



# CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

<b>Name(s)</b> <b>Michael J. Vredenburg</b>	<b>Project Number</b> <b>J1715</b>
<b>Project Title</b> <b>Eye Injuries: Adolescent Perceptions and Self-Protective Behaviors Concerning Recreational Guns</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Toy replicas of real firearms and have become popular worldwide, resulting in eye injuries and blindness; yet little research has been conducted to examine factors contributing to the safe, and unsafe, use of airsoft and paintball guns, particularly among adolescent users. A primary aim of this study was to examine adolescent risk perception and measures taken to protect eyes. To evaluate actual risk, ballistics testing on airsoft guns was performed.</p> <p><b>Methods/Materials</b> Risk perception data: 104 participants were asked to participate in the study and given consent forms to have signed by their parents. The risk perception survey created for this study assessed adolescents' perceptions of the dangers of airsoft and paintball markers and their safety practices as a function of age, gender, and experience. Ballistics testing: The experimenter followed a recipe to prepare ballistics gelatin that simulated muscle tissue. Four test guns of different power levels fired ammunition of three different weights into the gel. The depth penetration of the ballistic gel was measured using a steel caliper gauge. Injury to other body tissues (eyes, skin, bone, etc.) was evaluated.</p> <p><b>Results</b> Participants of this study perceived airsoft guns as less dangerous than other types of toy guns. Many indicated that they do not wear protective eyewear, even when shooting at each other. Experience playing with these guns was associated with decreased danger perceptions. An evaluation of packaging and labeling of these products revealed that while protective eyewear is frequently included in paintball gun packaging, it was rarely included in airsoft boxes. Although adolescents perceive airsoft guns to be relatively safe, the ballistics results suggest otherwise.</p> <p><b>Conclusions/Discussion</b> The results of this study have important implications, particularly for manufacturers of airsoft guns. Although participants who play with airsoft guns are apparently aware of the need for protective gear, a significant percentage of players choose not to take steps to protect themselves.</p>	
<b>Summary Statement</b> This study evaluated the perceived and actual risks of eye injury posed to adolescent users of airsoft and paintball guns and the extent of their self-protective behavior.	
<b>Help Received</b> Michael Kalsher, Associate Professor of Psychology at Rensselaer Polytechnic Institute, helped me with statistics. Stephen Plourd, an accident reconstructionist, helped me with ballistics testing. My father, a high school science teacher, let me collect data from his students.	