



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Lupita M. Rodriguez	Project Number S1409
Project Title Do String Players Have Longer Left Fingers?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This project takes advantage of a "natural experiment" on stress and bone development. String players exert stress on the fingers of their left hands as they apply tension by compressing the strings to produce different notes. My main goal in this project is to determine whether or not if stress exerted on the left fingers when playing a stringed musical instrument can show that their fingers are longer than their right-handed fingers. Most string players, especially experienced ones, vibrate with their left fingers to make the notes played sound more intricate. Also, when playing difficult pieces, sometimes a player has to stretch their fingers widely in order to hit those certain notes. So does this increased stress, result in longer fingers of the left hand compared to the right hand in string players? How about non-string players?</p> <p>Methods/Materials My methods used in this project can be defined in four simple steps: 1.) Select 2 groups: Stringed Musicians & Control Group within the same high school age range of 13-18 years old. 2.) Measure the lengths of each participants index, middle, ring finger and pinky for both hands. 3.) Calculated the difference in length between fingers of left hand and fingers of right hand for each individual. 4.) Analyzed my data. My materials used were the following: 1.)Volunteers of approximately 50 participants in each group: Stringed and age-matched non-musicians. 2.) Metric ruler for measuring finger lengths. 3.) Calculator and computer with spreadsheet program for analyzing results.</p> <p>Results My results concluded that for string players, 78% of those observed had longer left fingers and 22% of them did not. For non-string players, 83% did not have longer left fingers and 17% of them did.</p> <p>Conclusions/Discussion My hypothesis proved to be true after analyzing my results and that the stress exerted by playing a stringed musical instrument does increase in a length of the left hand finger bones than the right.</p>	
Summary Statement My main goal in this project is to determine whether or not if stress exerted on the left fingers when playing a stringed musical instrument can result in an increase in the length of the finger bones.	
Help Received	