



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) James J. Kim	Project Number S1312
Project Title The Effect of Unilateral Visuomotor Adaptation Training on the Untrained Limb	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this experiment was to identify whether visuomotor adaptation training, performed on one side of the body, positively affected the contralateral side. It was observed through previous research that physical unilateral training, such as lifting weights and stretching one side of the body, had a positive correlation to the performance of the untrained half of the body. If physical unilateral muscle training can strengthen the contralateral side, then unilateral visuomotor adaptation training should accordingly fortify the opposite side as well. Although the trained side may likely outperform the contralateral side, the untrained side may perform better than it would have without the contralateral training.</p> <p>Methods/Materials To test this hypothesis, subjects performed a reaching task in which they reached to visual targets on a computer screen. The visual feedback of the position of the hand was displayed as a circle icon. Subjects needed to maneuver this circle icon into the targets with the computer mouse within a certain time limit, but the visual feedback was perturbed during repeated trials to see if the untrained hand would show an improvement in performance. Therefore, the materials used for this experiment was the visual feedback computer program, one laptop computer, and one computer mouse.</p> <p>Results The subjects who trained their left hand showed an average of a 126.42% increase in performance for the untrained hand, subjects who trained their right hand showed a 98.42% increase, and the total average of both left and right training averages combined showed an increase of 112.42%. The results demonstrate the occurrence of interlimb transfer of motor learning, indicating an improvement in performance of one limb following training with the other.</p> <p>Conclusions/Discussion Because the unilateral visuomotor adaptation training did in fact fortify the opposite side, the hypothesis was confirmed. However, the speculation that the trained hand may likely outperform the untrained hand was rejected. This project was able to answer questions regarding interlimb transfer of motor learning in the brain.</p>	
Summary Statement I found that unilateral visuomotor adaptation training did in fact fortify the performance of the opposite limb.	
Help Received My father helped in creating the logistics of the experiment. He also helped to design the computer program used during testing.	