



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Aviya Afra</b>	<b>Project Number</b>  <b>J0401</b>
<b>Project Title</b>  <b>Investigating the Correlation between Demographics and Attitudes towards Contemporary Social Movements</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> Opinions about social movements may stem from demographic factors such as race, gender, etc. My hypothesis is that demographic factors will correlate with opinions on social movements such as Black Lives Matter and #MeToo.</p> <p><b>Methods</b> Survey Monkey was used to implement a survey composed of questions that assessed the responder s demographics and opinions about the #MeToo and Black Lives Matter movements. Demographic factors such as race, gender, socioeconomic background, age, religion, etc were measured. The degree of support for contemporary American social movements was measured. Statistical measures to test for correlation (Chi squared) and to develop a predictive model (Classification and regression tree analysis [CART]) were utilized.</p> <p><b>Results</b> 223 respondents completed the survey. Using chi squared, no correlation was found between the demographic factors assessed and opinions on the social movements. The following statistically significant correlations were identified: 1. If a respondent believes race discrimination is not occurring in the US, the respondent is more apt to be white than nonwhite (Chi squared p=0.03). 2. If a respondent believes race discrimination is not occurring in the US, the respondent is more apt to have not experienced discrimination because of their race (Chi squared p=0.01). 3. If a respondent believes race discrimination is not occurring in the US, then the respondent is more apt to believe gender discrimination is not occurring in the US (Chi squared p=0.0005). 4. If a respondent believes race discrimination is not occurring in the US, then the respondent is more apt to disapproves of the #MeToo Movement (Chi squared p=0.0001). 5. If a respondent believes gender discrimination is not occurring in the US, then the respondent is more apt to have not completed college (Chi squared p=0.03). A predictive model was created using CART, in which 90% of the respondents fit into this model [area under the receiver operator curve (AUROC)=0.9016]. The responses to three survey questions predicted the response to Do you feel racial injustice is currently occurring in the United States? This means the model is very predictive.</p> <p><b>Conclusions</b> No correlation between demographic factors and opinions about social movements were found. A Classification and Regression Tree Analysis was created. Many statistically significant correlations were identified.</p>	
<b>Summary Statement</b>  My project investigates the correlation between demographic factors and opinions on social movements such as Black Lives Matter and #MeToo.	
<b>Help Received</b>  I would like to thank the people who took the time and effort to complete my survey.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Michelle Bryant</b>	<b>Project Number</b>  <b>J0402</b>
<b>Project Title</b>  <b>Children Value Something More If They Worked for It</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> In order to determine whether children value something more if they worked for it, I studied whether children would rather keep something they earned or an identical item they received as an unearned gift, and their reasons why.</p> <p><b>Methods</b> Third and fourth grade children did exercises to earn materials to make a beaded keychain out of pipe cleaners, plastic beads and key rings with clasps. My helpers made an exact replica of each child's keychain and gave it to the subject as an unearned gift. Subjects had to surrender either the keychain they earned or the one they were given and tell me the reason.</p> <p><b>Results</b> I found a very statistically significant preference for keeping the earned keychain among all 44 test subjects (P value 0.007) and among the 20 boys (P value 0.002), but not among the 24 girls (P value 0.4). For most people who kept the earned keychain, the deciding factor was the effort involved. One third of the girls and none of the boys kept the gifted keychain because of gratitude.</p> <p><b>Conclusions</b> Children value their own work. Most children value an object they earn more than an unearned object because they value their own effort and accomplishment. When a child really wants a toy, parents should make them work for it so they value it more. That a third of girls and zero boys kept the gifted keychain out of gratitude was a surprising gender difference and suggests that a portion of girls have a prosocial, altruistic focus in prioritizing thankfulness. These results may also reflect the culture of gratitude at my school. I did not find any earned vs. given experiments like this in the literature.</p>	
<b>Summary Statement</b>  I predicted correctly that most children value something they earn more than an identical item they receive as an unearned gift.	
