

Order implicatures are faster (but less accurate) than explicit meaning

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Speakers have many options to communicate the order of events in natural language. For example, a speaker could explicitly communicate the order of events with words such as *after* or *before*, e.g., “he took off his clothes before showering”. They could also *imply* a given order using *and*, e.g., “he took off his clothes and showered”. The difference is that the order meaning is not obligatory in the *and* case. For example, “John smiled and waved” can mean that John smiled and waved at the same time (see Bott, Frisson & Murphy, 2009). Of interest for psycholinguists is exactly *how* listeners go about deriving the order implication: does the order of mention of the events in the sentence determine a fast and automatic iconic representation of the events or do listeners use conversational maxims to derive a slower, pragmatic inference (e.g., Grice, 1975). We use a multiple-response speed-accuracy trade-off method (e.g., McElree, 1993) to compare speed of processing for implicit and explicit temporal order sentences.

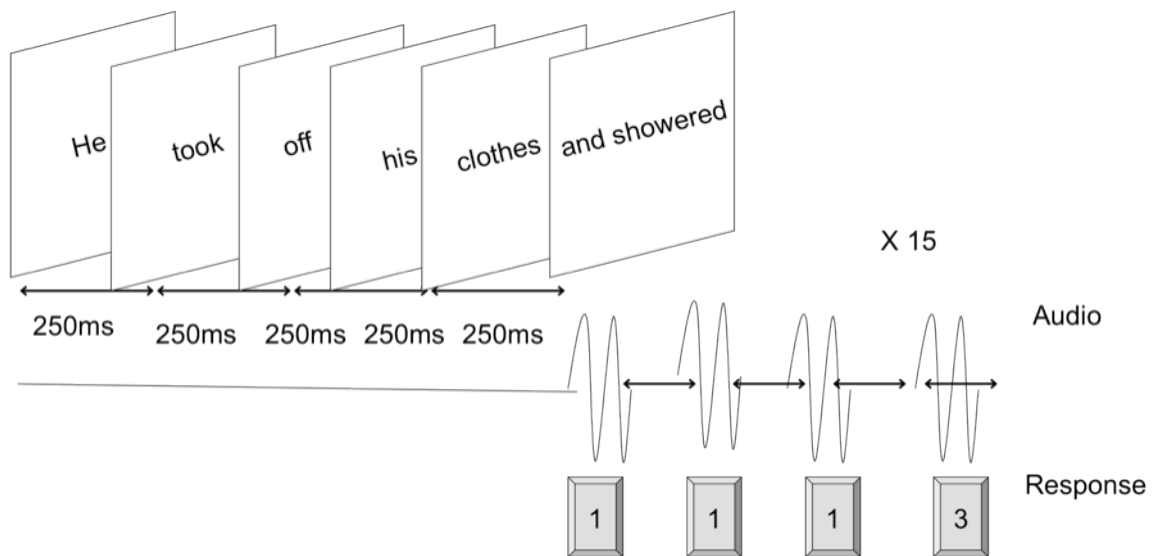
Participants made sensibility judgments about four types of sentences: 1) John took off his clothes and showered (implicit sense) 2) John took off his clothes before showering (explicit sense) 3) John put on his clothes and showered (implicit nonsense) and 4) John put on his clothes before showering (explicit nonsense). Participants’ responses were cued by a series of 15 beeps at 300ms intervals starting at the onset of the final word (see Diagram 1). There were 181 quadlets of items (4 versions of each of the 181 items) divided across four lists. Participants’ response times were placed into 300ms bins (corresponding to each beep) and *d-prime* values were calculated for implicit (*and*) and explicit (*before*) conditions. Accuracy as a function of time was compared across conditions via individual participant and averaged data model fitting. The results are shown in Graph 1.

The results show two important findings. First, the implicit sentences have lower overall accuracy (lower asymptotic accuracy) than explicit sentences. This suggests that in the implicit condition, participants were able to derive more flexible interpretations to the nonsense items than in the explicit condition. Second, implicit sentences are faster to be derived than explicit sentences, i.e. there is an earlier intercept for the implicit condition, consistent with an iconic account of temporal order implicatures. This is the first demonstration of how implications can be faster to interpret than their explicit equivalents. Further experiments are planned to investigate what causes the speed differences across conditions. We discuss the results in relation to scalar implicatures, which are found to be slow to derive with respect to explicit controls (Bott, Bailey, & Grodner, submitted; Huang & Snedeker, 2009).

References

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Diagram 1 – Multiple Response Speed-Accuracy Tradeoff Method



Graph 1 – Model fits with average parameter values for Explicit vs. Implicit conditions.

