

# Effect of color and word length on memory performance



## Abstract

The purpose of this study was to examine the effect of color and word length on memory performance. Seventy nine undergraduate college students from Disted college, aged from 19 to 23 of both male and female genders were recruited for the study. The study was a 3×2 mixed method design, There are two independent variables in this experiment which are word length and colors of words, while the dependent variable is memory performance. Results showed that there was no significant change in colored words on memory performance, while differences in word length showed a significant increase in memory performance. The results supported our secondary hypothesis which claimed that participants were more able to remember shorter words than longer words. On the contrary, our primary hypothesis was not supported. In conclusion, word length may have a positive impact on memory performance.

## Introduction

It is common knowledge that we humans are more attracted to colorful objects like pictures or colored films than black and white colors. It is also well known that young children, especially babies and toddlers are particularly attracted to shiny and striking colors. Such instances may have piqued the curiosity of scholars in the old days to answer the question why people are more attracted to colorful stimulus, sadly for the scholars the capacity to study this topic is not readily available until recent times.

Since ancient antiquity, colors on clothes not only made people look more distinct from one another, certain colors also inspire awe and shows status

and power. For example, in the east Chinese emperors have always wore gold color to signify their status as son of heaven, while in the west Roman emperors and the aristocrats wear purple so show their status in society.

In today's society, an individual in the academic field is expected to be able to do many tasks, one of the most important skills in our society is to be able to remember important things. For example, in college we constantly need to remember important terms and words, these information that we have learned is to be tested in quizzes and exams. College students that do not have good attention focus and memory are looked down upon by their lecturers and peers because they mostly under perform in their academic performance. Fortunately for this type of college students, as time progress more efficient methods of studying and memorizing is being discovered or proposed. One of these methods is mind mapping, the method of mind mapping basically uses the right side (color and creativity) together with the left side (words and logic) of the brain to increase memory performance (Astrid, n. d).

As such, it can be seen that both color and words could be essential component in memory performance. Working together, both aspects could be used to aid or test the performance of a students memory capability. Similar to mind maps, word length and different kind of colors could affect the overall memory performance.

### Theoretical Framework

The human mind has a very complicated way of processing and memorizing information. Among the many theories that attempted to explain how <https://assignbuster.com/effect-of-color-and-word-length-on-memory-performance/>

memory works, Baddeley's working memory model seemed to provide one of the best explanations. This model was created by Baddeley and Hitch to improve upon the rather obsolete multi-store model, they argued that the multi-store model was too simplified. Their working memory model seeks to explain that short term memory has components/subsystems that actively manipulates information that it receives (Miyake & Shah, 1999). The model has four important components which were the " Central Executive", " Visuo-Spatial Sketchpad", " phonological loop" and " Episodic Buffer". They further elaborated that working memory was made up of the central executive which controls the operation of two subsystems: the phonological loop and the visuo-spatial sketch pad. The final component, episodic buffer was meant to be a back up store that connects working memory with long term memory (McLeod, 2008).

The working memory model relates to color and word length due to the visuo-spatial sketchpad and the phonological loop. The visuo-spatial sketchpad stores visual information such as word shapes and colors for a short period of time (Logie, 2002). Our working memory was very focused on color because colored objects of an items leaves a deeper impression on our memory (Cercone Learning, n. d). While, some people tend to recall words better when they pronounce it while memorizing, their ability to recall is affected by the word length, which is stored in the phonological loop (Logie, 2002).

#### Past Literature

As time goes by more and more past research was made to address the issue of colored words and word length on memory performance. Although most research only investigated on colored words and memory performance or word length on memory performance, their contribution were highly regarded. One such study was made by Mustafar & Dzulkifli (2013), their study was focused on investigating the effect of ground color on memory performance. In their study, they invited 90 undergraduate students , age ranges from 19 to 22 to participate in the experiment. They conducted their experiment by using between group design, there was three groups of participant that were given different treatments. The first group was given red colored background slides, while the second group was given background slides with no color. The third group was be given background slides that have a combination of color and no-color background to be shown alternately. Their research results found that most shape with colored background will be recalled better than shape with non-color background.

Another research was made by Campoy (2008) which was made to investigate the effect of word length in short-term memory.