<b>Help Received</b>  My science teacher Debbie Culley, the four teachers who let me test their classes at SFC, my four 7th grade helpers, and my parents	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Samsara Chahine</b>	<b>Project Number</b> <b>J0403</b>
<b>Project Title</b> <b>Single-Use Plastic Straws: Taken by Habit, by Preference, or with Ignorance?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> My main objective was to trace down a general understanding of why people choose plastic straws over paper straws. What their needs/habits are, and if their decision is related to their level of environmental awareness.</p> <p><b>Methods</b> In order to gather the necessary information, I conducted an experiment using human test subjects. Participants followed a series of preliminary steps which consisted of having to choose between a paper straw (offered in six different colors) or plastic straw (same colors as paper), then sampling lemonade with the straw, then without. I had to use deception in my experiment in order to make my results as accurate as possible. So, I told my participants "How does your perception of color (colored straw) affect the taste of your lemonade?" My actual results were collected through the survey I designed, which I gave after the preliminary steps were followed. The survey was given in order to help me better understand peoples derived reason to choose a particular straw, whether it be by habit, intention, or level of knowledgeability. After analyzing the surveys, my participants were categorized into three different groups, those who were; "Somewhat Environmentally Aware", "Environmentally Aware", and "Very Environmentally Aware".</p> <p><b>Results</b> From the three environmental categories I placed my participants in, and an extended list of percentages, I realized the "Very Environmentally Aware" and "Environmentally Aware" groups had a majority choosing a plastic straw over paper straw. 64% of the 122 people I surveyed chose a plastic straw. 10% of those 122 participants chose their straw because of environmental reasons, 10% by habit, 52% because of the color of the straw. These results pertain to my objective because I now understand how many choose through habit, and that in most cases someone s level of environmental awareness doesn't affect their choice of straw.</p> <p><b>Conclusions</b> After reading in the article, "The Growing Level of Environmental Awareness", that "When people experience a damaged environment, it changes their view on the world." author of this article Steven Cohen made me realize what my results meant. Perhaps this explains that the effects a straw has on the environment isn't enough to make a majority care, perhaps the layer of trash mixed into our ocean isn't what's going to inspire our everyday people to make a change. With these results, it expands our knowledge about why people choose plastic straws, over paper straws, what could/should be done to make people care about the environment, and what group of people need to be further environmentally educated.</p>	
<b>Summary Statement</b> Having participants follow through my experiment, and filling out a survey, I discovered that different areas of knowledge and habitual experience did not affect some people's choice between a paper or a plastic straw.	
<b>Help Received</b> Overall the oral presentation of my board, written portions, brainstorm, and research were all of my doing. I had assistance from my science teacher Mr. Penkala regarding the basic criteria needed throughout the project.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Danna Coria</b>	<b>Project Number</b> <b>J0404</b>
<b>Project Title</b> <b>Can You Take the Heat?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this study is to figure out if there is a cultural difference in how much spice can be handled with the following 3 cultures: Caucasian, Hispanic, and Asian.</p> <p><b>Methods</b> Milk, Almond Milk, Banana, Xxtra Flamin Hot Cheetos, Oranges with Chilli Powder, Chips with Salsa, Atomic Wings, Tapatio Ramen Noodle Soup, 5 test subjects from the background of Asian culture, 5 test subjects from the background of Hispanic culture, 5 test subjects from the background of Caucasian culture, Plates, Napkins, Forks</p> <p><b>Results</b> My graphs here show what each of my test subjects for each culture thought of each food they tried. Their opinions were based on how spicy each food was. The rate was 0-6. 0 meaning not spicy at all and 6 meaning very spicy. I had 5 people per culture. The foods they tried were chips and salsa, Xxtra flaming hot Cheetos, Atomic Wings, Oranges with Chilli Powder, and Tapatio Ramen Noodle Soup. My test subjects also had the option to have milk and bananas to cure the spiciness. According to my data tables, the least spicy food was the Tapatio Ramen Noodle Soup and the spiciest food were the atomic wings. My hypothesis was that the Hispanic culture was gonna be the one to handle the spiciest foods because of their cultural foods and the spiciness. I did not get the results I expected because now that I look at it comparing the Hispanic bar graph and the Asian bar graph there were some major and not major differences. I was surprised with some of the data I collected because for example, the Asian culture handled the Xxtra flaming hot Cheetos and the atomic wings better than the Hispanic culture. The Caucasian culture could just not handle any of the spicy foods well. The data proves that the Asian culture was able to handle the food best because there are some differences for example when I mentioned the Xxtra flaming hot Cheetos and the atomic wings compare the Hispanic graph and the Asian graph and there is where you will find your answer.</p> <p><b>Conclusions</b> After all my research and all my testing, there is a cultural difference in how much spice can be handled. The culture to best handle spicy food was the Asian culture. I know I am correct with my final answer because for example most of the Asian culture put a 0 for how spicy the oranges with chilli powder was. The Hispanics put an average of 0 and 6. The Caucasian culture put an average of 2. Also for most of them, the Asians put 2 or 4 while the other cultures put 4 or 6. I got my results basically I tested by starting with least spicy foods and moving on to the extremely spicy ones. I also had the test subjects have milk or</p>	
<b>Summary Statement</b> In my project I am trying to figure out if there is a cultural difference in how much spice can be handled between the cultures hispanic, caucasian, and asian.	
