

# The Effect of Organization on Memory.

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## ABSTRACT

The experiment investigated the effect of organization on memory. Specifically, the memory performance of 26 participants of various ages and backgrounds was tested after being randomly assigned to an organized or disorganized condition. Two hierarchies were created that contained various species of hummingbirds, woodpeckers, cats, and whales. Participants assigned to the organized condition were given an organized hierarchy of the animals and participants assigned to the disorganized condition were given a disorganized hierarchy. Each participant was given two minutes to study their respective hierarchy and were then asked to recall and write down as many items as they could remember on a blank hierarchy. It was hypothesized that the participants assigned to the disorganized condition would not perform as well as participants on the organized condition on the memory task. The results supported the hypothesis; participants in the organized condition performed significantly better on the memory test. These results are discussed in terms of their importance from current theories of memory. Future research recommendations are also discussed.

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## 1. Introduction

Memory is a vital part of human experience, as it is used daily in any setting, whether at school, work, or in our personal life. Memory allows people to draw upon the past to comprehend and behave in the present. The skill to recall information shapes our understanding of the world and, in turn, how we interact with our surroundings. Researchers have designed and conducted studies for over a century to explore how information is encoded, stored, and recalled (Myers & DeWall, 2018). This broad body of research has sculpted our current understanding of factors that lead to improved memory; whether studying for an important exam or recalling important

information for a job, anything that can aid in better memorization can be deemed crucial.

One factor that has been discovered to influence memory is organization. For example, in a classic experiment conducted by D'Agostino (1969), it was found that blocked versus random presentation of items in a study phase had a positive impact on both recognition and recall. In another classic study by Jacoby (1972), participants were given a categorized list of words in either a blocked or random format and then required to recognize those words during a test phase. The results demonstrated that participants recognized more words in the blocked than random condition, but only when the words were presented within their

categories in the test phase and when they were in the same order as during the study phase.

Bower et al. (1969) also examined the effect of organization on memory, however, in that study, hierarchical organization was used. Specifically, Bower et al. asked participants to recall words that had been either organized in a hierarchy during the study phase or in random order. The same list of words was used for both conditions. It was found that participants recalled more words when they had been presented in a hierarchically organized manner, providing further evidence that organization aligns with memory.

To explain the benefit of organization on memory, the retrieval hypothesis has been suggested (Britton, et al., 1980). In a series of experiments, Britton et al. presented information to participants in either high content structure or low content structure format, structured content being that which is predictably organized. The results demonstrated that free recall was higher in the high versus low structured condition. Moreover, various retrieval cues reduced the recallability across the low and high conditions, lending support to the retrieval hypothesis.

The present experiment was a simplified replication of the study conducted by Bower et al. (1969). While the Bower et al. study was conducted through trials, the current experiment investigated the effect of organization on memory in a more simplistic way, with only one trial. Specifically, participants were randomly assigned to either an organized or disorganized condition and were asked to study a hierarchy broken down into 25 words. Both hierarchies consisted of various species of hummingbirds, woodpeckers, cats, and whales, all further categorized down to specific names. In the organized hierarchy,

the animals were placed within their appropriate categories and in the disorganized hierarchy they were not. Participants were given two minutes to memorize the items in their respective hierarchy. After the two minutes elapsed, they were asked to write them down on a blank hierarchy. From prior memory research on memorization, it was predicted that participants in the organized condition would perform better than those in the disorganized condition.

## **2. Methods**

### *2.1 Participants*

Twenty-six participants of various ages, genders, backgrounds were tested. The participants were friends and family of the experimenter and were randomly assigned to the organized or disorganized conditions. The participants in the organized group had ages that ranged from 16 to 50 years, with a median age of 21 years. There were 6 cisgender females and 7 cisgender males in the group. The remaining 13 participants constituted the disorganized condition. The ages of this group ranged from 17 to 54 years, with a median age of 24 years. This group also consisted of 6 cisgender females and 7 cisgender males.

### *2.2 Materials and Apparatus*

The materials used in this experiment consisted of a list of 25 animal-related words. The words were divided into birds and mammals. The birds and mammals were then further divided into either cats and whales or hummingbirds and woodpeckers respectively. They were then finally broken down into types of names of cats, whales, hummingbirds, and woodpeckers. These words were presented to the participant as an

organized or disorganized hierarchy consisting of general animal species. In the organized hierarchy, the animals were placed within their appropriate categories and in the disorganized hierarchy they were not (see the Appendix for the organized and disorganized hierarchies). The words were written in 11-point Calibri font in black on a white 8.5 x 11-inch piece of paper. A timer was used to keep track of the time while participants reviewed the words.

