



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Savannah E. Hammond	Project Number J2406
Project Title Horse Sense: Do Horses Respond to Human Emotion?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I spent my summer working with horses and learned anxiety may interfere with the ability of a horse to learn and respond to commands. This made me wonder how long it might take a horse to calm after a surprising event. I read an article that said a researcher found the heart rate of a nervous rider might influence the heart rate of a horse. I wanted to see if a handler's elevated heart rate might also influence the heart rate of the horse being led or ridden.</p> <p>Methods/Materials I performed 150 tests on over 75 horses of varying breeds, ages and genders. I used a Polar Equine Health Check Monitor to measure the heart rate of the horses. In the first experiment, I let a balloon sail off with a soft whooshing sound to raise the heart rate of the horse. The second experiment was to see if a human rider's heart rate impacts a horse. My method for this experiment was to tell the handler that an umbrella would open on the fourth pass of a set course. An umbrella was never opened. I also performed a control experiment, testing 25 horses. I tested rider/handlers and horses in the same manner without any mention of an umbrella.</p> <p>Results In the first experiment, when the horses were surprised, the majority of the horses tested took at least 20 minutes to return to their resting heart rates. In the second experiment, I found that a difference of 5 beats per minute was the greatest change in the control group, but when handlers were told an umbrella would open, 4 out of 5 horses had significantly increased heart rates. In fact, on average, the horses' heart rates increased 17 beats per minute and human heart rates increased 19 beats per minute.</p> <p>Conclusions/Discussion From the results of the first experiment, 28 of 50 horses took 20 minutes or longer to calm, which is much longer than most handlers would expect. In the second experiment, an astounding 80% of the horses' heart rates increased significantly when the heart rate of the rider/handler increased. This may be invaluable information for riders and trainers to know to help understand their horses. More tests should be performed to confirm the findings.</p>	
Summary Statement The purpose of this project was to see how long it took a horse to calm after a surprising event and to see if rider/handler heart rates could impact horse heart rate.	
Help Received My science teacher is amazing and generous with her support. Thank you to my parents and grandparents for driving me to complete 7 months of testing. Thank you to Judy Duncan for sharing her knowledge. Thank you to Dr. Walker and Dr. Subauste for their advice.	