<b>Help Received</b> I had my teacher Elizabeth Kayee Conrad help with the foods and cultures I could test.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Jai Das</b>	<b>Project Number</b>  <b>J0405</b>
<b>Project Title</b>  <b>The Color of Aggression: Does Yellow-Green Lighting Cause More Aggressive Responses in Humans than Blue Lighting?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this experiment was to find if color affects aggression in people.</p> <p><b>Methods</b> I decided to test this question by giving 30 adults (13 men, 17 women) a survey while under a blue light or under a yellow-green light. Survey subjects had to choose from a set of responses that varied in aggression level for each scenario. The subjects took the survey in a dark room lit by one of the two colors of light. From my google scholar research, I found that yellow-green light makes people more aggressive than blue light, which can be calming. My hypothesis was that the yellow-green light would cause people to choose more aggressive answers to the scenarios than the people taking the survey in the blue light. For each scenario, subjects had to choose a response from 4 different categories of aggression (listed from most to least aggressive): a physically aggressive response, a verbally aggressive response, a coping response (going to an authority figure for help), or withdrawal from the situation. I totaled the number of times each person chose answers from each category to get a score for each category for each person. I calculated the means for the scores for each response category under each light color. I used 95% confidence intervals and t-test to find out if there was a real difference between blue light and yellow-green light responses.</p> <p><b>Results</b> I found that there was no significant difference between the people in the yellow-green light and the people in the blue light for any of levels of aggression or categories.</p> <p><b>Conclusions</b> In conclusion, my results did not support my hypothesis. I did not find a difference in aggression between people taking the survey in the blue light than the people taking the survey in the yellow-green light.</p>	
<b>Summary Statement</b>  Based on surveys taken in each type of lighting, I found no significant difference in aggressiveness between subjects in yellow-green light environments and subjects in blue light environments.	
<b>Help Received</b>  My parents helped me get test subjects for my study. My father taught me how confidence intervals and t-tests work and helped me use statistics software to calculate them.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Sydney Hecht</b>	<b>Project Number</b>  <b>J0406</b>
<b>Project Title</b>  <b>Testing the Impact of Gender on a Variation of the Prisoner's Dilemma</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this project was to determine whether male or female individual students are more cooperative and if gender pairing made a difference. Using the Prisoner's Dilemma as the foundation for my experiment, I created a game with a reward to try to discover which gender is superior in terms of cooperation. I hypothesized that females would ultimately be more cooperative than males when paired with the same gender. When paired with the opposite gender, I believed that males would become more cooperative.</p> <p><b>Methods</b> I surveyed a total of 121 students in grades fifth through eighth. I distributed two surveys to each participant, for a total of 242 responses. Each survey explained a game modeled after the classic Prisoner's Dilemma. I explained that they were wagering points to win a mechanical pencil. The participants could choose to either take from or share points with someone unknown at random of the same gender. The second scenario asked them to make the same decision while paired with an individual of the opposite gender.</p> <p><b>Results</b> There was an average of 30 students in each grade, for a total of 121 participants in grades fifth through eighth. The results I obtained from the subjects showed that females cooperated 10% more often than males when faced with the decision to share or take from each other. However, when asked to make the same decision when paired with an individual of the opposite gender, males shared 10% more frequently than females. In both situations, 64% of all participants chose to "take" the points, and 36% of subjects chose to share the points. At each grade level, I found that my hypothesis was supported by the statistical differences of each gender's decisions. Although my hypothesis was consistently supported, I was surprised by the large percentage of participants who chose to take the points.</p> <p><b>Conclusions</b> Overall, my hypothesis that females would be more cooperative with each other and that males would be more cooperative when paired with females by my findings. The Prisoner's Dilemma and its variations can be utilized in any situation where cooperation is necessary, such as in education and in the workplace. By realizing the key to collaboration is trust, knowing the level of cooperativeness one's peers are likely to possess can lead to proactiveness, and eventually, success.</p>	
<b>Summary Statement</b>  Using the Prisoner's Dilemma as the foundation for my experiment, I created a game with a reward to try to discover which gender is more cooperative.	
