Title: Stimulus Modality Influences Probabilistic Category Learning in a Weather Prediction Task

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Abstract: 1.58

In probabilistic category learning, people are able to acquire the cue-outcome relations and make accurate predictions. However, it remains unclear whether stimulus modality influences probabilistic category learning and whether the learned knowledge is necessarily conscious. To address this issue, the current study adopted visual-visual, audio-audio and visual-audio stimuli in a weather prediction task, in which the conscious status of the acquired knowledge was measured by post-decision wagering and inclusion and exclusion tests. With predictive power for each dimension of all stimuli being .50, participants couldn’t predict the weather based on any single dimension. In the training phase, subjects were asked to predict the weather through a visual or auditory feedback of “correct” or “incorrect”. In the test phase, participants were asked to predict the weather without the feedback and to give a wager for each of their predictions.

In Experiment 1, participants performed significantly above chance for all three conditions in the test phase. Specifically, the optimal response rates in the visual condition were significantly higher than those in audio and crossmodal conditions, while there were no significant differences between the latter two conditions, indicating a visual learning advantage. Moreover, the conscious measures consistently indicated that the acquired knowledge was mainly unconscious. Using the complicated visual stimuli in Experiment 2 and changing the visual feedback to an acoustic one in Experiment 3 did not influence the visual learning advantage effect. Neither did extending the training phase in Experiment 4 alter the advantage effect, but it made people be aware of the cue-outcome relations. The results revealed that probabilistic category learning could occur without consciousness in both single-modal and cross-modal conditions and interestingly, there was a visual learning advantage effect in combine information from two dimension to make the prediction in probabilistic category learning.