



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

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Project Title Reading the Stroop Effect with the Cambridge Word Scramble Theory on the Anterior Cingulate Cortex	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective was to prove that the hindrance caused by the Cambridge Word Scramble integrated with the Stroop effect can be directly correlated to inefficiency while multitasking in the Anterior Cingulate Cortex.</p> <p>Methods/Materials In order to collect objective data, we used 64 high school freshmen whom we did not know. After receiving informed consent, we tested them with 10 positive control tests (congruence between name of the color and color of the word), 10 interference tests (incongruence between the name of the color and color of the word), 10 positive scramble control tests (congruence between name of the color and color of the word with the word scrambled), and 10 interference scramble tests (incongruence between the name of the color and color of the word with the word scrambled). During testing, we used: 3 pens, 3 pieces of paper, 3 stopwatches, and snacks. We instructed each volunteer: a) You will be given strips of paper containing a sequence of words printed in colored ink. b) The ink colors used are red, blue, green, brown, orange, black, and purple. c) The task is to call out the ink color of each word as quickly as possible without making a mistake. d) If you struggle to name a color, try until you answer accurately, and only then can you move on to the next word. Each participant took all four of the tests, while we timed how long it took them.</p> <p>Results The positive test took an average of 5.7 seconds complete, the interference test, 9.4 seconds, the positive scramble test, 6.8 seconds, and the interference scramble test, 9.2 seconds. The positive test took 3 percent of the subjects the longest to complete the interference test, 53 percent, the positive scramble test, 6 percent and the interference scramble test 38 percent.</p> <p>Conclusions/Discussion Overall, our experiment forced the brain to dismiss the habitual function of reading a word, and find the actual color of it, which was a different action than it was used to. Our subjects took a longer amount of time when deciphering the color of the word. Since the brain can still recognize the word quite easily with the Scramble effect, our data did not show a significant amount of difference in the time it took to read the scrambled words compared to the positive test. Based on a compilation of our results, we found that multitasking is generally inefficient, because subjects were unable to perform two basic, simultaneous tasks.</p>	
Summary Statement We examined the most basic form of multitasking by comparing two well-known cognitive exercises in a specific region of the brain.	
Help Received Our advisor, Mrs. Joanne Quan, allowed us to use her room to conduct testing, helped recruit our subjects, and distributed the consent forms.	