<b>Help Received</b>  I created the surveys, performed the experiment, and analyzed the results myself. My science teacher allowed me to test during class and guided me throughout the project.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Safaa Hussain</b>	<b>Project Number</b> <b>J0407</b>
<b>Project Title</b> <b>Reward, Praise, and Criticism: Tangible vs. Intangible Reward Expectancy: What Works Best?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this study was to continue studying the effects of varying stimuli on the performance of sixth graders and adults by discovering the impacts of tangible vs. intangible rewards, given either before or after a task.</p> <p><b>Methods</b> Informed consent was obtained from 40 randomly selected participants, 20 adults and 20 sixth graders, divided equally between males and females, who performed the board game Scramble. 10 from each age group performed this test with tangible (physical) reward, while the other half performed the same test with an intangible (recognition) reward. Each participant executed the task 3 times, once with no reward, once with reward beforehand, and finally with reward given after the task. When finished, each participant was given 3 survey questions on the perceived effectiveness of the stimuli.</p> <p><b>Results</b> I studied the scores from 40 participants of two age groups, adults and sixth graders. Fifty percent of sixth graders, the majority, performed best with tangible reward given after the task, while sixty percent of adults performed best with reward given before the task, without regard to the type of reward. Male and female participants varied in their most effective stimuli. For the survey questions, 50%, of sixth graders replied that reward given afterwards was most motivating for them, while 35%, replied that reward beforehand was most effective.</p> <p><b>Conclusions</b> Based on my findings from this year s project, the effects of tangible (physical) vs. intangible (recognition) reward on performance do change with age, partially supporting my hypothesis. The timing of when reward is given (before/after) does affect performance on a task. My previous year s project attempted to discover the effects of praise and criticism on performance of sixth graders and adults. Comparing the results from this year s project and my previous year s, I found that overall, taking into account reward, praise, and criticism, sixth graders still perform best with verbal praise, while adults do best with criticism.</p>	
<b>Summary Statement</b> I found that the impacts of tangible and intangible reward stimuli, as well as the timing of when reward is given, do change with age and gender.	
<b>Help Received</b> I designed and performed the experiment on my own, with the exception of my science teacher giving guidance on how to display raw data in graphs.	





# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Robert Ikeda</b>	<b>Project Number</b> <b>J0408</b>
<b>Project Title</b> <b>Does Parental Guidance Affect Smartphone Addiction?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this project is to determine whether or not parental limits affect middle school students smartphone addiction. My hypothesis is that the more limits parents give, the less addiction student would have because it is their parents who provide them with their phones, and the students develop their phone use habits under the influence of their parents.</p> <p><b>Methods</b> To conduct my experiment, I made a questionnaire on google forms. The first test was the Smartphone Addiction Test based on the Internet Addiction Diagnostic Questionnaire (IADQ) developed by Dr. Kimberly Young. The second test was the Parental Limits Test that I developed and is based on tips and advice from experts on what parents should do with their children s smartphone use. A total of 490 students from Sequoia Middle School took the questionnaire. I reviewed the data and analyzed the statistics using Excel. I also separated the students into the addicted and the non-addicted groups based on IADQ to find out if there is any statistically significant difference between each group in both tests.</p> <p><b>Results</b> There was no correlation between the total of the Parental Limits Test and the Smartphone Addiction Test (<math>r = 0.19</math>). There was a positive correlation between scores indicating addiction on the Addiction Test and the frequency of smartphone use by students alone in their own rooms (<math>r = 0.35</math>). Another correlation was between the total of scores indicating addiction on the Addiction Test and the time of smartphone usage per day (<math>r = 0.36</math>). I divided the students into addicted and the non-addicted groups and there were 75 out of 440 students that were in the addicted group. There was a statistically significant difference in the mean of the Parental Limits test between the addicted group and the non-addicted group. The mean was higher (higher score means less parental control) in the addicted group (25.8 out of 40) than non-addicted group (24.07) with a P value of 0.04. My data also showed that the female students were more addicted than the male students. The mean of female students Addiction Test score (23.44 out of 40) was higher than male students (21.44) with a P value of 0.0004.</p> <p><b>Conclusions</b> My hypothesis the more limits that parents give, the less addiction student would have was partially supported. There was not a correlation between the total scores of the two tests, but the data showed that the frequency of usage by students alone in their rooms and the amount of smartphone use each day were risk factors for addiction.</p>	
<b>Summary Statement</b> I found that the frequency of smartphone use by students alone in their rooms and the amount of smartphone use each day were risk factors for smartphone addiction.	
