Effects of Motivation to Explore on Memory in Young Adults

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Introduction

- Epistemic curiosity is the desire to acquire new knowledge (Berlyne, 1954, 1978) in order to stimulate gratifying feelings of interest or relieve negative feelings of feeling deprived of knowledge (Litman, 2005).
- Individuals are more likely to remember information if it was learned under states of high curiosity (Gruber et al., 2014). For example, Kang et al. (2009) presented participants with trivia questions and asked them to rate their curiosity for the answer. They found that answers were better remembered on a later test if curiosity was high relative to low during learning.
- To date, most studies have operationalized curiosity in terms of self-reported ratings (Gruber et al., 2014; Kang et al., 2009) or willingness to give up resources such as time or money to access information that one is curious to learn (Kang et al., 2009; Marvin & Shohamy, 2016)
- One study found that curiosity was a positive predictor of exploration: Participants were more likely to indicate that they wanted to know more about (i.e., explore) a trivia topic if they had initially rated their curiosity for the trivia question as high (Vogl et al., 2020).
- One study among children found that they were more likely to want to explore a topic if they perceived provided explanations about the topic as weak relative to strong (Mills et al., 2019).
- No study to date has directly examined whether the motivation to explore affects memory.

Study Objective

- This study examines whether a high motivation to explore predicts greater learning among young adults.

Hypotheses

1. Motivation to explore would predict better recall.
2. Items for which participants showed higher motivation to explore would also be rated as higher in curiosity.

Participants

- 79 young adults
  - Aged 18 – 30 years old (M= 19.87)
- Recruited from York's Undergraduate Research Participant Pool (URPP)
- No inclusion or exclusion criteria

Materials

- 20 trivia questions and explanations about uncommon animals
- Visuospatial task – eight 3D mental rotation tasks from the International Cognitive Ability Resource (2014)
- The Interest and Deprivation Type Epistemic Curiosity Model Measure (Litman & Spielberger, 2003)
  - Ten statements where participants rate how they generally feel regarding each item on a 4-point frequency scale (1 = almost never, 2 = sometimes, 3 = often, 4 = almost always)

Method

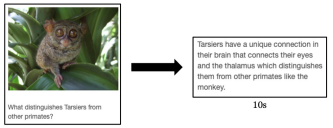
Online study

- This study adapted the learning paradigm used by Mills et al. (2019)
- Study involved passive partial deception where participants were told that the purpose of the study was to examine explanation quality to prevent bias memory performance

Method Continued

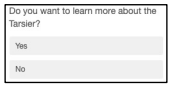
Study Phase

- Participants were asked to read 20 trivia questions about uncommon animals, one at a time
  - For each animal, they were presented with a picture of an animal, along with a general interest question about it
  - After 5 seconds, the explanation to the question was shown for 10 seconds



- Rated the quality of the explanation given on a scale of 1 to 10 (1 = very bad, 10 = very good)

- Indicated whether they wanted to learn more about the animal in Part 2 of the study or if they would rather learn about another animal



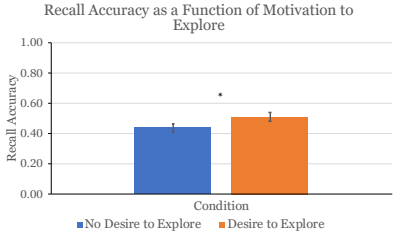
Visuospatial Task

- Participants were redirected to a visuospatial task and asked to complete as many 3D mental rotations as possible in 7.5 minutes

Recall Phase

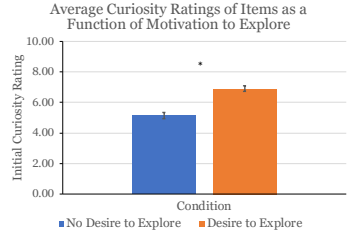
- Told that there is no Part 2 where they will learn more about the animals they selected; instead, they were presented with the same questions from the Study Phase one at a time and asked to provide the answer that was shown.
- Completed the Interest and Deprivation Type Epistemic Curiosity Model Measure
- Showed all the animals that were presented in Part 1, and asked to indicate on a scale of 1 to 10 (1 = not at all curious, 10 = extremely curious) how curious they were initially to learn the answer to the trivia question

Results



A paired samples t-test was conducted which indicated a significant difference in recall accuracy scores, $t(78) = -2.425$, $p = 0.018$.

Results Continued



A paired samples t-test was conducted which indicated a significant difference in participant's initial curiosity, $t(78) = -8.405$, $p < .001$.

Discussion

- The data supports the hypothesis that the motivation to explore predicts better recall memory in young adults
  - The trivia items where participants indicated they wanted to learn more about the uncommon animals were better encoded, leading to better recall (higher number of correct questions on the memory test)
- Our results further showed that "desire to explore" items were also those for which participants were more curious about. This finding supports work by Vogl et al. (2020) suggesting that curiosity is associated with a motivation to explore related information.
- To my knowledge, this is the first study to directly assess the effects of motivation to explore on episodic memory.
- Findings may offer insight into factors that drive better learning and memory. They also inform us on the nature of curiosity and how it may propel knowledge acquisition.

Limitations

- Could not ensure consistent testing environment as study was conducted online
- Possibility that strong sense of curiosity was not evoked in all participants to affect memory performance

Next Steps for Future Research

- Continue with more research that includes larger sample sizes and participants from different learning institutions
- Explore effective ways to evoke curiosity that can be translated into post-secondary education settings

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