



# CALIFORNIA STATE SCIENCE FAIR

## 2011 PROJECT SUMMARY

Name(s) <b>Jaclyn N. Lundberg</b>	Project Number <b>S0425</b>
<b>Project Title</b> <b>Finding the Region of the Brain Linked to Addiction</b>	
<b>Objectives/Goals</b> This experiment uses the Stroop test, a psychological test first performed by J. Ridley Stroop, which targets the frontal lobe of the human brain, specifically the anterior cingulate cortex. The anterior cingulate cortex functions as an intermediary between higher cognitive thinking and basic cognitive thinking.	<b>Abstract</b> The Stroop test was implemented on the control group, females 18-65 who rarely drank, and the experimental group, females 18-65 with a history of addiction. Each participant was asked to read off a set of words, which demanded a different set of responses to the same stimuli (Stroop, 1935). The reactions of the participants were timed and recorded.
<b>Methods/Materials</b> The Stroop test was implemented on the control group, females 18-65 who rarely drank, and the experimental group, females 18-65 with a history of addiction. Each participant was asked to read off a set of words, which demanded a different set of responses to the same stimuli (Stroop, 1935). The reactions of the participants were timed and recorded.	<b>Results</b> The data results concluded that there is a significantly slower average time of reactions of the experimental group, which validates the hypothesis that the anterior cingulate was affected in adults with a history of addiction. When applying the t-test, the t-test variable was 2.208 (equal variances assumed and not assumed) with an alpha level of 0.05 and a confidence level of 95 percent at 58 degrees of freedom, and the critical value for this 95 percent interval is 2.00, which concludes that the t-test variable rejects the hypothesis null.
<b>Conclusions/Discussion</b> For further research, MRI studies could be used to analyze the anterior cingulate and its effects on addiction more in-depth. Also, recently researchers have experimented with pacemakers in the brain for mental illness patients. These techniques may be able to be applied to addicts to introduce new neurological pathways, and this is another option for possible further research. Other regions of the brain, such as the insula, another region of the frontal lobe should be analyzed to see which other regions in the brain play a key part in addiction.	
<b>Summary Statement</b> Using the Stroop Test, which is a neurological test for the anterior cingulate of the brain, it was concluded that the anterior cingulate of addicts is neurologically different when compared to non-addicts.	
<b>Help Received</b> Help from House of Hope Addiction Center, San Pedro to provide subjects for experimental group	