<b>Help Received</b> Mrs. McCracken gave me general guidance. My mother helped with the statistical analyses.	





# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Paloma Kasad; Emilio Vizcaino</b>	<b>Project Number</b> <b>J0409</b>
<b>Project Title</b> <b>Technology's Blue Light and Its Effect on Our Sleep</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this project is to find out what will help people all over the world get better and improved sleep. 95% of US citizens use some sort of technology before bed, and studies have shown that exposure to blue light or technology causes a drop in melatonin. Melatonin is the chemical in your body that helps the body fall asleep, so if a person is exposed to a blue light emitting screen for 2 hours before bed, then they will wake up feeling 30% more tired than normal and they will feel groggy in the morning because when you go on technology your melatonin levels drop. The variables for this project were exposure to light and no exposure to light. The variable that was manipulated in these tests was the light levels from technology, 5 nights of no exposure and 5 nights of maximum exposure. The way the variables were measured was that all the subjects filled out a survey about how they slept. After multiple tests, over a span of ten days testing 2 hours before bed, it was found that the most prominent difference between no exposure and exposure to this light is the level of grogginess. As a result, it was found that most subjects found it easier to fall asleep at night when there was no light exposure in the room, but it was a slight difference. In conclusion, it was found that there is a subtle difference in spending time on a screen and not spending time on a screen. The way this test could have been done more exact would have been if the subjects had all gone to bed at the same time, all were on the same mattresses, and in a lab where all the light levels can be controlled.</p> <p><b>Methods</b></p> <p><b>Materials</b></p> <ul style="list-style-type: none"><li>- 4 0 Blue Light Emission Lights</li><li>- 4 handheld devices (Phone/Tablet)</li><li>- 4 earbuds/Headphones</li><li>- Movies/Videos/Audio Books/Books/Podcasts/Music (Subjects Choice)</li><li>- 4 Alarms</li></ul> <p><b>Steps</b></p> <ul style="list-style-type: none"><li>- Select 4 people to test.</li><li>- Confirm that the subjects rooms have no light pollution. (night lights, streetlights coming in through the windows, alarm clock lights, and indicator lights)</li><li>- At 7:30 pm subjects will shut off all the lights and lay in bed watching something on the handheld screen.</li><li>- Watch until 9:30, then go straight to sleep.</li></ul>	
<b>Summary Statement</b> After testing multiple subjects and the effect that blue light had on their sleep, we found that the subjects slept 17% better when they were not exposed to technology within two hours of going to sleep.	
<b>Help Received</b> At the end of this project, a big appreciation is shown toward Dr. Anil Sethi who provided as a professional help and mentor. Dr. Sethi helped this project face onto the correct tracks and head for success. Another grand acknowledgement to Patricia Kasad who provided guidance and mentoring as	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Arwen Louie</b>	<b>Project Number</b>  <b>J0410</b>
<b>Project Title</b>  <b>The Color of Personalities: Introversion, Extroversion, and the Surprising Effect of Gender on Artistic Expression</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> This project explores how personality, specifically introversion versus extroversion, affects a person's artistic expression. I hypothesized introverts would 1) utilize lighter, duller, more muted colors 2) color the entire coloring page and 3) be more detail oriented, while extroverts would 1) utilize bolder, brighter colors 2) not color the entire coloring page and 3) be less detail oriented. This project was prompted by my interest in art and fascination with the Myers-Briggs Personality Categorizations.</p> <p><b>Methods</b> The materials I used in this study were Myers-Briggs style personality tests, colored pencils, coloring pages, demographic surveys, and participant rubrics. My procedure included 92 participants who each completed a Myers-Briggs style personality test and short demographic survey and colored a presented picture. I analyzed each participant's completed image with the rubric, which measured amount of space covered, color intensity, and detail, then compared and correlated results from introverts to extroverts.</p> <p><b>Results</b> My hypothesis was partially correct. While introverts color lighter and cover more space, extrovert images are more detailed, which I did not expect. Though my hypothesis was partially validated, variance between introverts and extroverts were small. Because of this, I expanded my study to investigate other factors including gender and the three other Myers-Briggs Personality categories. I surprisingly found that gender plays the most significant role. Not only are introverted males significantly less detailed than everybody else, but all males also color lighter and cover much less space than females.</p> <p><b>Conclusions</b> While introversion and extroversion affect artistic expression, the data indicates that other factors play a larger role. The other three categories from Myers Briggs yielded greater impact than introversion and extroversion and gender turned out to be the biggest factor.</p>	
<b>Summary Statement</b>  I found that while Introversion and Extroversion affect artistic expression, a participant's gender plays a much larger role.	
