THE INFLUENCE OF COLOR ON MEMORY RECALL IN VISUAL LEARNING

1. Abstract

This experimental case study tests whether color-coded study material improves memory recall compared to black-and-white notes. Using a between-subjects design and a word-pair recall task, the study assesses visual cognition in learning. The setup mimics real university-level experimental psychology assignments focused on **cognitive processes** and educational enhancement strategies.

2. Introduction

Visual cues significantly influence memory encoding and retrieval. Research suggests that **color enhances attention** and may act as a retrieval cue. This study investigates how **colored visual stimuli** compare to grayscale material in helping students remember word pairs.

3. Research Objective

To determine whether students who study from color-coded materials exhibit higher memory recall than those who study black-and-white versions of the same content.

4. Hypotheses

- H₀ (Null): Color-coded notes have no effect on memory recall compared to black-and-white notes.
- H1 (Alternate): Color-coded notes improve memory recall performance.

5. Methodology

Design

Between-Subjects Experimental Design

Participants

Group N Description

Color Group 25 Studied 20 color-coded word pairs

Group N Description

Grayscale Group 25 Studied same content in black-and-white

Procedure

- 1. Participants shown 20 unrelated word pairs (5 minutes).
- 2. After 24 hours, asked to recall the second word of each pair.
- 3. Total recall score (0–20) recorded.

6. Data Summary

Group	Mean Recall Score	SD
Color Group	16.2	2.5
Grayscale Group	12.7	2.8

7. Statistical Analysis

Independent Samples t-test

t(48)=4.58, p<0.001t(48) = 4.58, quad p < 0.001

- Cohen's $d = 1.27 \rightarrow Large$ effect size
- Result: Color group significantly outperformed grayscale group

8. Visualization

Bar Chart: Average Recall Scores

Study Format	Recall Score ↑	
-		
Color-Coded		
Black-and-Whit	e	

9. Discussion

The findings support the use of **color-coding in study material** as a simple cognitive tool to boost recall. The effect size indicates substantial practical importance, suggesting that students benefit from visual enhancement in material design.

Implications for Educational Psychology:

- Reinforces dual-coding theory (Paivio, 1991)
- Encourages visual design in pedagogy
- Demonstrates easy-to-implement intervention with measurable gains

Limitations:

- Only verbal material tested
- No control over participants' personal study habits
- Single exposure to content

10. Assignment Learning Outcomes

Skill	Applied Through
Experimental psychology design	Controlled setup, independent variable testing
Hypothesis testing	Clear null/alternate formulation and t-test use
Cognitive theory in education	Dual coding, memory recall in focus
APA-style research documentation	h Structure, visuals, tables, and p-values

11. Conclusion

This case study demonstrates how subtle design enhancements in educational material can yield significant cognitive benefits. For students, this model offers a template for experimental setups, especially in cognitive psychology and educational intervention assignments.

12. References

• Paivio, A. (1991). Dual coding theory: Retrospect and current status.

- Dzulkifli, M. A., & Mustafar, M. F. (2013). *The influence of colour on memory performance: A review*.
- Moreno, R. (2006). *Learning in high-tech and multimedia environments*.

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