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 Photolinguistic 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, & Colheart, 2003) to generate nonsense words.
- Word pairs were manipulated to consist of five different word types: Related – High Imageability, Related – Low Imageability, Unrelated – High Imagability, Unrelated – Low Imageability, and Nonsense words.

Methods Contd.

- 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.

1	2	3
During the first portion of the study the word pairs will be presented on the screen. Word 1 – Word 2 Please do your best to remember as many pairs as possible	You will be presented with the first word of each pair and asked to remember the second. Type your responses in the spaces provided. Word 1 - _____	Word 1 - Word 2 What strategy do you feel you used most to remember this pair? - Verbal association - Visual Imagery - Rote Rehearsal - None - Other

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:

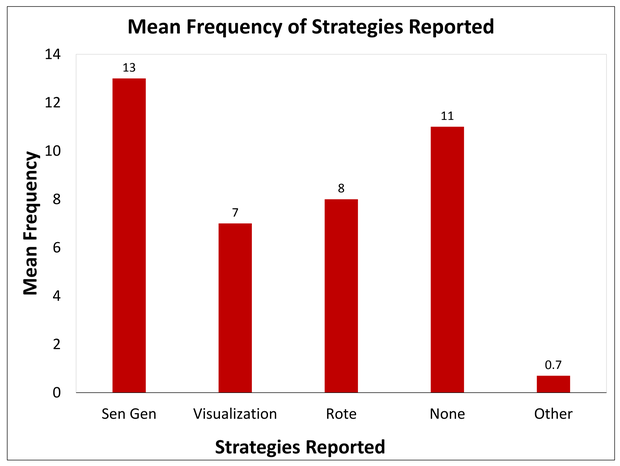
- CWS ratios were calculated for each participant.

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

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

Results

FIGURE 1



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

Results Contd.

Pearson's product-moment Correlation for CWS and Recall Accuracy is r (71) = .25, p = .03, BF_{10} = 1.93

FIGURE 2

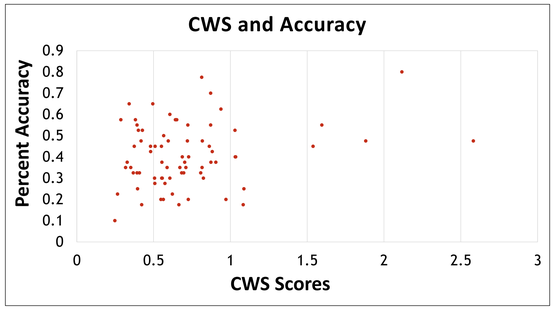
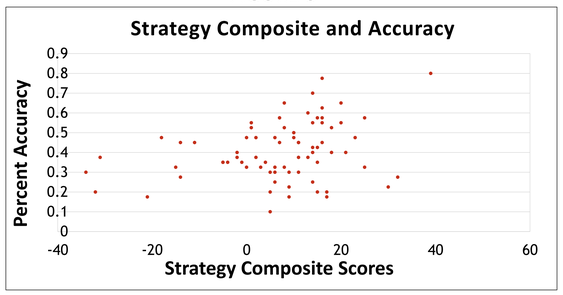


FIGURE 3



Pearson's product-moment Correlation for Strategy Component and Recall Accuracy is r (71) = .29, p = .01, BF_{10} = 3.83

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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