<b>Help Received</b>  I devised the study, including creating the surveys and rubric and selecting the personality test site and coloring page. My teacher and parents assisted with identifying subjects to approach to participate in the experiment.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Gianna Manfredo</b>	<b>Project Number</b>  <b>J0411</b>
<b>Project Title</b>  <b>According to the Social Learning Theory, At What Age Can Parents Influence a Child's Political Views?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this project is to determine at what age do children get politically influenced by their parents. Children at young ages are starting to have strong political beliefs, so at what age do children develop these same political values as their parents? According to Social Learning Theories, children observe the people around them as influential models. I tested to see if children of various ages from age 4 to age 18 would develop any political viewpoints from their parents. Statistics helped show that 67% of children starting as early as age 7 will begin to be influenced by their parent's political views.</p> <p><b>Methods</b> Researched how social learning theories are understood and how children can be influenced by their parents according to Albert Bandura. Conducted 120 trials to determine one's political viewpoints. Asked Kindergarten students through 6th grade along with high school students and also their parents. Collected and organized all of the data into several different categories according to age, parent, gender, political party, and viewpoints on current President. Graphed and charted all the data using flow charts, pie charts, bar graphs and frequency tables. Checked for correlation between children and parents and also between different age groups.</p> <p><b>Results</b> It was found that 67% of Elementary students had the same political views as their parents starting as early as age 7. Also found that 60% of High School students had the same political viewpoints as their parents. The correlation between the two studies was very strong, with a correlation of .994377. A combination of all subjects studied showed that 64% of children and teens will have the same political viewpoints as their parents.</p> <p><b>Conclusions</b> I found that parents start to influence their child's political views 67% of the time as early as age 7. Parents are a big factor when influencing their kids' beliefs. According to a Gallop survey 70% of teens say their social and political ideology is about the same as their parents. I found that my project was very similar showing 67% perceived the same political views as their parents starting at age 7.</p>	
<b>Summary Statement</b>  The purpose of my project is to determine at what age do children get politically influenced by their parents.	
<b>Help Received</b>  Mr. Gulbronsen: Mathematics teacher	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Aarya Mukherjee</b>	<b>Project Number</b> <b>J0412</b>
<b>Project Title</b> <b>Puff the Vaping Dragon: A Study of Knowledge and Interest in E-cigarettes among Middle School Students</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this project is to determine the rate of use, knowledge of different types, health risks and interest in the future use of E-cigarettes among suburban middle school students and compare this knowledge to that of their parents.</p> <p><b>Methods</b> I built the survey based on my research of E-cigarettes. I obtained consent from the parents of 40 7th/8th grade students and 17 parent participants. I administered the survey to all the students at the same time in a classroom. The parent participants answered the survey at home. ALL THE ANSWERS WERE COLLECTED ANONYMOUSLY. Data was analyzed using Microsoft Excel.</p> <p><b>Results</b> 0% of 7/8th-grade students reported use of E-cigarettes compared to 6% of parents. 75% of students recognized both Juul and Vapepen whereas 65% of parents knew of Juul and 35% of Vapepen. 93% of students knew of Juul's nicotine content compared to 71% of the parents. 93% of students vs 100% of parents chose "gateway to other recreational agents" as a short term health risk with E-cigarette use. 63% of students vs 100% of parents selected addiction as a long term health risk with E-cigarettes. 75% of students indicated a desire to try E-cigarettes in the future despite recognizing possible health risks. Relieve stress and peer pressure were the most common reasons cited for wanting to try E-cigarettes. Grocery store at 55% and friend/acquaintance at 48% were the most frequent sources cited by students to obtain E-cigarettes. Only 18% of parents indicated interest in learning about E-cigarettes compared to 53% of students. Students answered internet and friends as most common resources for learning about E-cigarettes.</p> <p><b>Conclusions</b> This survey revealed that the majority of 7th/8th students indicated a desire to try E-cigarettes in the future. Students were more interested in learning about E-cigarettes than their parents. Overall, students were more knowledgeable about different types of E-cigarettes and nicotine content than their parents. On the other hand, parents cited more health risks with E-cigarette use. Student's knowledge of possible health risks with E-cigarettes did not discourage them from wanting try them. Therefore, these students may be at risk for using E-cigarettes in the future. Educational campaigns may need to be applied to decrease E-cigarette use among adolescents.</p>	
<b>Summary Statement</b> This study revealed a high desire to try E-cigarettes among middle school students despite their knowledge of the possible health risks associated with use.	
