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 counterparts (control sentences). 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, rather as in a Stroop task, 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 Exp.1 confirm our prediction but we still find an MIE with context. Exp 2 explores the timecourse of participants deriving metaphorical meaning(s) and shows that, with context, figurative meanings are available at the same time as verification RTs in Exp.1. We conclude that the MIE can result from uncertainty over figurative meaning computation, or stroop-like interference where context strongly constrains.

Experiment 1: We follow the general design of [1] except we add a Context condition. 24 metaphors and their scrambled counterparts plus context sentences were employed in a 2*2 between groups design. Participants (N=48) were instructed to judge the literal truth-value of target sentences in either a no-context or a context condition (see Table 1). The context sentence was formulated so that target sentence was an elaboration and thus it strongly constrained figurative meaning. Literal fillers counterbalance response biases. *Results*: We found main effects of form and context and an MIE in both conditions, although RTs for metaphors in Context are sig. lower than no-Context (see Fig. 1).

Experiment 2: 48 participants made comprehensibility decisions (*comprehensible* or *incomprehensible*) to the same set of target sentences in either the no-context or the 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 from the four groups across Exps. 1&2 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	The man who lives next door is a grubby, shifty person.	**Metaphor**: Some men are cockroaches.
	The man who lives next door is a grubby, shifty person.	**Scrambled counterpart**: Some men are duvets.
NO-CONTEXT	/	**Metaphor**: Some men are cockroaches.
	/	**Scrambled counterpart**: Some men are duvets.

Table 1: Metaphor or scrambled counterpart followed a context sentence or not. Scrambled forms were constructed by paring the topic ('some men') with the vehicle of another of the 24 metaphors to yield a sentence that is low in sensicality.

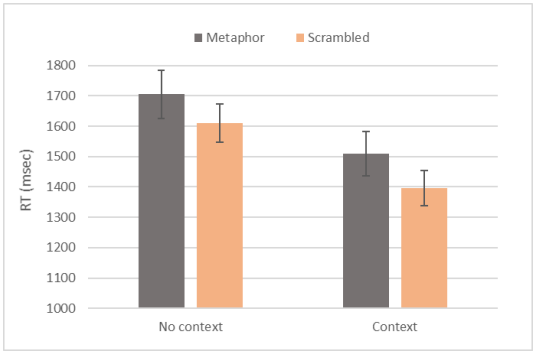

Figure 1

Mean RT (and standard errors of the means) to make *literally-false* decisions to metaphors and their scrambled counterparts in the two conditions.

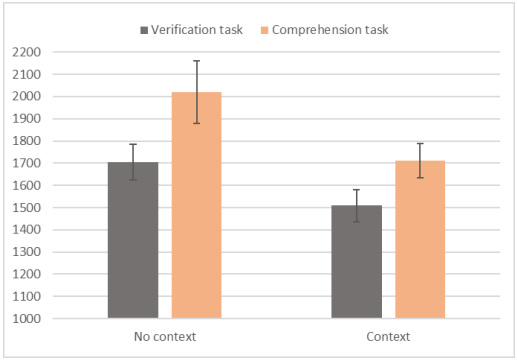

Figure 2

Mean RT (and standard errors of the means) for the sentence-verification task (metaphors only) and the metaphor comprehension task in the two conditions.

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).