



De La Salle University-Dasmariñas

**Scotopic Representational Forms on Iconic Memory Recall among High  
School Level Students from the Balik Aral Program of De La Salle  
University - Dasmariñas**

An Undergraduate Thesis Submitted  
To the Faculty of Behavioral Science Department  
College of Liberal Arts  
De La Salle University- Dasmariñas

In Partial Fulfillment  
Of the Requirements for the Degree  
Bachelor of Arts in Psychology

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April, 2012



## Abstract

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**Title:** Scotopic Representational Forms on Iconic Memory Recall among High School Level Students from the Balik Aral Program of De La Salle University - Dasmariñas

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**Funding Sources:** Parents

**Cost:** PHP 6000.00

**Date Started:** June 2011

**Date Completed:** April 2012

**Objective of the Study:**

### A. General

To find out the extent of memory capacities of teenagers in recalling texts and colors (colored and non-colored) under low light conditions



## **B. Specific**

### **Statement of the Problem**

The first set of problems that this study aimed to answer pertains to determining the level of memory recall on different test treatments. The following are the actual problem statements.

1. What is the level of memory recall on word representations in terms of:
  - 1.1. Achromatic
  - 1.2. Chromatic
2. What is the level of memory recall on picture representations in terms of:
  - 2.1. Achromatic
  - 2.2. Chromatic
3. Is there any significant difference in memory recall levels:
  - 3.1. Between achromatic word and picture representations
  - 3.2. Between chromatic word and picture representations
4. Is there any significant different in memory recall levels between word and picture representations on all treatments?



## **Scope and Delimitations**

The study primarily covers the recall aspect of memory and its implications on visual stimuli. The researchers structured the experiment in such a way that it would involve the recall process of retrieving data from the brain. Take note that the experiment does not involve the aspect of recognition – no cuing of visual stimuli is included in the process of the experiment.

The term “word” in this research refers to the written word form representation of a certain concept. It does entail the use of the word as in verbal/oral form (such as when one speaks the word).

The study deals with both word representation and picture representation of concepts. Both of these variables are visual stimuli. This study did not include any non-visual elements into play, other than in giving instructions. The study’s premise is only limited on the implications of word and picture representations on memory recall, and did not include any other mental processes.

While the study concentrates on color and iconicity levels of the variables, the study only minimally takes into consideration other visual factors, such as font size and style (for texts) and spatial attributes such as size (for images) (Acosta, 1988).

This paper is also not meant as a comparative study of the effects of environmental lighting conditions on memory. The researchers will exclusively use scotopic (low light) conditions as an environmental setup across all



treatments. The goal of the research still lies on the comparison of the effect of chromatic or achromatic word and picture representations on memory recall.

Unbeknownst to the researchers, the Balik Aral population appeared to be declining as the months go by. The assessment of the number of students who can participate in our study yielded a much fewer number as it was originally intended. From the original 120 students during the first semester (the time when the first few chapters of this paper was written), the number has dropped to a mere 40 students during the second semester. Despite this immense decline in population, in line with the desire to still use the subjects for analysis, the researchers decided to still go on with the remaining 40 students of the program, designating 10 students per each group.

### **Methodology**

The group has chosen the Experimental Design in order to assess the effects of the treatment/ interaction used by the variables of the study. The design aims to deal with both verbal and iconic representation of concepts which are visual stimuli. Pre-test is no longer used, due to the lack of intervention in between tests. According to Elmes, et.al, the goal of a good experimental design is to minimize extraneous variable or uncontrolled variation to increase the possibility that an experiment will produce a valid result. The first design decision an experimenter must make is assigning subjects to the various levels of the independent variable. (Elmes, Kantowitz, Roediger, 2003).



Specifically, the Post test Control Group Design, which is a type of experimental design in which the experimental and control groups are measured and compared after implementation of an intervention. Comparisons are made **only** after the intervention, since this design assumes that the two groups are equivalent other than the randomly assigned intervention. Between-group differences are used to determine treatment effects (Campbell, D. and J. Stanley, 1963). The control group design doesn't receive the levels of interest of the independent variable. It is controlled by the experimenter and simply doesn't receive any treatment (Elmes, Kantowitz, Roediger, 2003).

### **Findings**

#### **1. Level of Memory Recall on Word Representations**

- 1.1. For Achromatic Word Representations, the Iconic Memory Recall level is "Average"
- 1.2. For Chromatic Word Representations, the Iconic Memory Recall level is also "Average"

#### **2. Level of Memory Recall on Picture Representations**

- 2.1. For Achromatic Picture Representations, the Iconic Memory Recall level is "High"
- 2.2. For Chromatic Picture Representations, the Iconic Memory Recall level is also "High"



### **3. Significant Difference in Memory Recall Levels**

**3.1.** Between Achromatic Word and Picture Representations, there is a significant difference

**3.2.** Between Chromatic Word and Picture Representations, there is also a significant difference

### **4. Significant Difference Across All Treatments**

- There is a significant difference in Iconic Memory Recall levels across all treatments

### **Conclusions**

Based on the analysis and the interpretations of the data gathered, the researchers found out the following:

1. The experiment's findings show that texts, whether chromatic or achromatic showed an average iconic level when it comes to memory recall, whereas picture representation served as a better iconic memory cue since the result of the experiment yielded high results for both chromatic and achromatic picture representations.
2. When the iconic representations were paired according to control group and experimental group; Achromatic Pictures and Achromatic Texts, Chromatic Pictures and Chromatic Texts respectively, the results of the experiment showed that that picture representations are much easier to



memorize than text representations regardless if it had color or not since there was not much difference between AP and CP.

3. The rods cells of the eyes which are active during scotopic vision makes colored (chromatic) materials not much different than non-colored (achromatic) materials. As such, colors may not bring about a significant effect when materials are observed under low light conditions.
4. Even with low light conditions, the human eye and memory are still able to grasp the difference between the effects of pictures and texts on memory, as evident with the results. Unlike in previous literatures, the researchers triggered the subject's scotopic vision. It appears that to an extent memory still works even when stimulus is viewed under low light conditions. The bottom line: picture treatments, regardless of application of (or the lack of) color are much easier to understand for students who doesn't have enough lighting during their study at night.

### **Recommendations**

Based on the findings and conclusions, the researchers recommend the following:

1. **For Future Researchers.** The study conducted only involved the comparison of treatments when under low light conditions. The researchers did not examine the difference between the effects of light in memorizing stimulus. A comparison between mesopic and scotopic vision





on memory is a viable research idea to follow up on what this paper has studied on.

- 2. For Educators.** The research revealed the superiority of pictures over words as far as memory aids are concerned. It is therefore advised for teachers to adapt to more visually appealing lectures in order to increase the chances that the information being imparted will be memorized and utilized better than relying on full-page texts. However, the study is not, in any way, advising against the use of text books, rather, the use of images can be used in line with text-books as learning aids.
- 3. For Book Authors and Publishers.** It can be advised that the books contain more images (illustrations, diagrams, etc.) in order for student to be able to study the material. Again, the study is in no way advising against the use text books, rather, the text books should also learn to utilize pictures as an effective aid in learning.
- 4. Lastly, for Students,** it can be advised for them to try to make good use of images when studying their lessons. Making their own notes illustrated in such a manner that they can easily memorize would greatly help for them to master their lessons and achieve high grades. In the case of this research, the method can also be helpful when studying with less than adequate lighting.



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