



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Emma M. Butler	Project Number J0404
Project Title How Mental Stress Impacts the Tennis Game	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment was to answer the following question, "During a tennis match, how does your stress level affect the way you perform?"</p> <p>Methods/Materials Data from a total of 11 advanced tennis players was collected to help answer the question. Each player was required to play at least 3 matches wearing a heart rate monitor. Heart Rate was measured in beats per minute (bpm). Each participant then played his or her match as they normally would, while making a note of their heart rate every odd numbered game (i.e. when they changed sides). Throughout the match, the player's outward signs of stress were noted such as throwing his or her racquet or talking negatively to themselves. The participants also answered a short survey asking them how they feel prior to playing in a match.</p> <p>Results After looking at all 3 data collection components, results had to be drawn. All three components were charted and graphed to get a conclusion that stress positively impacted 8 of the 11 participants.</p> <p>Conclusions/Discussion The data obtained from this experiment demonstrated that a player needs to have a certain amount of stress in a match to perform at their highest level. After all the data was carefully analyzed the conclusion was drawn that a certain amount of stress is needed for a player to perform at their highest level. Too much stress (so a higher heart rate) or not enough stress (so a low heart rate) impacted a player negatively. When a player had the optimal amount of stress the player played at the highest level.</p>	
Summary Statement Three different ways to collect data (heart rate, before match survey, and outward signs of stress) were used in attempt to see how mental stress impacts the tennis game.	
Help Received Mother helped glue down the board, parents and coaches helped collect data as multiple matches were going on at once	