### *2.3 Procedure*

Participants were approached and asked if they would be interested in participating in a brief experiment. If they agreed, they were asked to read and sign a consent form. Once signed, each participant was randomly assigned to either the disorganized or organized condition. Those in the disorganized condition were given the disorganized hierarchy and those assigned to the organized condition were given the organized hierarchy. Participants were asked to study their respective hierarchy for 2 minutes. After 2 minutes had elapsed, the hierarchy was removed, and they were then provided with a writing utensil and a separate piece of 8.5 x 11-inch paper with a blank hierarchy. The participants were asked to write down their age and gender on the sheet and all the words they could recall. The participants were then fully debriefed and thanked for their time.

### *2.4 Design*

The current experiment used a single-factor between-group design. The independent variable was organization; the two levels were organized and disorganized. The dependent variable was the number of words recalled.

## **3. Results**

The level of significance set in this experiment was .05. The average number of words recalled in the organized condition was 14.31 ( $SD = 4.69$ ), and the average number of words recalled in the disorganized condition was 4.37 ( $SD = 1.89$ ). See Figure 1 for a summary of the descriptive statistics. These data were analyzed using a  $t$ -test, and the results were statistically significant,  $t(24) = 7.29$ ,  $p < .0001$ , suggesting that the organized condition reported more words than the disorganized condition.

## **4. Discussion**

The hypothesis under investigation in the current report was that participants in the disorganized condition would not perform as well as those in an organized condition on the recall task. The findings supported this hypothesis.

Early work on memory has shown that participants presented with information in a disorganized manner do not perform as well as participants with information in an organized manner (Bower et al., 1969). Consistent with previous research, the present study demonstrated this pattern. Although the current study provides valuable insight into the effect of different hierarchical organizations on memory, there is a potential limitation. Specifically, participants could have just guessed the words that belonged to the category since the list was about animals making the task recognition rather than recall, thus preventing participants from actively recalling the words.

The results of the current study have important implications for memory improvement. With the knowledge that processing information in an organized

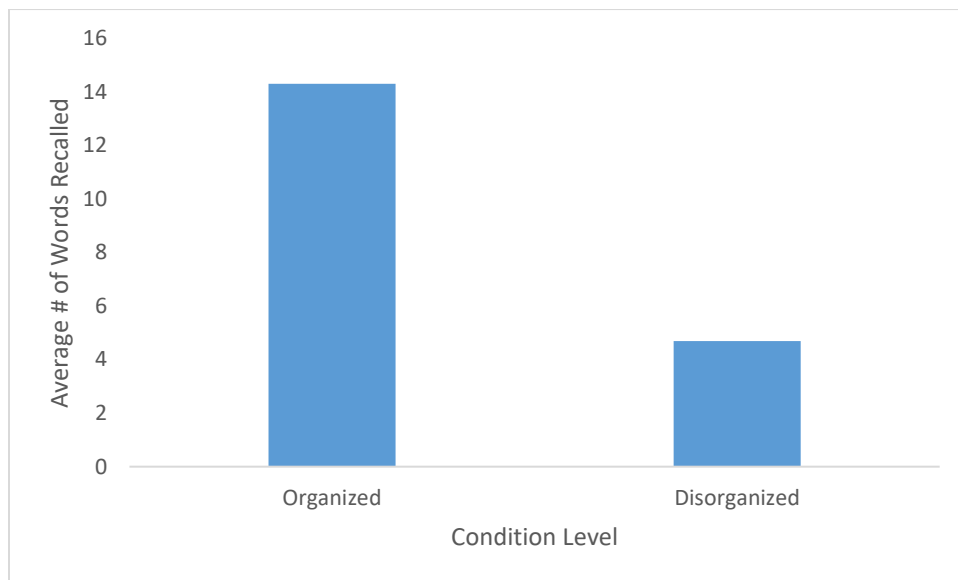
manner leads to better memory of that information, one can improve memory performance through the use of more organized methods. Future researchers may consider testing different forms of organization across different ages and populations, as it may provide insight into how organization can benefit different groups of people

## References

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**Figure 1**

*The Average Number of Words Recalled in the Organized and Disorganized Condition*



## Appendix

### The Hierarchies Used in the Organized and Disorganized Conditions