The research invited 50 undergraduate university students. The research was conducted by using two participants in each session in two different sound-attenuated booths. In the booths the computers shows a stimulus (five-word series study list) presented in block letters at the rate 300 ms per word. After a delay 3, 000 ms, the second sequence (test list) was shown in lower case at the same speed. Lastly, a question mark was revealed and the participants will press key “ 1” or “ 2” when they decided the word orders in <https://assignbuster.com/effect-of-color-and-word-length-on-memory-performance/>

both series were different or same. Results revealed that a list of short four-phoneme words were better remembered than a lists of long six-phoneme words.

Among the many past research, there was one research that stands out the most. Research done by Le & Castillo (2009) was meant to investigate on the effects of color and word length on verbal working memory. In this research, 61 business professionals were invited to participate. The research was conducted by first requesting participants to memorize short words (12 seconds) and long words (30 seconds), then participants were requested to recall short words within 24 seconds and long words within 60 seconds. Participants was then asked to do demographic questionnaires and include them together with their answer papers. The results showed that five-syllable words were the most hard to remember, with memory performance difference much more obvious between Caucasians and none-Caucasians.

#### Description of Study

In this study, we were much different compared to past studies because we focused on both length of words and color of words, as stated in our ERB (refer to Appendix D) Compared to past research like the one done by Huchendorf who mainly focuses on the effects of color on memory or the one done by Neath & Naire that was focused on word length and short term memory, ours were more complex and in-dept because we analyze both aspects. Among the many studies that was made, our experiment most resembles the one by Le & Castillo. In Le & Castillo, one of the main aspects they investigated was the capacity of memory among sixty one

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business professionals. Compared to their experiment, our experiment not only was focused on a different sample, which is the college student sample, we also have a larger amount of participants which provides us a greater variety of cultural background and memory capability.

The aim of this study was to investigate the effect of color and word length on memory performance. Our experiment was conducted by separating all our participants into two equally large sized groups, then the participants were directed to the short word or long word experiment room to do the experiment. In the rooms the participants were given one minute to attempt to memorize as many words as they can and then given another minute to recall and write down the words they can remember, participants were then given one minute to cool down and rest before starting the next treatment. In our experiment, we outlined two hypotheses that were written in our ERB. Based on past research by Huchendorf (2007), Le & Castillo (2009) and Neath & Naire (1995), we hypothesized that warm colored words is easier to remember than cool colored words and shorter word length is easier to be remembered than longer word length.

#### Practical Implication of Study

An implication of this study was that the finding could be used in class rooms to assist teachers and lecturers in guiding students. Teachers can use this knowledge to teach students on doing mind maps and teach them to use highlighters to highlight certain words, the highlighted words will increase the capability of a student's memory.

#### Methods

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## Design

The experiment was an experimental type research design that was meant to investigate the cause and effect of the independent and dependent variable. The research have two independent variables and three levels. The independent variables were words length (single syllable/three syllables) and color of the words (black), warm color (red) and the cool color (green). The dependent variable was using memory performance of number of correct words recalled. Also, the research is a 3×2 mixed method design, the reason the research was using mixed method was because the design contained elements from between and within subject.

## Participants

There was approximately seventy nine participants that came from different races, the participants were also recruited from the many different courses of Disted college. Their age range was between 19 and 23 years old while their gender was both male and female. The students participated the experiment due to their own willingness and initiative. Furthermore, experimenters had requested permission from the DISTED Student council to obtain lecture schedules to see which class was available and permission from individual lecturers to recruit students. The participants was recruited through random sampling method ; the experimenters had approached students around DISTED college cafeteria, library and pre-selected classes.

## Material

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The experiment had used two computers and two projectors to depict the different colored and worded experiment slides, another material was the computer software Microsoft power point, specifically the slides was made using the software. The twenty words from each of the color worded slides (refer to Appendix B) are retrieved from MRC Psycholinguistic Database, University of Western Australia, School of Psychology. Other materials include SPSS program to calculate the results output (refer to Appendix C) and smart phone built in stop watches that was used to time the experiment sessions (timing one minute for memorizing words or one minute to recall the list of words).

