



# CALIFORNIA STATE SCIENCE FAIR 2013 PROJECT SUMMARY

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| <b>Name(s)</b><br><b>Olivia D. Songster</b>   | <b>Project Number</b><br><b>S0422</b> |
| <b>Project Title</b><br><b>The Placebo Effect: Caffeinated vs. Decaffeinated Coffee</b>   |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>Human subjects will show physical and mental signs of caffeine use regardless of the caffeine content of their beverages. They should feel "better" emotionally and physically, have an increase in blood pressure, and be more focused by the end of two testing periods.</p> <p><b>Methods/Materials</b><br/>This experiment required caffeinated coffee, decaffeinated coffee, the Operation! board game, and a blood pressure cuff. The subjects (20) took a series of tests before and after drinking a cup of coffee. Their blood pressure was recorded every 15 minutes. The test was performed twice per subject on separate days.</p> <p><b>Results</b><br/>The majority of the data trends increased steadily until the 30 and 45 minute marks, when they either stayed the same or decreased. The drawings from the subjects show that there was a general loss of focus around 30-45 minutes in; this focus was regained for the last round of tests.<br/>This experiment was performed such that all of the subjects did the tests at once and were given the opportunity to openly discuss how they were feeling with each other. If someone who had caffeinated started to show signs of the caffeine, such as more flushed cheeks or a slight headache [in some cases], before long, the subjects who had decaffeinated stated they had the same symptoms.</p> <p><b>Conclusions/Discussion</b><br/>Looking at the results of this experiment, it's clear to see that drinking decaffeinated and caffeinated coffee can yield similar results. The decaffeinated averages of how each subject felt and looked deeply resembled the caffeinated averages; however, they weren't exactly identical. In terms of blood pressure averages, the decaffeinated averages generally followed their own patterns separate from the caffeinated averages.<br/>The Placebo Effect played a significant role in this experiment. The subjects were not aware of the fact that they were given decaffeinated coffee until all of the data had been collected; ergo, they must have subconsciously convinced themselves that drinking [perceived caffeinated] coffee would make them feel happier and more energetic.</p> |                                       |
| <b>Summary Statement</b><br>In an effort to understand the placebo effect, subjects were monitored after drinking decaffeinated coffee that they thought contained caffeine..   |                                       |
| <b>Help Received</b><br>Used classroom space at Technology High School under the supervision of Dr. Joseph Immel  |                                       |