



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Nicholas Meksavanh	Project Number J1219
Project Title Virtual Reality: Fun or Harmful?	
<p style="text-align: center;">Abstract</p> <p>Objectives The purpose of this experiment is to measure the short-term effects of virtual reality on the body, specifically our biology related to heart rate and blood pressure. The goal is to find evidence on whether this new technology will have a positive or negative effect on users when we become immersed in this environment.</p> <p>Methods Two videos were presented to 22 volunteers, thrilling and calming experiences. For every other volunteer, videos shown were rotated to eliminate any order biases. Before the VR sound box headset was placed on each volunteer, their blood pressure and heart rate were measured by a wrist electronic sphygmomanometer and recorded in the journal. The 1st video was played and after each minute, heart rate and blood pressure were measured and recorded again. This is repeated for the 2nd video.</p> <p>Results It can be concluded that peoples heart rate and blood pressure rises from their baseline while watching both types of virtual reality video. Everyone in the experiment had increased heart rate while watching both virtual reality video, especially people under 18 years of age and self-identified gamers. However, heart rates were lower for people over 18 years of age than any other demographic groups. But they exhibited higher increases in blood pressure during the experience, especially among males in this group.</p> <p>Conclusions With every new consumer product there are potential harmful effects that directly or indirectly affect people. More and more households are using this new technology daily. But there is still very little research done on its effects. While new technology is fun and exciting there could be potential negative short-term and long-term effects on us if used for extended periods of time. The results from my science project provides insight into the effects of virtual reality on our biology, mainly how it affects the heart and blood pressure in a negative way. Using virtual reality for just two minutes volunteers showed signs of stress due to intense immersion, especially among females under 18, female gamers, and adult males who already have high blood pressure conditions. Our body reacts to change in our environment quickly and in virtual reality it is even quicker. Using these products may have longer term damaging effects as well if users are immersed for extended periods or repeatedly.</p>	
Summary Statement I showed that being immersed in any virtual reality environment has short-term negative affects on our heart and blood pressure.	
Help Received My aunt, Dr. Tran, explained to helped me understand heart rate and blood pressure measurements. My parents provided me with the virtual reality goggles, virtual reality headset, and sphygmomanometer.	