

## Viewing the Metaphor Interference Effect in context

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In literal truth-value judgement tasks, participants take longer to judge metaphors as *literally false* than scrambled metaphors. This is known as the *metaphor interference effect* (MIE) [1]. Two models of metaphor derivation provide competing accounts of the MIE. The attributive categorization model argues that the MIE results from automatic metaphorical meanings, whose truth-value conflicts with the literal [1,2]. The structure-mapping model proposes that the interference is caused by an initial alignment to find the basis of an analogy that underpins the figurative meaning (not interference from figurative meaning itself) [3,4]. Here we assume an automatic attribution of figurative meaning but propose that an important factor contributing to delay in task response is uncertainty over which figurative meaning a sentence has, due to lack of context in typical MIE-task stimuli. (1.a-b) illustrates how metaphors are typically ambiguous without context. It is well-established that unresolved ambiguity can tap resources [5,6] and this could delay selection of the literal. Thus, we predict that a constraining context will eliminate or decrease the delay. [1,2] predicts, if anything, context will increase delay due to greater salience of figurative meaning. [3,4]'s initial process is context independent [7] and so does not predict difference with context. Results of Task 1 (literal truth-value judgement task) confirm our prediction that the context eliminated the MIE. Results of task 2 (comprehensibility decision task) show that, without context, metaphorical meaning derivation takes significantly longer than literal verification in Task 1; with context, figurative meanings are available at the same time as verification RTs. We conclude that the MIE results from uncertainty over figurative meaning computation, leaving fewer resources for the controlled processing of literal truth verification.

**In literal truth-value judgement task**, participants (N=48) were instructed to decide, as quickly and accurately as possible, whether the target sentence was literally true or false in either a no-context or a context condition. The context sentence was formulated so that target sentence was an elaboration and thus it strongly constrained figurative meaning.

*Results:* We found a Sentence form \* Context interaction ( $F=4.15$ ,  $p=.048$ ). A large MIE was found in the no-context condition ( $t=3.860$ ,  $p<.001$ ); no MIE was found in the context condition ( $t=0.874$ ,  $p=.3869$ ) – see **Fig. 1**.

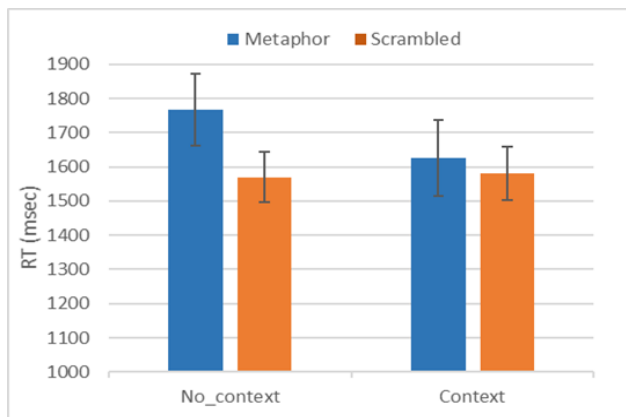
**In comprehensibility decision task:** 48 participants made comprehensibility decisions to the target sentences of metaphors, scrambled sentences and literal fillers in either a no-context or a context condition; occasionally, they were asked to paraphrase the target sentence they had read. Unsurprisingly, decisions took longer with no context. Analysis of the data for metaphors from the two tasks showed RTs for comprehensibility decisions were later than verification RTs only in no-Context condition (replicating [3]) – see **Fig. 2**.

**Discussion:** The effect of strong constraining context on the MIE is surprising for different theoretical accounts of the effect ([1,3]). Our results support the marriage of an attributive model with current models of language processing under uncertainty.

1. He is a cactus.
  - a. Mary's boyfriend is an awkward character and often says unkind things. He is a cactus.
  - b. Mary's boyfriend loves spending the day in the desert, in the hot sun. He is a cactus.

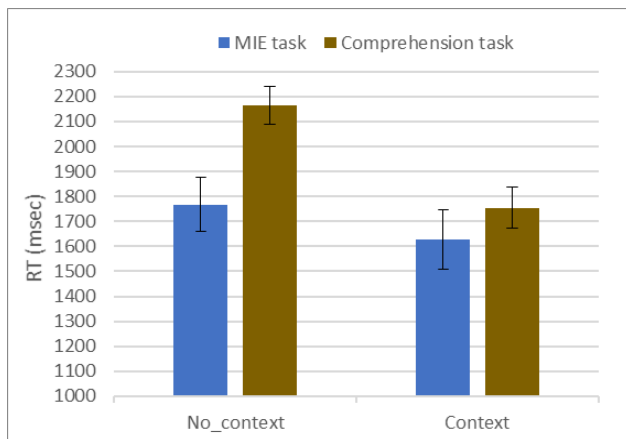
CONDITIONS	SAMPLE ITEMS	
	CONTEXT	TARGET
CONTEXT	Some of David's friends have a hearty appetite.	Some people are elephants. (metaphor)
	Some of David's friends have a hearty appetite.	Some degrees are elephants. (scrambled)
NO-CONTEXT	/	Some people are elephants. (metaphor)
	/	Some degrees are elephants. (scrambled)

**Table 1:** Metaphor or scrambled counterpart followed a context sentence or not in the experiment.



**Figure 1**

Mean RT (and standard errors of the mean) of *literally false* responses to metaphors and scrambled sentences in the two conditions (by participants)



**Figure 2**

Mean RT (and standard errors of the mean) of correct responses to metaphors in the two conditions of the MIE task and the comprehension task (by participants)

**References:** [1] Glucksberg, Gildea & Bookin (1982). *Journal of Verbal Learning and Verbal Behavior* 21, 85-98. [2] Gildea & Glucksberg (1983). *Journal of Verbal Learning and Verbal Behavior* 22, 577-590. [3] Wolff & Gentner (2000). *Journal of Experimental Psychology: Learning, Memory, and Cognition* 26, 529-541. [4] Wolff & Gentner (2011). *Cognitive Science* 35, 1456-1448. [5] Duffy, Morris & Rayner (1988). *Journal of Memory and Language* 27, 429-446. [6] Griffiths, Steyvers & Tenenbaum (2007). *Psychological Review* 114, 211-244. [7] Gentner (1989). In S. Vosniadou & A. Ortony (Eds.), *Similarity and analogical reasoning* (pp. 199-241).