



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Yu Hsiang "Simon" Wang	Project Number J1025
Project Title The Fingers of Isaac Stern: Will Constant Stress Affect the Development of Phalanges?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine if violinists have longer phalanges in their left hand than their right hand compared to non-violinist. I believe violinists have longer left hand fingers due to the stress on the bones.</p> <p>Methods/Materials Methods: 6 steps: 1)Design a questionnaire 2)Define samples. 3)Select two groups: violinists and control group,each with twenty four people,divide evenly into four sub-groups: male, female, adult and young adult.(12 & up) 4)Define uncontrolled variables. 5)Conduct a personal interview and measure the index, middle, ring finger & pinky. 6)Analyze data. Materials: A specially made ruler is used. It has a moveable piece of cardboard on the ruler for easy reading and maximum accuracy.</p> <p>Results The violinist group has much longer phalanges in their left hand by as much as 0.6 cm. The non-violinists left hand four fingers are significantly shorter than the right hands' by as much as 0.9 cm. The data show no significant difference between both adults and young adults, male and female group.</p> <p>Conclusions/Discussion Conclusions: My hypothesis is correct. The violinists' left hand fingers are longer than their right hand. This might be due to the stress they put on their bones during years of practice. Next question: I would like to know if my research would help any medical study. Especially for the handicapped with two legs of different length.</p>	
Summary Statement Constant exercise and extra stress will make the finger bones grow faster and thicker.	
Help Received Mother helped type report & print pictures, father helped make the special ruler and wired violin on the board. Parents helped drive to other Southern California cities for searching valid samples from various Youth Symphony.	