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The Effect of Cue Naming in Probabilistic Category Learning

Fotis A. Fotiadis (fotisfotiadis@gmail.com)
Department of Philosophy & History of Science, University of Athens, Ano Ilissia Campus
GR-157 71, Athens, GREECE

Athanassios Protopapas (aprotopapas@phs.uoa.gr)
Department of Philosophy & History of Science, University of Athens, Ano Ilissia Campus
GR-157 71, Athens, GREECE

Argiro Vatakis (argiro.vatakis@gmail.com)
Cognitive Systems Research Institute, Fragkokklisias 43
GR-151 25, Athens, GREECE

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Introduction

Memory is not considered to be unitary, as distinct systems are thought to contribute to knowledge acquisition. A major distinction is drawn between declarative and procedural memory (Squire, 1992). The Weather Prediction Task (WPT; Knowlton, Squire & Gluck, 1994) is thought to be mediated by both systems, at different periods in training.

In the present study we hypothesized that an operating characteristic of declarative knowledge is its availability to be verbally expressed (Squire, 1992). We thus manipulated the availability of WPT cue names in two experiments employing auditory (Exp. 1) and visual (Exp. 2) cues. We assumed that participants categorizing computer-generated tones or irregular quadrilaterals (non-nameable conditions) would be unable to develop, or rely on, declarative, verbalizable strategies, at least early in the task, in contrast to participants categorizing recognizable animal sounds or known geometric shapes (nameable conditions). As predicted, performance in the non-nameable conditions of the WPT was at chance levels for a longer period initially in training, compared to the nameable conditions, and lagged behind throughout training.

Methods

20 young healthy participants were administered each version of the WPT. All versions followed the trial order and cue contingencies of Gluck, Shohamy, and Myers (2002). Data for 20 blocks of 10 trials are analyzed below.

Results

In both experiments, the effect of block was significant in both the nameable and non-nameable condition, indicating gradual learning. For both visual and auditory cues, performance was not significantly different from chance (50% optimal responses) for a longer initial period in the non-nameable condition. A 2 (modality) × 2 (nameability) × 20 (block) ANOVA on pooled data from both experiments revealed strong main effects of block and nameability, no main effect of modality, and no interactions, consistent with cue name availability affecting learning equally in both modalities.

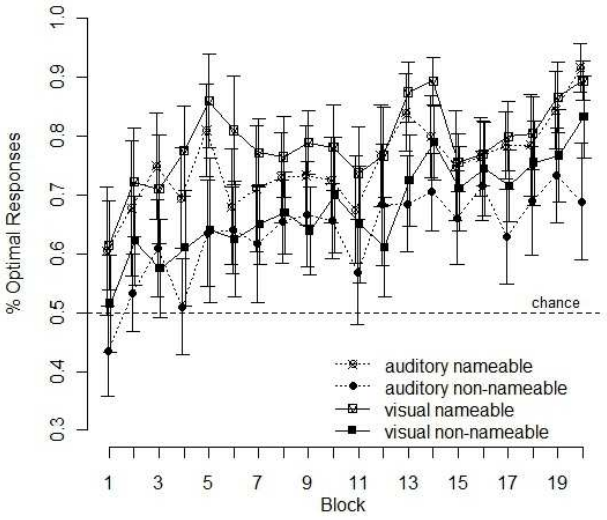

Figure 1: WPT performance, analyzed in blocks of 10 trials, in Exp. 1 and 2. Error bars are 95% CI.

Discussion

The present study provides an experimental manipulation hindering the contribution of the declarative system early in the WPT. Further research is required to examine a possible effect of the cues' perceptual features on WPT performance.

References

Knowlton, B. J., Squire, L. R., & Gluck, M. A. (1994). Probabilistic classification learning in amnesia. *Learning & Memory*, *1*, 106-120.

Squire, L. R. (1992). Memory and the hippocampus: A synthesis from findings with rats, monkeys, and humans. *Psychological Review*, *99*, 195-231.

Gluck M. A., Shohamy D., & Myers C.. (2002). How do people solve the "weather prediction" task? Individual variability in strategies for probabilistic category learning. *Learning & Memory*, *9*, 408-418.