

## Processing the Ordering of Definite and Indefinite Noun Phrases in Ditransitives

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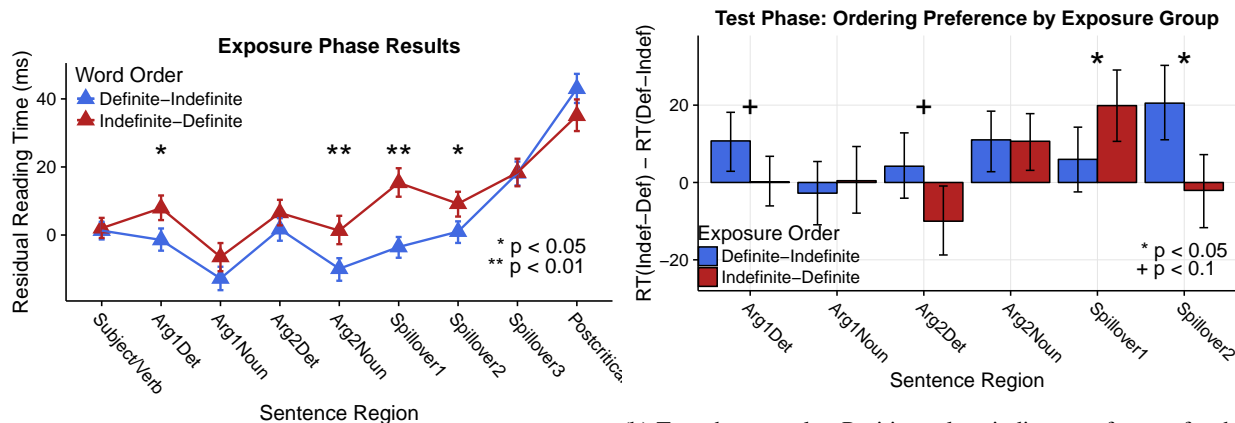
Across many different structures and languages, there is a preference for definite noun phrases to be ordered before indefinite noun phrases. One such example is that of ditransitives: when one argument of the verb is definite and the other is indefinite, the definite argument tends to be spoken (or written) first (Bresnan et al., 2007). Despite the large number of corpus and production studies on this topic, very few studies have investigated the online processing of definiteness ordering in ditransitives. In this study, we ask two questions. First, we test whether in comprehension there is a preference for definite arguments to appear before indefinite arguments in ditransitives. Secondly, we test whether comprehenders are able to adapt their processing to a new ordering of definiteness. That is, does repeated exposure to the indefinite-before-definite order reduce the preference for the definite-before-indefinite order?

**Methods.** We recruited 178 participants from Mechanical Turk for a word-by-word self-paced reading experiment. In the first phase of the experiment, exposure, one group of participants read 24 sentences in the definite-indefinite order, while another group read the same number of sentences in the indefinite-definite order. Afterwards, in the test phase, participants read 12 sentences, half in each order. All critical sentences were in the double object construction of the ditransitive. Below are example sentences showing each ordering:

- (1) Definite-Indefinite Order: The woman sent **the**<sub>Arg1Det</sub> **author**<sub>Arg1Noun</sub> **a**<sub>Arg2Det</sub> **letter**<sub>Arg2Noun</sub> about<sub>Spillover1</sub> how<sub>Spillover2</sub> much she enjoyed his latest book.
- (2) Indefinite-Definite Order: The woman sent **an**<sub>Arg1Det</sub> **author**<sub>Arg1Noun</sub> **the**<sub>Arg2Det</sub> **letter**<sub>Arg2Noun</sub> about<sub>Spillover1</sub> how<sub>Spillover2</sub> much she enjoyed his latest book.

**Results.** In the exposure phase, we found that participants read the definite-indefinite order faster than the indefinite-definite order at the determiner of Argument 1, the noun of Argument 2, and the first two spillover regions of the sentence, even after controlling for between-group baseline reading time differences (see Figure 1a). In the test phase, we found that participants trained in the indefinite-definite order had a reduced reading time advantage for the definite-indefinite order as compared to the group of participants trained in the definite-indefinite order. This was significant at the second spillover region, and marginal at the determiners of Argument 1 and Argument 2 (see Figure 1b).

**Discussion.** We found that there is a reading time preference for the definite-indefinite order over the indefinite-definite order in comprehension, but that this preference can be reduced with repeated exposure to the indefinite-definite order. These results suggest that comprehenders track the statistics of definiteness ordering in their environment and are able to rapidly adapt to an environment with different definiteness ordering statistics.



(a) Exposure phase results.

(b) Test phase results. Positive values indicate preference for the definite-indefinite order, and negative values indicate preference for the indefinite-definite order.

Bresnan, J., Cueni, A., Nikitina, T., Baayen, R. H., et al. (2007). Predicting the dative alternation. *Cognitive foundations of interpretation*, 69–94.