Do speaker-specific cues influence ambiguous word interpretation?

Cat Davies[1], Vincent Porretta[2], Kremena Koleva[1], Ekaterini Klepousniotou[1]

[1] University of Leeds, UK; [2] University of Alberta, Canada

Speaker identity has been shown to be an influential factor in language processing across multiple linguistic domains, e.g. phonetics, syntax, reference, and pragmatics. Addressees use information from speakers' previous discourse to make predictions about incoming linguistic material and to restrict the choice of potential interpretations. For example, addressees disambiguate words during the earliest moments of processing based on whether a particular speaker had previously produced the same word (Creel et al., 2008). Addressees also disambiguate syntactic structures based on previously modelled attachment preferences by particular speakers (Kamide, 2012). In pragmatic processing, partner-specific stored information may be especially helpful in disambiguating intended meaning. For example, contrastive inferences are suspended if a particular speaker has been habitually over-informative (Grodner & Sedivy, 2011), and addressees adapt to speaker-specific biases in the intended meaning of scalar quantifiers (Yildirim et al., 2016).

Our study used polysemous words with metaphorical extensions, e.g. *head; chair; fork,* which can be interpreted to refer to a dominant, literal meaning, as well as to a lower-frequency, metaphorical meaning, to investigate the extent to which speaker-specific cues influence semantic interpretation.

Using an exposure-test design, speaker identity was manipulated by training participants to associate a specific speaker with a highly literal or a highly metaphorical style. At test, participants responded to video instructions from each speaker to *'click on the X'* while their eye movements were tracked using the visual world paradigm. We hypothesised that participants would ultimately resolve reference to the literal target (LT, e.g., dinner fork) rather than the metaphorical target (MT, e.g., fork in the road) in both speaker-style conditions due to its meaning dominance. However, if addressees use speaker-specific

Figure 1. Example test item. Instruction: *click on the fork.*

information to disambiguate referring expressions, we predicted that participants would experience interference from the MT in the metaphorical speaker condition, indexed in that condition by i) longer reaction times for resolution to the LT in the metaphorical style condition; and ii) a lower proportion of looks to the LT while processing the ambiguous noun.
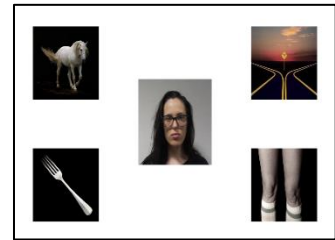
As expected, across speaker conditions, 89% of referring expressions were resolved to the LT and 10% to the MT (the remaining 1% were unresolved before timing out). Contrary to our prediction, there was no effect of speaker style on reaction times. Given the dominance of LT responses, we examined gaze data from noun onset to trial end on trials resolving to the LT. GLMER was used to analyse LT preference (i.e., looks to the LT vs. looks to the MT) as a function of speaker style. As Figure 2 shows, a significant effect was found in two critical time windows. In the early window (400-850ms), participants' preference for the LT was significantly reduced in response to the metaphorical speaker (estimate = -1.69, $SE = 0.64$, $p < .01$), as hypothesised. Conversely, in the late window (850-1300ms), participants' preference for the LT was significantly greater in response to the metaphorical speaker (estimate = 1.62, $SE = 0.57$, $p < .01$). This suggests early anticipation and interference of the MT in response to the metaphorical speaker. The later preference for the LT in this condition is likely due to participants double-checking the initial

