



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Christopher R. Swenson	Project Number J0632
Project Title Matching Pitches: How Close Can You Come?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This experiment examines the effect of age, gender, and musical experience on tonal memory and pitch matching. It seeks to determine whether the accuracy of pitch matching and tonal memory is dependent on the age of the subject. The hypothesis is that pitch matching ability will improve as the age of subjects increases to age 11, when hearing is most sensitive), and then will drop as subjects get older.</p> <p>Methods/Materials Using a computer with Internet access, a subject navigates to a web page to participate in the experiment - a series of three pitch-matching trials. He or she clicks on a button, which plays a random pitch for a short duration. The subject uses a slider control to raise or lower another tone until the tone matches the original one. In order to test tonal memory, the subject is not allowed to replay the original pitch. A short survey provides information on age, gender, as well as instrumental or vocal musical experience.</p> <p>Results The actual results of the experiment, however, show that pitch accuracy does not correlate to the subject's age. The collected data illustrates a slight correlation between gender and pitch matching ability, with males having a small advantage over females. Correlation is evident between the subject's stated musical experience and pitch-matching accuracy. In particular, vocal musical experience proves the best predictor of the ability to match pitches accurately. Because singing involves pitch matching when practicing with other singers or being accompanied by an instrument, development of vocal musical skill allows more accurate pitch matching in this experiment. A vocal student relies heavily on aural skills to produce an accurate pitch that blends with other singers or musical accompaniment. Subjects with instrumental experience, on the other hand, do not perform as accurately. One possible reason for this is that beginning students often have their instruments tuned for them, or receive help in tuning. In addition, playing a percussive instrument, such as the piano or drums, does not involve pitch matching to play the instrument accurately or even very skillfully.</p>	
Summary Statement This experiment examines the effect of age, gender, and musical experience on tonal memory and pitch matching.	
Help Received Father helped deploy finished application on Amazon Web Services (AWS).	