Semantic Sense Affects Source Monitoring

Arlo Clark-Foos J. Thadeus Meeks Justin B. Knight Gene A. Brewer Richard L. Marsh

The University of Georgia, Athens, GA

Introduction

Most memory traces have contextual or source details associated with them that indicate characteristics that occurred at memory formation. Obviously, some memories will have greater clarity than others, and our goal was to understand how such clarity might affect the binding of such contextual details into memory. Specifically, we sought to understand whether semantically confusing information would affect the learning of contextual information as compared with sensical information. Consequently, we presented ambiguous figures with a caption that either did or did not make the figure meaningful. Our procedural innovation was to present these captions in either a male or female voice, and later test memory for the gender of the speaker for each caption (in Experiment 1). Our investigation began with two competing hypotheses. One hypothesis was that semantic confusion would lead to a drain on attentional resources and consequently reduce people's ability to encode contextual information. This position is supported by divided attention and aging effects on context memory. An alternative hypothesis was that semantic consistency would facilitate the binding of contextual information into a richer and more coherent memory trace that would later facilitate source-memory judgments.

Experiment 1: Procedure

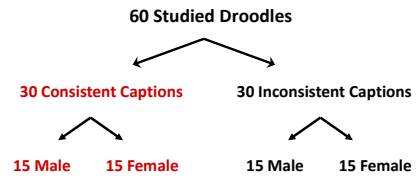
Study Phase

- See diagram labeled Materials
- 30 droodles had sensical captions; 30 had nonsensical captions
- Within each class, 1/2 spoken by a ♂ and 1/2 by a ♀
- Sensicality manipulated within participants
- Separate control condition heard only captions (no droodle)
- N = 32

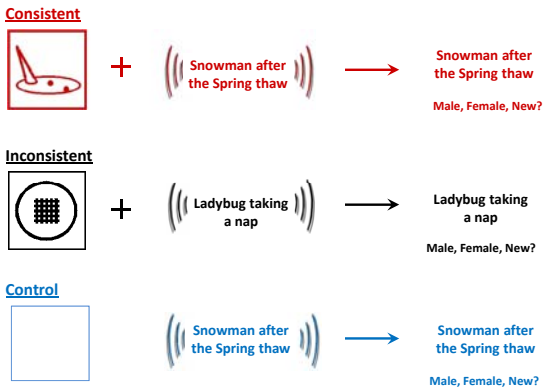
Test Phase

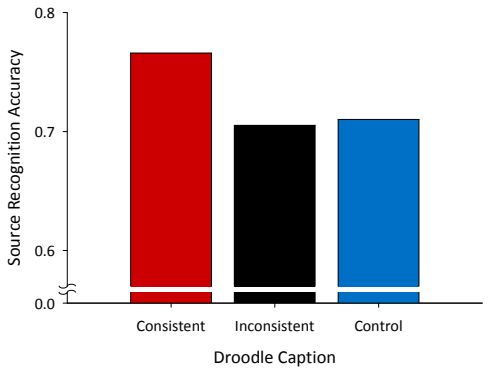
- Tested with printed captions
- 30 each: Male items, Female items, and New items
- See diagram labeled Study and Test Procedure

Materials



Study & Test Procedure



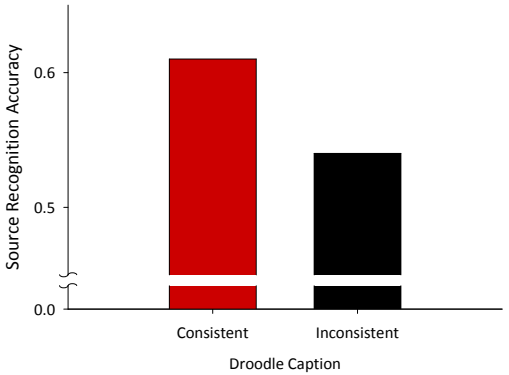


Experiment 1: Results

•The data are displayed in the figure with performance calculated as the average correct gender specification with each task and condition. The left two bars indicate that context memory for the gender of the speaker was better for semantically sensical information as compared with nonsensical information. The rightmost bar depicts gender memory when no picture was presented at learning (i.e., the control). Given that the control and the nonsensical conditions were statistically indistinguishable, the results favor a binding account of richer representations facilitating source monitoring; and they do not favor an account in which nonsensicality reduces attention toward binding of contextual information in memory. Theoretically, this experiment suggests that at encoding, semantic sense affords increased learning of information that is associated with an event or experience.

Experiment 2: Rationale

In Experiment 1 we tested only a perceptual attribute; thus, we would be on firmer ground if we found similar results with a different contextual attribute. Spatio-temporal characteristics are also critical to validating the circumstances in which one might have encountered information earlier. In this next experiment, we sought to understand if the semantic sensicality effect would replicate when we queried people on temporal information. We operationalized this by asking people in which third of a list a caption occurred. The procedural details were identical during study as reported for Experiment 1, but we did not test a control condition in this experiment.



Experiment 2: Results

Performance was calculated as the average correct specification of list-third position when the caption either did or did not make sense during learning. As can be seen, sensical captions that disambiguated the meaning of the figure resulted in better source memory as compared with a caption that was nonsensical with regard to the droodle. This outcome wholly replicated the results from Experiment 1, and therefore, lends credence to the notion that semantic sensicality increases or aids binding of contextual attributes into memory. The effects that we found here appear to be generally characteristic of different source attributes, but need to be extended to other attributes specified in the source-monitoring framework.

Conclusions

Our preferred explanation is that semantic sensicality increases the richness and elaborative detail of a memory trace during encoding. Specifically, if one believes that a memory trace is a bundle of various features, semantic sensicality aids in binding these features together during learning. Of course, there is an alternative hypothesis that the outcomes reported here are a testing effect. By this account, a caption presented with an inconsistent droodle is unable to evoke a pictorial representation, and thus, serves as a poor retrieval cue for either gender or temporal information. This retrieval account is plausible, but it belies the fact that the associations must be present and learned at encoding. Consequently, we prefer a binding account rather than on focused on test cues.