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**Abstract:**

Short-term memory is the capacity of the brain to hold a small amount of information for a short period of time.  When trying to recall information, a “distracter” can making it harder for you to access/recall the original information while using your short-term memory.  A distractor is defined as something, or someone, that disrupts your thought process, and an example of a distractor could be a sound from your phone when a text message comes through, which makes you forget the next sentence you were about to write on a homework question.  The complexity of the object presented to an individual impacts their the short-term memory, and when having a distractor, the short-term memory is disrupted.  The study was created using a computer program called “Scratch”, and with it, each test subject was shown a series of words using different distractions like the color of the words on each trial.  The subjects were asked to recall the order of the words, and to conclude, the studies shown that as the words became more complex, the lack of words the subject could recall.  Our future research would be to to see how fast the participants could recall the name of the word that was presented, by having them immediately write the name of the color after they see it.

**Introduction:**

Short term memory is the capacity of the brain to hold a small amount of information for a short period of time.  Short term memory, is stored for in a matter of seconds.  A “distracter” can be defined as something that disrupts your thought process making it harder for you to access/recall the original information while using your short term memory,   An example of a distractor could be a sound from your phone when a text message comes through, which makes you forget the next sentence you were about to write on a homework question. G. A. Alvarez. Studies have shown that visual short term memory was a system that stores visual memory for a couple of seconds so that it can be used for ongoing tasks.  We knew that using colors to help memorize something, attracts more attention to the object, making it easier to remember.  We wanted to know how it was easier to remember something when using color.  We sought out to discover how using color, or not using color can help a person memorize information more easily.

**Methods:**

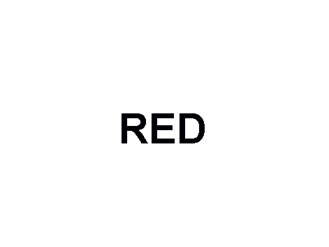
To test our research question 30 test subjects between the ages of 14-50 were shown a series of words. We used a Scratch computer program which is a program created by MIT. There were three sections to said Scratch program: the first started with a slide that read “press the spacebar when you are ready to begin.”  After the subject pressed the spacebar, a slide would appear that said, “You will now see a series of three words. After you see these words, a piece of paper will be given to you. On this piece of paper you will be asked to recall the order of the three words.” This slide was shown for 10 seconds. Next three colors appeared on three successive slides, these colors were: RED, GREEN, BLUE. All words were written in black font and shown for 2 seconds (See figure 1) following these slides, another appeared that said “record the order of the words you just saw.” After this, we gave the test subject a piece of paper with a 1x4 table on it. The boxes were labeled “black”, with columns 3, 5, and 7.

After the test subject recorded what they believed were the three words shown in the second box, the same basic process was followed, except with five words. Then with seven words. Once the subject filled in what they believed were the seven words, a new slide appeared. This slide read “Press the up arrow when you are ready to begin.” After doing so, the second test would begin.

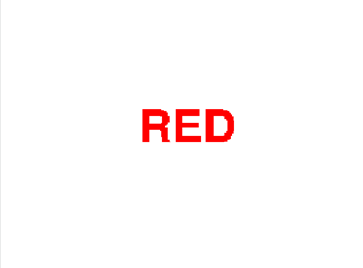
The second test was very much like the first, but a new 1x4 table was given to the subject with the label “right” on it. This was to indicate that all the words of the colors would be written in their *right* color. For example, red would be written in red, and blue would be written in blue (see figure 2)

The third test was very much like the first and second, but a new 1x4 table was given to the subject with the label “wrong” on it. This was to indicate that all the words of the colors would be written in their *wrong* color. The wrong colors would be chosen at random. For example, Red would be written in either: blue, green, or yellow (see figure 3)

