



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Nanami A. Sunaga</b>	<b>Project Number</b> <b>S0317</b>
<b>Project Title</b> <b>Mozart Effect During Spatial-Temporal Testing</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The cortical firing patterns used in spatial-temporal reasoning are strikingly similar to the patterns used in Mozart's music. This phenomenon introduces the "Mozart Effect," or the prediction that Mozart's music has a causal relationship to higher brain functions, such as spatial-temporal reasoning. Most studies on the Mozart Effect have all focused on the Mozart music's after-effects--the enhancement of one's spatial-temporal abilities. However, there has been little or no research on the effects of the music during spatial-temporal tasks. Therefore, it was significant to measure the change in spatial-temporal reasoning abilities while listening to Mozart. The results would help prove whether there is indeed a causal relationship between Mozart's music and spatial-temporal reasoning in the brain.</p> <p><b>Methods/Materials</b> Twenty-four high school musicians and Twenty-one nonmusicians were tested for effects of Mozart's music before or during a spatial-temporal reasoning test. The individuals were divided into three groups--the control, during-music group, and after-music group. All subjects first took a timed base test consisting of ten paper-cutting and folding problems. Then, each group took a second, similar timed test under their corresponding conditions. Results were based on the changes (improvement or no improvement) in scores and times.</p> <p><b>Results</b> Significantly, the after-music group performed much more quickly than the during-music group, as was predicted. In addition, the changes in scores of each group followed the trends found in previous Mozart Effect studies#those who listened to Mozart did improve their scores more than those who did not. Therefore, Mozart's music does appear to aid in spatial-temporal reasoning by stimulating the structurally similar cortical firing patterns of the brain.</p> <p><b>Conclusions/Discussion</b> The differences in scores between the groups could not be justified because chi-square tests did not yield a low enough p-value. However, the statistical test did prove the differences in time taken to be significant enough to support the hypothesis. It was determined that the during-music group took longer to complete the task than the after music group because of the predictions that music and spatial-temporal reasoning may be using similar firing patterns in the brain. Therefore, the experiment supported a causal relationship between Mozart's music and spatial-temporal reasoning.</p>	
<b>Summary Statement</b> Because past experiments have focused on the after-effects of Mozart's music on spatial-temporal reasoning, I tested for the effects of his music during spatial-temporal reasoning	
<b>Help Received</b> Mother drove me to buy supplies, mentor proofread my proposal	