



CALIFORNIA STATE SCIENCE FAIR 2013 PROJECT SUMMARY

Name(s) William Humphreys	Project Number S0409
Project Title The Correlation of Harmony and Dissonance in Color and Sound	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Is there a mathematical correlation in frequency between color and sound, and can the human brain detect similar frequency spans in color and sound?</p> <p>Methods/Materials This is all about colors that look good together and notes that sound good together. There are two parts to this project: seeing if there is a mathematical relationship between color and sound, and (if there is) if the human brain can detect it. I went about this by first measuring and comparing certain color's frequency and certain note's frequency. I found the frequency distance between two certain colors (such as red and blue) and two certain notes (such as C and G) to be proportional. As it turns out, the color scale ROYGBIV (Red, Orange, Yellow, Green, Blue, Indigo, and Violet) matches up proportionally in frequency to any major scale. Now I needed to see if the brain would detect this relationship. To do this, I played the subject two to three harmonious and/or dissonant note combinations, and at the same time showed them a selection of four different harmonious and dissonant color combinations using an iPad application I created. They then picked the color combination they thought matched the notes they were hearing. There were twenty tests with four possible selections each, with only one right answer. It was difficult for some people to connect the two senses of sight and hearing, and it showed in the testing.</p> <p>Results There is a mathematical correlation between color and sound. On the human testing side of this project, out of the twenty people I tested, the average correct score was five out of twenty. This means that the test subjects could not correlate the sound with the color combinations, and picked randomly.</p> <p>Conclusions/Discussion The fact that there is a correlation between color and sound is not surprising. After all, they can both be measured in frequency and they both travel in similar ways. However I was expecting the brain to be able to detect the harmonic and dissonant spans of frequencies between color and sound. This test was conducted entirely on high school students ages fifteen-sixteen. Most of these teens are not proficient in art and/or music, which leads to an interesting question: Would adults with experience and/or training in art or music get more tests correct? Would their brains be more fine-tuned to color and sound, and therefore be able to pick out the correlating combinations offered?</p>	
Summary Statement Is there a mathematical correlation in frequency between color and sound, and can the human brain detect similar frequency spans in color and sound?	
Help Received Father helped print the board.	