interpretation. These patterns reflect listeners' assumptions that the metaphorical speaker may have intended the expressions to have a non-literal meaning.
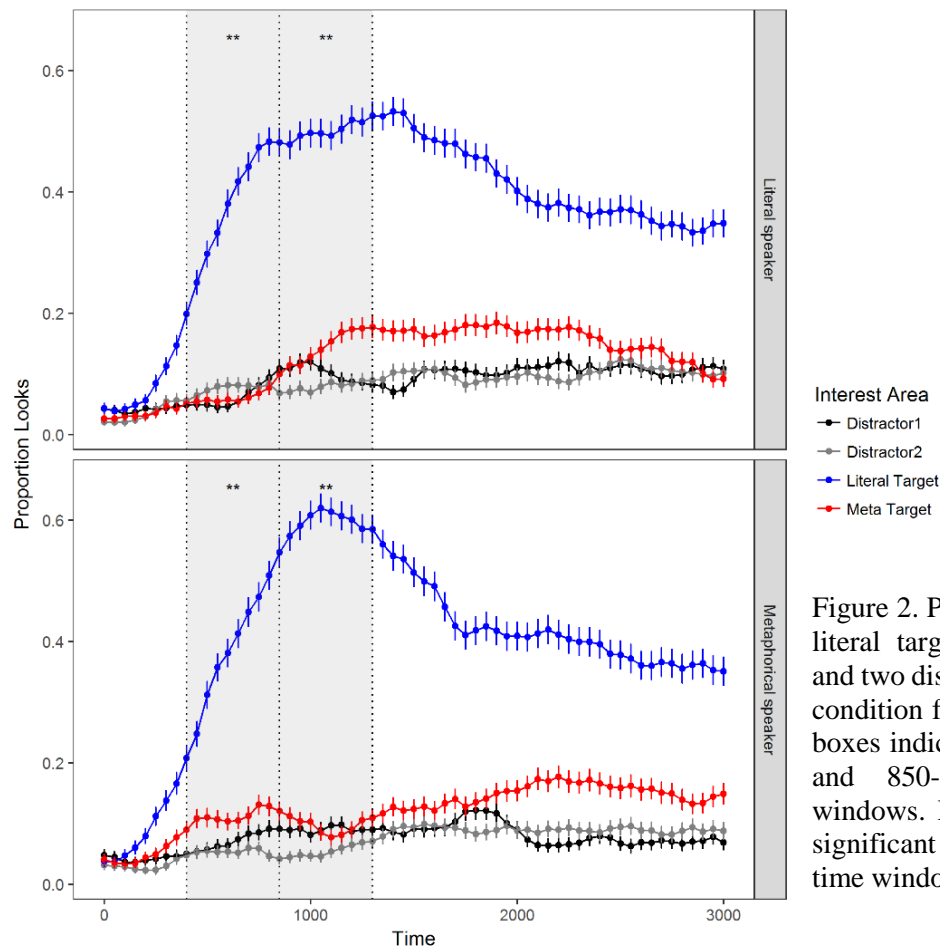

Figure 2. Proportion of looks to the literal target, metaphorical target, and two distractors by speaker-style condition from noun onset. Shaded boxes indicate 400-850ms ('early') and 850-1300ms ('late') time windows. Literal target preference significant by speaker style in both time windows ($p < .01$).

Our results support accounts proposing that semantic comprehension involves rapid integration of multiple cues including those of a social nature (Rodd, 2017). We provide evidence that speaker style is a contextual determinant in semantic disambiguation using polysemous words. Our findings extend the literature on partner-specific effects to the domain of semantic processing.

References

Creel. S.C., Aslin, R.N. & Tanenhaus, M.K. (2008). Heeding the voice of experience: The role of talker variation in lexical access. *Cognition*, 106, 633-664.

Grodner, D. & Sedivy, J. (2011). The effects of speaker-specific information on pragmatic inferences. In N. Pearlmutter & E. Gibson (eds). *The Processing and Acquisition of Reference.* MIT Press: Cambridge, MA.

Kamide, Y. (2012) Learning individual talkers' structural preferences. *Cognition,* 124, 66-71.

Rodd, J. (2017). Resolving ambiguities in spoken language: Evidence from skilled adult comprehenders. Presentation at *Multi-disciplinary approaches to understanding social communication development and disorder* (University College London, 13/02/2017).

Yildirim, I., Degen, J., Tanenhaus, M.K., and Jaeger, T.F. (2016). Talker-specificity and adaptation in quantifier interpretation. *Journal of Memory and Language*. 87, 128-143.