A research on understanding cognitive processes of the stroop effect:

Psychology

Abstract

The Stroop Effect is a classic cognitive study that was replicated during this experiment. The aim of this study was to better understand cognitive processes specifically with interference. To achieve that aim we had to measure how much time it took for the participants of this study to read a list of colors in black and white and compare it to how much time it took for participants to read each color of the words where each color that it named was printed in a different color of ink. The colors were red, blue, purple, brown, and green and no other color of ink was used. Participants were told to read the black and white list of colors first and then read the colors of the words in the second list next (the list named colors and each color was printed in a different ink that it named). Each of the participants were timed on each of the lists that they read. The independent variable was the lists of colors and the dependent variable was how much time it took for each participant to read each list. The results reflected that it took more time for the participants to read the color list than it did for them to read the black and white lists.

Introduction

The Stroop Effect is a " study of interference in serial verbal reactions" (Classics in History). This effect was discovered by John Ridley Stroop in 1935. He did several tests with both male and female participants in order to better understand cognitive processes specifically with interference.

The Stroop effect is the study that is being replicated. Participants were high school students that are all over 16 years of age including both male and

female. They were told to read two lists of words that were both naming the colors red, blue, green, purple, and brown. All of the words were printed and equal amount of times in each list. However, the first list was printed in all black ink and the second list was printed in the colors red, blue, green, purple, and brown. None of the colors were printed in the same ink as the color that it named. There were 15 participants.

The Stroop effect is important because gives more insight on cognitive processes so

that they may be better understood. It also gives psychologists clues about how the most fundamental cognitive processes work.

Methods

Design:

The type of sampling used in this experiment was opportunity sampling. The participants were taken from one of the local school classes because that is what was available at the time. In order to keep it ethical each participant was given a permission slip stating the confidentiality of the experiment. Repeated measures were used in this experiment because each participant had to read two lists of words, the first one being the control. The independent variable was the lists of words and the dependent variable was the measured time on how long it took for each participant to read both sets of words.

Materials:

This experiment required several materials including a two lists of color names (the colors were red, blue, purple, green, and brown) one of which

was printed in color and the other in black and white. The black and white list served as the control. The color list was printed in the colors listed above. No color was ever printed in the color that it named. When the experiment was conducted the lists were on a powerpoint. The other materials were a timer, a pencil (or pen) a piece of paper to record the results and either a laptop with the words displayed or two pieces of paper containing each list.

Procedure:

The participants were taken into a quiet room and briefed individually. They were told to read each list of words as fast and as smoothly as possible. Beforehand they were also given the color names in order for them to know what the colors were. They read the black and white list first in order to get a control time and they were give a small (about 30 Seconds) break in between. While they were reading the lists one person was standing beside them in order to record the amount of mistakes they made on each list. Another person was recording their time at the same time. After all of the participants had gone they were gathered in a group as a whole and debriefed.

Participants:

The participants in this experiment were a group of 16-18 year olds taken from a class from a local school. They were volunteers from the class and included a diverse group. They came from different backgrounds. As a result not just one group inside of the school was represented. The sample was taken from a class because that was what was available to the experiment.

The participants of this experiment involved 11 males and 4 females. The average time on the Black and White tests was 47. 8 seconds and the average time for the Color test was 2 minutes and 12. 2 seconds. The difference in the times indicates that the interference of the color while reading the names of colors had an impact on the participant's' ability to read the names of the colors. This supports the hypothesis that reading the name of a color when it is printed in a different color interferes with our cognitive ability to read enough to make us process the word at a slower rate. The results of participant #5 is the outlier in this pool of data because it was 19 seconds more than the longest time on the color test making the average of the time on the test a bit longer than it would be without the outlier.

Discussion:

The results of this experiment showed that it took longer for participants to read the black and white list than took for participants to read the color of each word on the color list because the unfamiliar action of identifying the color of the word instead of the word itself interfered with their cognitive ability. In every instance with each participant, the time it took to identify the color of each word in the color test was significantly longer than it was to just read the word of each color on the black and white test. Even the fastest participant (participant #14) on the color test had a significantly lower time on the black and white test. Participant #14 completed the black and white test in 34 seconds and completed the color test in 1 minute and 22 seconds. Although they had the fastest time on the color test, their time was still much longer than their time on the black and white test. This reflects the

original results of Stroop’s experiment and shows how much interference can occur with cognitive ability when people do not automatically read the words and pay attention to the color.

Errors in methodology included about 2 interruptions during the experiment when a previous participant came into the room looking for a cell phone. This caused the participants that were currently doing their tests to become distracted for a brief period of time. The time that the participants were interrupted was not recorded which was another error in the methodology.

Further research into the cognitive ability of the human mind can be continued even with this experiment by having different age groups and cultures participate in this experiment. their brains can also be scanned prior to the experiment to compare how different brain scans compare to the different results of the study.