Self-Generating Questions and Concept Mapping to Improve Long-term Recall Performance

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Abstract
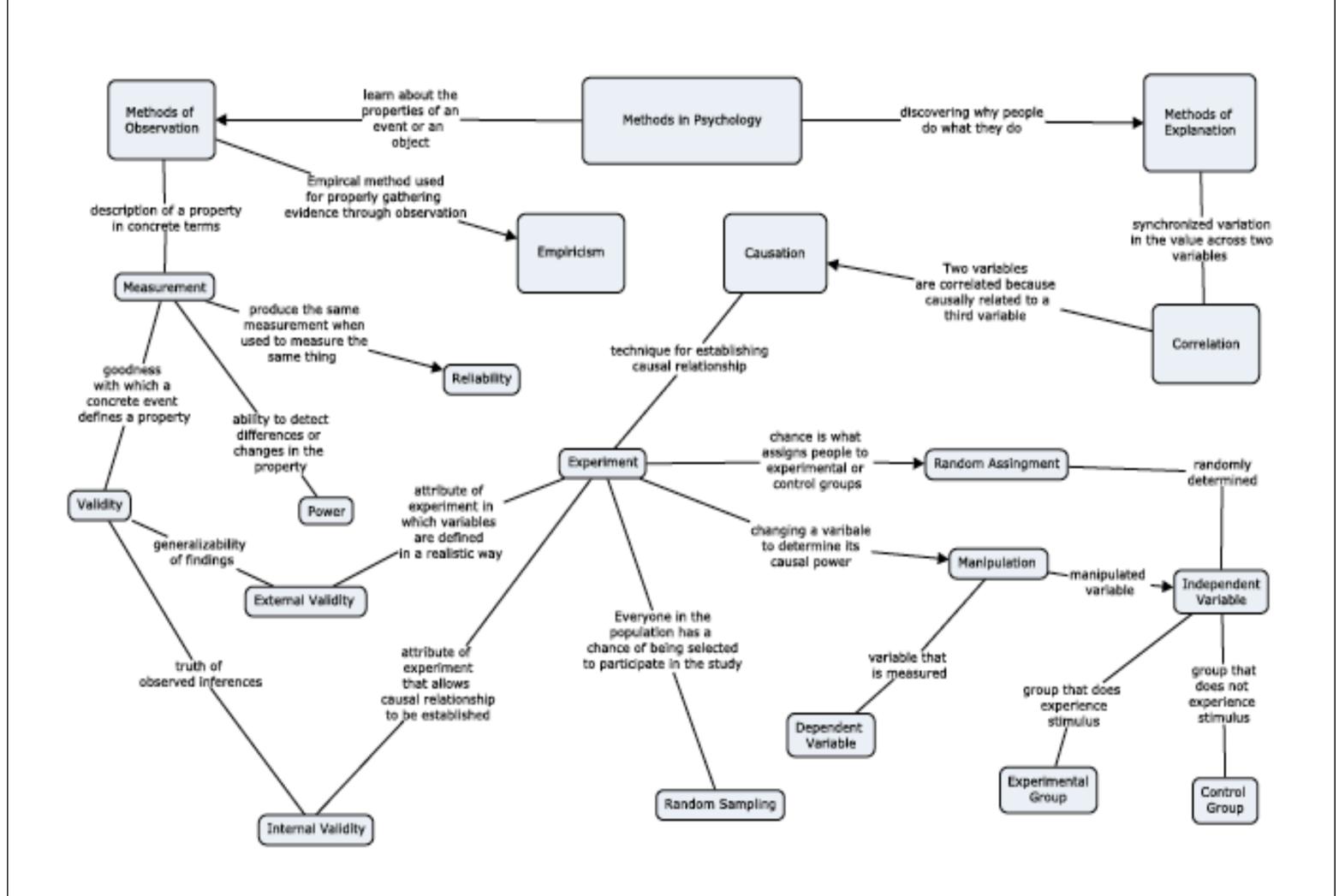
➢ Purpose: The purpose of the proposed study aims to investigate effortful learning techniques in relation to maximizing learning in the long term.

➢ With training often happening sporadically in many organizations, it is important to understand how we can maximize employee retention rates under organizational time constraints. The results of this study could provide insights into how organizations can improve their training programs to maximize learning.

➢ Past research has shown that individuals that engage in generative and elaborative learning techniques demonstrate a higher level of comprehension due to increased understanding across concepts (Brown, Roediger & McDaniel, 2014).

➢ The present study will build off previous studies that focused on the impact that generating questions and concept mapping can have on retention in the short term, by investigating the impact that they can have on long term retention, using an approximate 30 day retention interval (e.g. Weinstein, McDermott, & Roediger, 2010; Chang, Sung, & Chen, 2002)

Self-Generating Questions

➢ The idea that self-generating questions can improve recall comprehension is mainly attributed to the generation effect, in which information generating individuals are able to comprehend and recall information more effectively (Brown, et al., 2014).

➢ Bugg and McDaniel (2012) examined self-generating and answering questions. They divided the types of questions generated into two distinct categories: (a) detailed questions focusing on facts from the provided text and (b) conceptual questions focusing on linking concepts across the text.

➢ Results indicated that those that generated and answered conceptual questions performed significantly better on the conceptual questions then the other two study strategies (detailed questions and re-read).

Concept Mapping

➢ Concept mapping, at its root, is recognized as a manner by which learners can link cognitive structures of past knowledge with novel information in an organized and visual manner (e.g. Akinsanya & Williams, 2004; Novak & Gowin, 1984).

➢ A concept map consists of nodes that serve as essential concepts and then lines linking those nodes that define the relationship among concepts (Fiorella & Mayer, 2015).

➢ Chang, et al., (2002) explored concept mapping by examining the learning across participants that completed partially complete concept maps, corrected incorrect concept maps, and created concept maps. Results indicated that completing concept maps was beneficial for enhancing participant's ability to summarize material.

Hypotheses

Hypothesis 1: Self-generating questions will have a main effect on long-term retention.

Hypothesis 2: Concept mapping will have a main effect on long-term retention.

Hypothesis 3: Self-generating questions and concept mapping will have the largest effect on long-term retention.

Hypothesis 4: Self-generating questions and concept mapping will have a larger effect on long-term retention for students with a lower reading ability.

Methodology

➢ The experiment will take place in a laboratory setting and participants will be divided into four main conditions. All participants will be instructed to read three passages each and complete a task for each passage before engaging in a 24 question test. They will return three weeks later to participate in a final recall test.

➢ Long term retention of the information from the passages will serve as the dependent variable with the study condition serving as the control.

➢ The proposed study will also include the added element of examining participant reading level pre-intervention, to determine if elaborative and generative study strategies have a higher impact on low-performing participants when compared to the mean.

➢ Participants will be divided into the following conditions:

  • Participants in the study only condition (condition 1) will be instructed to read each passage and then study each passage

  • Participants in the generate questions condition (condition 2) will be instructed to read each passage and generate eight comprehension style questions for each passage,

  • Participants in the concept mapping plus study condition (condition 3) will be instructed to read a passage, study that passage and fill in a partially completed concept map for each passage

  • Participants in the concept mapping plus generate questions condition (condition 4) will be instructed to read each passage, generate questions for each passage and fill in a concept map for that passage

References

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