



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title Battle for Tonal Domination: Do Violin Students Have Better Relative Pitch than Piano Students?	
Objectives/Goals My goal was to test my hypothesis that students who play the violin will hear differences in pitch the better than those who play the piano because violinists have to focus on relative pitch more in order to play their instrument in tune. I predicted that pianists would have fairly good relative pitch and that non-musicians would have the least ability to hear different pitches.	
Abstract	
Methods/Materials 1.) I used the computer program Audacity to create twenty pairs of tones, either slightly higher, slightly lower or the same as one another, plus four example tone pairs for subjects to listen to for practice. I burned all the tones onto a CD, one track for each tone pair. 2.) I located three subject pools of similar ages, skill levels and gender: a group of non-musicians, ages 6 and up, a group of trained pianists, ages 6 and up, and a group of trained violinists, ages 6 and up. 3.) I tested one to six subjects at a time, depending on their availability. I made sure they all could hear the CD player equally well. I read each group of subjects the exact same introductory script, including the four example tone pairs. I then played each tone pair, stopping between each track for the subjects to all indicate on their test sheet whether they thought the second tone was the same, lower, or higher than the first. 4.) I compared how many answers were correct on the violinists# test, the pianists# and the non-musicians#. I also looked at the results for boys vs girls, years of study, playing level, and age.	
Results All pianists combined scored an average of sixty-nine percent correct. All violinists combined, all ages, scored an average of sixty-five percent correct. All non-musicians, of all ages combined scored an average of forty-two percent correct.	
Conclusions/Discussion My hypothesis was not fully supported by my results-pianists had a slightly higher average test score compared to violinists. Both sets of musicians scored better than the non-musicians. The results were close between pianists and violinists, but clearly the subjects with musical training had better relative pitch than the subjects with no musical training. I can think of two explanations for this: Either that Relative Pitch can be learned and not just inherited or that people born with relative pitch are more likely to become musicians.	
Summary Statement Does learning to play the violin, which requires the player to adjust his pitch, improve a student#s ear over learning another instrument or no instrument?	
Help Received My teacher, Mrs. Frier, advised me throughout the project; My dad installed Audacity and showed me how to use it; Both my parents reviewed my report and gave helpful comments.	