CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
Kanika Khemka

Project Number
35777

Project Title
The Impact of Warped Words on the Stroop Effect

Abstract

Objectives/Goals
The objective is to find out if 'warping' the words impact the Stroop Effect.

Methods/Materials
To test how warped words would impact the Stroop Effect, I designed 6 tests. To collect accurate test times, I sought my brother's help to write a program that recorded the time of each test. Using an IPad I then tested 90 people aged 7 to 88. I collected demographic data from test takers to analyze if different demographics impacted the results. To analyze the results I took "color square patches" test as the "control", and normalized all test results as percent of this time for each test taker. Then I averaged results for each demographic segment in Google Docs.

Results
Average time taken for the six tests in least time to most time order were color names written in 1. same ink color, 2. black ink, 3. warped fonts in same ink color, 4. colored square patches with no name, 5. warped font in different ink color, and 6. normal font in different ink colors (the original Stroop Effect test case).

Demographic analysis indicated that younger kids had least Stroop Effect. As you grow older, the Stroop Effect was more prominent. The Stroop Effect was gender neutral as also concluded in the original research by Stroop. Education level had similar impact as age. Primary school showed least Stroop Effect, while High School+ folks showed higher effect, and the postgraduates were actually the slowest. Due to lack in ethnic diversity in my data sample, differences due to ethnicity could not be studied.

Conclusions/Discussion
Contrary to my hypothesis, warping the words actually reduced the impact of the Stroop Effect in all demographic segments except in children. The Stroop Effect happens due to the confusion created in the brain by contradicting results from two of its primary cognitive functions - reading and color recognition. If reading function concludes a different color name than the actual ink color, it slows the brain's response in saying the ink color. However, with warped words, the reading function was slowed, reducing confusion in the brain, resulting in faster decision.

The results also concluded that both Stroop effect and impact of warped words was more for older and higher educated folks then children. Which means that as brain matures more, the confusion of cognitive functions takes longer to resolve. Such tests can be used to identify brain disorders.

Summary Statement
In this project I studied how our brain reacts to the confusion between its different cognitive functions by testing if the warped words impact the Strrop effect.

Help Received
My brother who is a UCLA computer Science under graduate student helped write the Java Script program that I used for collecting accurate test time readings. My parents and teacher helped by reviewing and providing their feedback to improve.