Evaluating Strategy Variability to Predict Recall Performance in Word-Pair Learning

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Introduction

Available literature suggests that engaging in memory strategy use during encoding improves later memory performance (e.g., Bower, 1970). There is great variation in strategy use between individuals. Variation in strategy use can be conceived in two different forms: (1) variability in WHAT strategies are used and (2) variability in HOW strategies are used. For variability in WHAT strategies are used, there are many strategies a learner may choose to potentially engage in. Examples include rote rehearsal, sentence generation, or visual imagery. The type of strategy a learner chooses will impact what is remembered later. For variability in HOW strategies are used, depending on the materials to be learned, different strategies are more or less beneficial to the learner. Expertise in strategy use will increase the overall memory performance of the learner. To examine expertise in strategy use, characteristics such as consistency (using the same strategy reliably) and discriminability (differentiating between similar cases to use different strategies for different stimuli) are essential. These characteristics can be measured using the Cochran-Weiss-Shanteau (CWS) ratio (Shanteau et al., 2002) which is a ratio of discrimination relative to consistency. CWS is commonly used in the domain of expertise.

Current Research

The goal of the current study is to test the construct validity of a retrospective report designed to assess strategy variability. Strategy variability will be assessed in two ways. First, what strategies participants report using during learning, and second, how learners use strategies. The study will determine if variability in CWS ratios are obtained, and if variability scores (both what and how) relate to final memory performance.

Methods

PARTICIPANTS:
- 73 participants were recruited from the university’s subject pool.
- No age or gender exclusions.
- Compensated with course credit or monetary incentive.

MATERIALS:
- MRC Photolinguisitc Database (Wilson, 1988) to generate sensible words.
- Edinburgh Associative Thesaurus (Kiss, Armstrong, Milroy, & Piper, 1973) to match associated words as a related pair.
- ARC Nonword Database (Rastle, Harrington, & Coltheart, 2003) to generate nonsense words.
- Word pairs were manipulated to consist of five different word types: Related – High Imagability, Related – Low Imagability, Unrelated – High Imagability, Unrelated – Low Imagability, and Nonsense words.

A total of 40 word pairs were created, with 8 pairs per category.

PROCEDURE:
- Participants completed a standard cued recall paradigm. First, participants completed the encoding portion where all word pairs were presented for 6 seconds. Then participants completed a self-paced retrieval portion, and finally participants retrospectively reported memory strategies used during learning.

DATA ANALYSIS:
Variability in WHAT strategies were used:
- Strategy Composite scores were calculated for each participant by taking the average score of all strategies they reported using.
- Visualization and Sentence Generation were scored as (+1).
- Rote Rehearsal and None were scored as (-1).

Variability in HOW strategies were used:
- CWS ratios were calculated for each participant.

Formula: $CWS = \frac{\text{Discriminability}}{\text{Consistency}}$

Where:
- Discriminability = Variance between categories of word pairs.
- Consistency = Variance within categories of word pairs.

Results

Sentence Generation (Verbal association) was the most frequent strategy used by participants in this study.

Conclusions and Future Research

- Results indicated that the variability in WHAT strategies are used during learning are more predictive of recall performance than the variability in HOW strategies are used.
- The more a learner is able to engage in beneficial strategies regardless of the materials to be learned, the greater the recall performance.
- Future research will examine recall performance on other memory tasks including separate and delayed cued recall tasks, to measure how strategy performance is related to recall on other memory tasks.

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References