Does surprise modulate the beneficial effect of choice on memory?

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Résumé

When people are offered the opportunity to choose, their memory is enhanced. For example, people would be able to remember the map of a new city better if they explore by themselves instead of following Google Maps. However, the cognitive mechanisms of the beneficial effect of choice on learning have rarely been investigated. From a predictive coding perspective, choices facilitate learning because the act of choosing modulates the prediction of upcoming information. When the outcome of a choice mismatches with the prediction, it creates a surprise. This surprise, in turn, may affect how well the chosen information is remembered. To investigate this, we conducted a memory experiment, independently manipulating choice and surprise. First, in a training phase, participants learned associations between colors and object categories by viewing exemplar images cued by colored circles. For instance, a red circle represents the object category "mammals". Thereafter, participants completed a memory encoding task in which they were instructed to remember as many images of objects as possible. On each trial, before the object images were shown, participants either chose (choice condition) or were assigned a category (no-choice condition) of objects to view. Categories of objects were cued by the presence of the associated colored circle belonging to each category. In half of the choice and no-choice trials, the object shown would match the selected color (no-surprise condition), while in the other half of trials, the color and the object shown would be incongruent with the learned association (surprise condition). The memory accuracy was tested by a recognition task after the memory encoding phase. The preliminary results will be presented as a poster at the Foraging Conference. We hypothesize that choice improves memory for both surprise and no-surprise conditions, but the choice effect should be larger for surprising as compared with unsurprising objects. Additionally, category preferences will be analyzed to explore their influence on memory encoding in no-choice conditions. These findings will provide insights into the cognitive mechanism of choice effect in memory encoding.

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