



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Anna E. Killaly	Project Number J0718
Project Title The Effect of Caffeinated Beverages on Problem Solving and Short Term Memory	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Hypothesis 1: Consumers of caffeine will have higher test performance after consuming the beverage than their test performance before consuming the beverage. Hypothesis 2: Performance increase for subjects consuming caffeine will be greater than subjects who do not consume caffeine.</p> <p>Methods/Materials The following materials were needed: a quiet and distraction-free location, volunteers, tape measure, bathroom scale, caffeinated diet Coca Cola, decaffeinated diet Coca-Cola, disposable cups, computer, printer, paper, pens, playing cards and timer. Ten subjects were recruited and completed the experiment. They were randomly assigned to consume caffeinated or decaffeinated diet Coca-Cola. Height, weight, and resting heart rate were measured before completing 3 short tests: math quiz of 25 addition questions of 2 digit numbers, card memory test of matching 5 pairs of playing cards and word memory test from a list of 20 simple nouns. Performance was measured: Math Test (number correct in one minute); Card Memory Test (time to complete); and Word Memory Test (number correctly recalled in two minutes). Subjects blindly consumed 8 ounces of diet Coca-Cola and waited for 30 minutes for absorption. Heart rate was measured and same three forms of tests were repeated but with different questions, cards or word list. Test results were recorded for pre-drink and post-drink and then compared.</p> <p>Results Hypothesis 1 was supported in the math and card memory tests but not word memory test; drinkers of caffeinated diet Coca-Cola performed better on math and card memory tests but worse on word memory tests after consuming the drink. Hypothesis 2 was supported in the card memory test but not in the math test or word memory test; drinkers of caffeinated diet Coca-Cola had greater performance increases than those who consumed decaffeinated diet Coca-Cola only in the case of the card memory tests.</p> <p>Conclusions/Discussion Mixed results suggest that consuming caffeinated beverages does not lead to improved problem solving and short-term memory function. Support for this argument was only seen in the card-memory test, however the support may be because caffeine improves physical reaction time and the speed of turning over the playing cards in this test. The argument that caffeinated beverages improve brain function is not supported by these experiments; students should not use caffeinated drinks to get better grades or cram for tests.</p>	
Summary Statement Do caffeinated soft drinks improve brain functions such as problem solving and short- term memory-recall?	
Help Received Father helped with data analysis.	