



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Tarah Franklin; Kaitlyn Kennett</b>	<b>Project Number</b> <b>S0307</b>
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**Project Title**  
**Pump Up the Volume, Bring Down the Grade? The Effects of Audio Stimulation on Mathematical Test Performance**

**Abstract**

**Objectives/Goals**  
 If 40 individuals [indivs.] take 4 similar math tests, each test taken while listening to a louder volume [vol.], then each indiv. will receive the highest % w/ the lowest vol. (52-72.8dB) & receive the lowest % w/ the loudest vol. (68-85.3dB).

**Methods/Materials**  
 The project began by recording chatter in the cafeteria. Next, 40 subjects [subjs] were tested in 4 timed trials, each on a different day in a semi-secluded room consisting of the test taker & the supervisor. The subjs were given a math test consisting of 4 math principals(+, -, \*, ÷). The 1st trial was in silence to set a control grade & time for the rest of the test. In the 2nd trial, subjs were introduced to a low vol. (52-72.8dB) of the pre-recorded noise through speakers (6" apart), in the 3rd trial the vol. increased to a moderate vol. (63.6-80.6dB) & in the 4th trial the vol. increased to the loudest vol. (68-85.3dB). Each test was then individually graded, timed, & compared to the subj's control test [ct] to evaluate the change [chg] in % correct on each test. If the subj's % was the same for 2 tests, then the faster time (if present) was considered a higher %.

**Results**  
 The data was analyzed in 4 categories: overall mean %, % of subjs w/ the highest % per test, largest % increase from each test & the ct, & largest % decrease from each test & the ct. The mean score was 88% correct for test 1, 78% for test 2, 83% for test 3, & 85% for test 4. 28% received highest % in silence, 15% in a low vol., 20% in a moderate vol., & 38% in the loudest vol. Using the formula (# correct on vol. test - # correct on 1st test/# correct on 1st test) we found the chg in % from the control to the 3 tests. When compared w/ the ct, 15% of tested subjs had a greater pos. (+) % chg in test 2, 20% in test 3, & 38% in test 4, 28% showed a neg. (-) chg only. 39% got highest (-) % chg in test 2, 24% in test 3, & 15% in test 4, 20% showed (+) chg only. Due to classifying 1 person in more than 1 group, the calculations for largest % decrease used 41 subjs rather than 40. The person was categorized in both due to a same score & time on test 2 & 3.

**Conclusions/Discussion**  
 95% showed that indivs. do not score the highest w/ the lowest vol.(52-72.8dB) & score the lowest w/ the highest vol.(68-85.3dB). Overall, each test varied in respect to the indiv., rather than a pattern.

**Summary Statement**  
 Testing the effects of noise volume on mathematical test performance.

**Help Received**  
 Dayl Thomas helped convert our pre-recorded chatter into decibel levels, Mr. Grubb helped prefect our board and abstract