### Procedure

The study was conducted in two classrooms each equipped with a projector, the experiment was conducted across several sessions with a random amount of participants in each session. The participants were first given a brief explanation about the nature and purpose of the experiment and then the experimenters requested the participants to sign the consent form (refer to Appendix A).

Next, each participant was randomly assigned by counting one and two, it is arranged like that so that both groups would be equal in number . The first group was asked to remain in the current room, while the second group was brought to the other room by one of the experimenters. Also, the first group was given a list of shorter words (one syllable) with three different colored treatments ; control color (black) , warm color (red) and cool color (green).

Similar to the first group, the second group was given the same treatment, except that the word length was longer (three syllables).

The experiment was started when participants were given one minute to remember a list of black colored words from the projected slides on screen and another 1 minute to write it down on the paper, after that the participants were given one minute to cool down. Once the participants were ready for the next treatment, the participants was given one minute to remember a list of red colored words and then another minute to write it down, then the participants were given another minute to cool down before the last treatment. Finally, the participants was given other minute to remember a list of green colored words and one minute to write it down.

Once all the words that can be recalled was written down, the experimenters collected the papers from the participants and the participants were dismissed.

## Discussion

As seen in the results section written above, our experiments outcome concluded that color of words generally do not affect memory performance. However, our results also showed that disregarding the length of words, colored words have significant relationship with memory performance. On the other hand, word length has a positively significant relationship with memory performance. Among our two hypotheses, the word length and memory performance hypothesis was highly supported by our results.

More specifically, our hypothesis that mentioned short words were more easily remembered than longer words.

The results of our study was consistent and supported by past literature, research findings by Campoy (2008) and Le & Castillo (2009) were two such examples. Their research results had shown that people found it easier to remember words with less syllables or phonemes. The consensus between the two past literature and our experiment was that, lesser amount of syllables allowed working memory to process information faster and more efficiently. However, our experiment was not supported by Mustafar & Dzulkifli (2013). Their results did not coincide with our results on color, they found that shapes with colored background was recalled better than shape with non-color background. A possible reason on why our results was not the same as some past research was because, we focused our experiment on both color and word length, instead of just one of it.

It should be acknowledged that there was one failed manipulations in our experiment, that particular failure was our colored wordmanipulation, it is due to this reason that our first hypothesis failed. Also, there was a few confounding variables that might have affected the experiment. One of the confounding variable was the experiments starting time, the experimenters had noted that there were some inaccuracies on the timing of some experiment sessions. Another reason was due to the hour we conducted our experiment. For example, we conducted our experiment on late afternoon, it could be that most participants were weary, fatigued and frustrated after a long day in class, such distractions would leave the participants less capable to focus on our experiment. The third <https://assignbuster.com/effect-of-color-and-word-length-on-memory-performance/>

confounding variable was due to temperature, one of the rooms was rather cold while the other was rather warm, it should be noted that the differences in room temperature could affect the performance of the participants. In order to solve these problems, the experimenters had taken steps such as adjusting the airconditioning of both rooms to be the same and set timers to start the experiments simultaneously.

Throughout our experiment, we realized certain important things that would prove beneficial for future studies. Experiments made in future could be improved upon by gathering a larger amount of participants from different age, race and background, doing so would have given the future experimenters a better represented result based on a more diverse data. Future experiments could also be improved by using culturally neutral words, the usage of such words would have allowed certain participants to perform better without a cultural word barrier. Another suggestion was that future experiments could have done their experiments earlier, this is suggested so that the participants would be able to do the experiment on their peaked performance.

The implication of this study was that it would benefit any individual that is in the academic world or the business world. A student would have found this experiment helpful because our results would have assisted them in their academic performance. Our experiment results would have shown them that making short notes would have made them more efficient in their studies. Teachers and lecturers could also use our experiment results to form a more effective study materials, study materials that are shorter and simpler would be more effective for a students studies. Another benefit was that <https://assignbuster.com/effect-of-color-and-word-length-on-memory-performance/>

advertising corporations could have used our experiment results to assist them in creating an attractive and memorable advertisement in the minds of consumers.

As a final conclusion, this study was conducted to investigate the relationship between word length, word color and memory performance. The findings showed that participants found it easier to remember words that are shorter and more warm colored or longer words with cooler color. Further studies should be conducted with a larger sample population.