to* (or deleting *to* in the case of *The father handed the son to the gun*) to arrive at a plausible interpretation (Gibson et al., 2013). Both the insertion and deletion edits require a change to the syntax of the original sentence. However, a third edit is possible: people can assume that *the son* and *the gun* were accidentally swapped in perception/production and can thus arrive at a plausible interpretation by exchanging the positions of the two nouns without changing the syntax.

We examined the use of the exchange edit by manipulating the phonological similarity of nouns. Phonologically similar words, compared to dissimilar ones, are more likely to be exchanged in their position in both speech production (Dell & Reich, 1981) and in memory retrieval (Baddeley, 1966). Thus, at hearing *The father handed the gun the son*, people may believe that *son* and *gun* were accidentally swapped, either due to speech error by a speaker or due to mis-perception by themselves.

The experiment (38 participants, 40 target items, 60 fillers) adopted a design of 2 (plausibility: plausible vs. implausible) x 2 (Structure: double-object [DO] vs. prepositional object [PO] dative) x 2 (Similarity: dissimilar vs similar theme and recipient nouns) (see Table 1). The theme and recipient nouns differed in the onset in the similar condition but had no phonological overlap in the dissimilar condition (e.g., *son-gun* and *son-bill*). The theme nouns (*gun* and *bill*) were the same in syllable number and comparable in frequency. A pretest revealed no difference in plausibility between plausible sentences with similar nouns and those with dissimilar nouns. In the experiment, participants listened to a sentence and then answered a yes/no comprehension question which helped to determine whether participants literally interpreted or re-interpreted a sentence.

Logit mixed-effect results showed that, consistent with Gibson et al. (2013), DO sentences were more likely to be re-interpreted than PO sentences ( $\beta = 1.52$ ,  $SE = 0.32$ ,  $z = 4.76$ ,  $p < .001$ ). More critically, sentences with similar nouns were re-interpreted more often than those with dissimilar nouns ( $\beta = -1.33$ ,  $SE = 0.54$ ,  $z = -2.48$ ,  $p = .013$ ). There is also a marginally significant interaction between structure and similarity ( $\beta = 1.89$ ,  $SE = 1.05$ ,  $z = 1.79$ ,  $p = .073$ ). Separate analyse showed that the phonological similarity effect emerged in PO sentences ( $\beta = 0.82$ ,  $SE = 0.42$ ,  $z = -1.95$ ,  $p = .051$ ) but not in DO sentences ( $\beta = 0.15$ ,  $SE = 0.80$ ,  $z = 0.19$ ,  $p = .85$ ).

If people only apply insertion or deletion on the preposition *to* in the comprehension of implausible dative sentences, we should not expect sentences with similar nouns to be more often re-interpreted than those with dissimilar nouns. The results thus suggest an additional edit on the nouns themselves. We believe that people sometimes arrive at a plausible re-interpretation of an implausible sentence with similar theme and recipient nouns by exchanging positions of the nouns. We are in the process of doing a structural priming experiment to further test this exchange account.

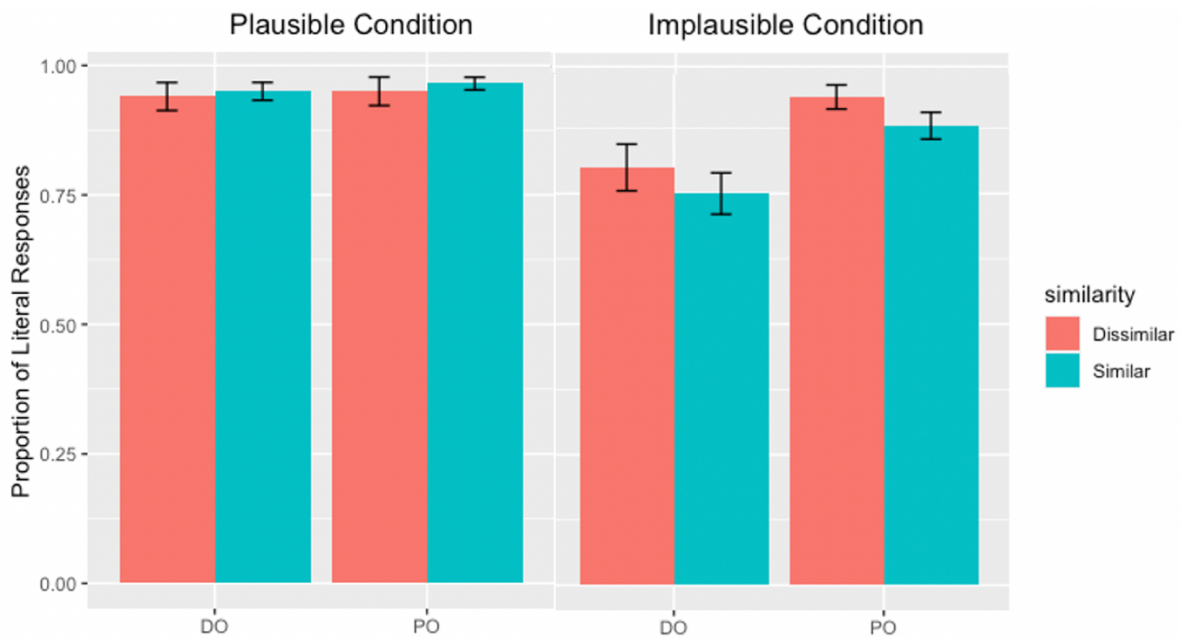
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**Table 1: Example item**

Plausibility	Similarity	Structure	Sentence
plausible	similar	DO	The father handed the son the gun.
implausible	similar	DO	The father handed the gun the son.
plausible	dissimilar	DO	The father handed the son the bill.
implausible	dissimilar	DO	The father handed the bill the son.
plausible	similar	PO	The father handed the gun to the son.
implausible	similar	PO	The father handed the son to the gun.
plausible	dissimilar	PO	The father handed the bill to the son.
implausible	dissimilar	PO	The father handed the son to the bill.



**Figure 1. Proportion of literal interpretations across conditions. Error bars represent SEs.**