<b>Help Received</b> The survey used in this project was designed by me based on background research. Dr. Gideon St. Helon, a researcher at UCSF reviewed the survey and made some recommendations.	



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2019 PROJECT SUMMARY**

<b>Name(s)</b> <b>Eleanor Mullen</b>	<b>Project Number</b> <b>J0413</b>
<b>Project Title</b> <b>Stop, You're on Camera! The Effects of Emotional and Consequential Messaging on Driving Behaviors</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this project is to measure whether drivers' behavior changes when presented with emotional or consequential messages related to their driving habits.</p> <p><b>Methods</b> Stopwatch, 4 emotional message signs, 4 consequential message signs, 4 faux security cameras. Measured stopping behavior at a 4-way stop and then re-measured after hanging the emotional or consequential signs/cameras.</p> <p><b>Results</b> Vehicle intersection stops were recorded and organized into four categories; full, rolling, no (stops), and forced (when the driver was forced to stop because of a car or pedestrian). For the control group, stopping behavior was recorded using standard stop signs. Next, family-oriented, emotionally driven signs reading <i>Stop Like Your Children Cross Here</i> were posted. For the final data set, consequence oriented signs with the message <i>Traffic Laws Are Photo Enforced</i> and fake security cameras were posted.</p> <p><b>Conclusions</b> A total of 560 cars were monitored for this experiment. Forced stops, which skewed the data, were later extracted from the data set because it is impossible to know how they would have acted without an obstacle. The hypothesis was that people would come to a complete stop more often when the camera sign was hung. Indeed, only 10% of cars stopped fully with no messaging, 35% stopped with emotional messaging and 45% stopped when the consequential sign was used.</p>	
<b>Summary Statement</b> Based on my observations, drivers are more likely to obey traffic laws (stopping at stop signs) when confronted with potential consequences.	
<b>Help Received</b> I performed all observations by myself. A parent sat with me to make sure we concurred on the action and helped to order the signs.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Darius Olayiwola</b>	<b>Project Number</b> <b>J0414</b>
<b>Project Title</b> <b>Is Gaming Good or Bad?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> In this study, I wanted to determine the effect of intense video gaming on school-aged students, by understanding the impact of the popular game, Fortnite, on students' academic performance, reflexes, pain awareness and reaction time to alarming sounds. A recent survey found that 35% of high school and college gamers admitted to missing school to play Fortnite, and on average, over 30% play at least 6-10 hours per week. The inspiration for this project came from hearing about the horrible mass shooting at a gaming convention in Jacksonville, FL in August 2018. Many gamers affected were not aware of their surroundings and did not realize the threat of gunshots immediately. Parents and children often disagree about the impact of video games on children, so I wanted to better understand the true effect. My hypothesis was that Fortnite would negatively impact academic performance, reflexes, pain awareness and reaction time.</p> <p><b>Methods</b> To test the impact of Fortnite, I invited a few students who play Fortnite regularly to play the game with me, without them initially knowing that it was a study. I assessed different items before, during and after they played Fortnite. To test academic performance, I gave each student a grade-appropriate one-minute math test before and after they played the game and looked at test completion and accuracy. For reflex testing, I threw a lightweight rubber ball to them at random times before and while they played Fortnite. I also tested pain awareness before and during play by poking the student lightly with a toothpick and having them call out every time they felt a poke. Finally, to test reaction time, I played a loud, alarming sound, such as screaming, yelling or sirens on a loudspeaker before and during play, timing how long it took for them to react to the noise. I recorded all of the findings for each participant on a data collection tool that I created. Then, I entered all of the data into an excel spreadsheet in a de-identified format.</p> <p><b>Results</b> Eight students participated in the study, ranging from ages 8-16 years old, 3rd grade - 11th grade. There were 6 boys and 2 girls in total - 4 of them played Fortnite at least 1-2 times a week, 1 played 3-4 times a week, and 3 played more than 5 times a week. Averages were calculated for each category. On average, subjects completed 44% of math facts before and 52.5% after playing Fortnite. They got 90% of completed math facts correct before playing but only 72% correct after. For reflexes, the mean number of ball catches before playing was 2.8 and while playing was 2. On average, subjects felt 9.5 out of 10 toothpicks before and 6.9 while playing. The mean reaction time to alarming sounds 3.1 seconds before playing and 16.3 seconds while playing.</p>	
<b>Summary Statement</b> In this experimental study of school-aged children, I found that the popular intense video game, Fortnite, negatively affects students' academic performance, reflexes, pain awareness and reaction time.	
