A Comparison of Immediate and Delayed Recall of Words and Images

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INTRODUCTION

Memory plays an important role in learning and everyday functioning. The human memory is known to fade over time without repetition of the information. Comparing the immediate and delayed recall of images versus words is the goal of this study. American philosopher and psychologist, Mary Whiton Calkins' 1898 study on the memory recall of visual and verbal memory found that participants recalled images significantly more than visual information (Calkins, 1898). This study replicates elements of Calkins' study with modern day methods.

figure 1: portrait of Mary Calkins

PURPOSE & HYPOTHESIS

The purpose of this experiment was to examine how time delays affect memory recall accuracy by testing immediate recall performance versus delayed recall performance within a short phase (~48 hours).

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We believe that participants will recall significantly fewer items after a delay than when recalling immediately after viewing stimuli, and that images will be recalled easier than words.

PARTICIPANTS

- Thirteen undergraduate students from Southern Oregon University participated.
- Recruited from psychology courses taught by the supervising professor.
- No demographic data or exclusion criteria were recorded.
- Each participant completed two sessions: one for immediate recall, and one 48 hours later for delayed recall.
- Participation was voluntary and anonymous.

MATERIALS AND METHODS

Materials

- 7 images & 7 words
- Delivered via embedded Google Slides
- 2 Google Forms for recall tasks one immediately after viewing slides and the another 48 hours after the first test.
- A within-subjects ANOVA was used to calculate the results

Procedure

- Day 1: slideshow → immediate recall

- Participants received Google Form containing: Informed Consent.
- A list of 7 words with accompanying images were presented through Google Slides.
- Immediately after the presentation, participants were prompted to write down all words they recalled from the presentation.

- 48 hours later: follow-up Form for delayed recall

- Participants were sent final Google Form after approximately 48 hours..
- Final form asked participants to recall as many words from Google Slides.

figure 2: example of slide shown to participants

Ball	Tree
Cup	Clock
Dog	Shoe
Chair	

figure 3: example words shown to participants

RESULTS

We found that participants performed significantly worse in memory recall after 48 hours then they did in the initial test after viewing the slideshow.

On average participants remembered two words less than they did initially, and using an ANOVA test we found that our results were statistically significant [$F(1, 22) = 28.56$, $p < .0001$].

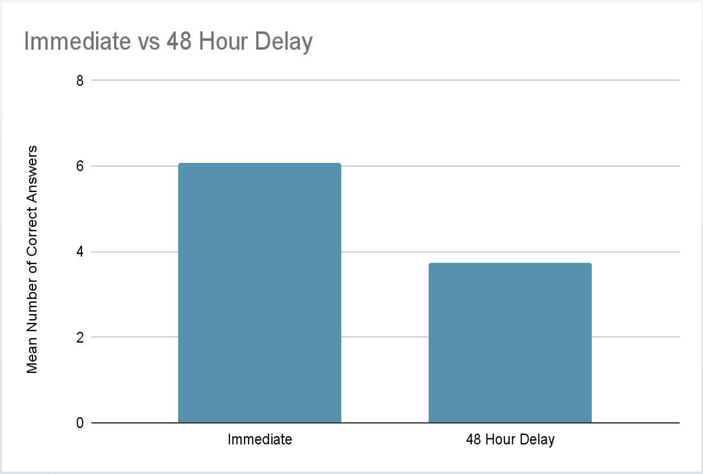

figure 4: bar chart comparing immediate vs delayed recall

standard weighted-means analysis

ANOVA Summary Independent Samples k=2

Source	SS	df	MS	F	P
Treatment [between groups]	32.6667	1	32.6667	28.56	<.0001
Error	25.1667	22	1.1439		

figure 5: ANOVA summary of participation recall scores

DISCUSSION

From our results we conclude that as time passes there is a negative relationship to memory recall. After 48 hours of delay, our participants performed significantly worse than they did initially.

We were limited by a slight mortality effect, with 17 participants completing the first test but only 13 completing the retest. We also did not collect any demographic information from our participants, so any effect of individual characteristics on memory recall is beyond the scope of this study to answer.

Future research could look at narrowing the time delay between initial test and retest, to see where the critical time delay is, as 48 hours may be beyond that threshold. Inversely, studies could investigate further time delays for the retest to see if there is any larger trend between time delay and accuracy.

REFERENCES

Calkins, M. W. (1898). A study of immediate and of delayed recall of the concrete and of the verbal. The Psychological Review, 5(5), 451–462.