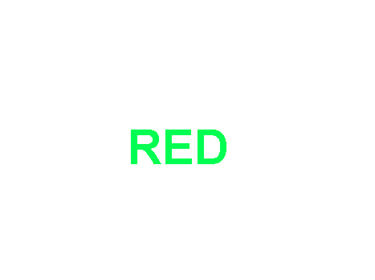
**Figure 1**

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**Figure 2**

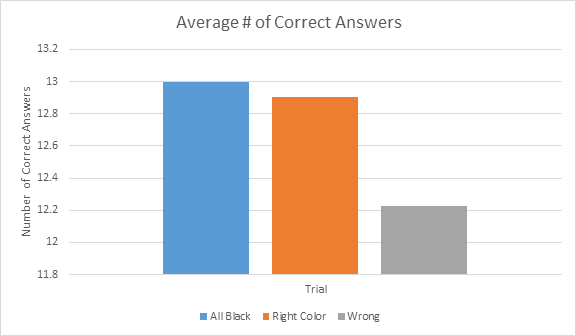
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**Figure 3**

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**Results:**

|  |  |
| --- | --- |
| comparison between: | P value: |
| Black 3 vs right 3  Black 5 vs right 5  Black 7 vs right 7 | p= 1.0  p= 0.007  p= 0.5555 |
| Black 3 vs. wrong 3  Black 5 vs. wrong 5  Black 7 vs. wrong 7 | p= 0.3256  p= 0.3657  p= 0.8234 |



This shows that as the complexity of the object increased, the amount correct decreased.

**Discussion:**

We found out that when writing the same color text of the name of the color shown, is almost as easy as remembering them in black text.  The data shows the average of number of correctly recalled words, for using color text to represent the given color was 12.9%, and using black text was a 13%.  The average of incorrect colors recalled was a 12.2%.  The respondents were able to correctly remember the wrong color versus using black, by almost a whole percentage difference.  The data explains, that it is easier to remember something in a short time when using colors.  It also shows that a solid color, like black, is significant when trying to remember something in a short period of time.  When having a distractor, like when the text color of the word doesn’t match the word, it gets you less focused, and can’t let you remember things as much. While our hypothesis is not prove, there is evidence that supports our claim.  As the words being tested became more complex, we see p-values that are more and more significant (see the table in result section).  Once the tests reached the wrong color section, one can see that the p value increased significantly.

Bibliography :

Alvarez, G. A., & Cavanagh, P.. (2004). The Capacity of Visual Short-Term Memory Is Set Both by Visual Information Load and by Number of Objects. *Psychological Science*, *15*(2), 106–111. Retrieved from <http://www.jstor.org/stable/40063936>

Spence, I., Wong, P., Rusan, M., & Rastegar, N.. (2006). How Color Enhances Visual Memory for Natural Scenes. *Psychological Science*, *17*(1), 1–6. Retrieved from <http://www.jstor.org/stable/40064341>

Olsson, H., Poom, L., & Treisman, A.. (2005). Visual Memory Needs Categories. *Proceedings of the National Academy of Sciences of the United States of America*, *102*(24), 8776–8780. Retrieved from <http://www.jstor.org/stable/3375788>

Loftus, E. F.. (2004). Memories of Things Unseen. *Current Directions in Psychological Science*, *13*(4), 145–147. Retrieved from <http://www.jstor.org/stable/20182936>

Lee, H., & Vecera, S. P.. (2005). Visual Cognition Influences Early Vision: The Role of Visual Short-Term Memory in Amodal Completion. *Psychological Science*, *16*(10), 763–768. Retrieved from <http://www.jstor.org/stable/40064311>

Magnotti J., Goodman A., Daniel T., Elmore L., Wright A. & Katz J.(2013). Visual Object Complexity Limits Pigeon Short-Term Memory. *Behav Processes. 93.* 31-38. Retreived From <http://www.ncbi.nlm.nih.gov/pubmed/23098992>

Zechmeister E. (1976). Short-Term Memory. *The American Journal of Psychology, 89*. 344-350. Retrieved from

<http://www.ncbi.nlm.nih.gov/pubmed/10855426>