



# CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

<b>Name(s)</b> Celeste J. Romano	<b>Project Number</b> <b>S0423</b>
<b>Project Title</b> <b>The Effect of Sleep Deprivation on Students' Ability to Discern Facial Emotions</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this project was to investigate the effect of sleep deprivation on students' ability to discern facial emotions. Previous research has shown contradictory results, with some studies demonstrating activation of the area of the brain involved with social interactions, and others showing impairment. A 2009 study performed a sleep deprivation experiment using "Pictures of Facial Affect" (POFA) by Paul Ekman. I designed a similar experiment, with the hypothesis that if high school students obtain less than six hours of sleep, it will reduce their ability to accurately recognize facial emotions. I also hypothesized that female students would show a greater difference of scores in a sleep deprived state than male students. Finally, I hypothesized that I would see an increase in the time it took students to complete the test while in a sleep deprived state.</p> <p><b>Methods/Materials</b> The POFA images were organized by emotion (happy, sad, anger, disgust, fear, surprise, neutral) and level of difficulty into two folders, Test 1 (rested) and Test 2 (sleep deprived), for a total of 25 images per test. The images were uploaded to Test 1 and Test 2 on Quizstar.com, and each test was assigned to a class folder. Thirty students (15 female and 15 male) participated in the study. Participants performed Test 1 at 7:30 a.m., after sleeping for a minimum of six hours the night before. Participants performed Test 2 at 5:00 a.m. five days later, after a minimum of 22 hours of sleep deprivation in a supervised setting. Both tests were performed under supervision.</p> <p><b>Results</b> Between Tests 1 and 2, there was a mean score difference of -0.20 for females and a mean score difference of -0.13 for males. A two-tailed T-test concluded that these differences were not significant. There was a mean time difference of 51 seconds for females and a mean time difference of 16 seconds for males. A two-tailed T-test concluded that these differences were significant.</p> <p><b>Conclusions/Discussion</b> In conclusion, high school students' ability to discern facial emotions in a sleep deprived state is not significantly different from their ability to discern facial emotions in a rested state. However, the time it takes them to analyze facial emotions is extended.</p>	
<b>Summary Statement</b> I studied the effect of sleep deprivation on high school students' ability to discern the seven major facial emotions.	
<b>Help Received</b> Project advisor helped recruit participants; Mother and project advisor supervised sleep deprivation setting; Parents provided suggestions for paper	