<b>Help Received</b> I designed the study and data collection tool myself and got some advice from my science teacher and parents on better ways to test the different measures. My science teacher also suggested ways to analyze the data.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Rinoa Oliver</b>	<b>Project Number</b> <b>J0415</b>
<b>Project Title</b> <b>Factors Affecting the California Science and Engineering Fair Results</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this project is to investigate how income, population, grade and school history impact the performance of a project at the California State Science and Engineering Fair. The hypothesis was that winning projects are more likely to come from cities with greater median income and populations as well as be of a higher grade level than other projects. Winning projects are also more likely to come from a school that consistently performs well in the science fair.</p> <p><b>Methods</b> 1990 to 2018 data was retrieved from the CSEF website using BeautifulSoup for Python. The median household income, population, longitude and latitude were found for each city. Three one-sided Welch t-tests were performed comparing the median city household income, city population and grade of winning projects to those of other projects in a statistical package. Graphs were made comparing income, grade, population for the projects as well as see if there is a correlation with geographic location. Finally, a statistical package was used to create logistic regression models to predict the top four projects from 8 senior continuous categories. The data from 1990 was used to train the models and the data from 2018 was used to test the models.</p> <p><b>Results</b> Since the p-value for all three t-tests was less than 0.001, the alternate hypotheses that the median city household income, city population and grade level is higher for winners than other projects were accepted. The average city median income of all projects is higher today than in 1990 and there is more of a correlation with these factors and winning than ever before. Schools from an area with higher median income sent on average more projects than schools from an area with a lower median income. Many of the projects were from cities on the coast of California. Some categories were more spread out than others; computer science projects were almost entirely from the coast unlike botany. Some categories such as zoology and botany are losing popularity, while other categories such as biochemistry and computer science are gaining popularity. The logistic regression models predicted 6 winners in 5 categories using only the history of a school in that category.</p> <p><b>Conclusions</b> The data shows that there seems to be some inequality in the science fair. Winning projects were more likely to be from cities with higher median income and populations and be by students in a higher grade level than other projects. The logistic regression models showed that school history also helps determine a winner,</p>	
<b>Summary Statement</b> Higher city median income, city population, and grade level correlate to projects winning in the CSEF.	
<b>Help Received</b> Dr. Jane Zones of UCSF for advising, Professor Christopher Gould of CSEF for Santa Cruz County Data, Monica Hernandez from Kirby for guidance.	





# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Eduardo Pupko Ginsberg</b>	<b>Project Number</b> <b>J0416</b>
<b>Project Title</b> <b>All for One, or One for All?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of my experiment was to see which government style should be implemented in the world today. I did this because there are many problems in the world today, and what better way to see these issues than to do it in real life. The way I tested it out was, 24 people were split up into groups of 3, two from each grade (6-9) Each group either had a dictator or a Democratic voting system, and their goal was to build the tallest towers in the given time and with the given materials.</p> <p><b>Methods</b> I made my own project, but part of the idea was from the scouts (KEN) in San Diego. We were given a few materials and given the task to make the tallest one. The thing that was changed was the political aspect, and the material amounts given.</p> <p><b>Results</b> The results of my project were that the democracy style groups built the tallest towers, compared to the Dictatorships style groups.</p> <p><b>Conclusions</b> My conclusion is that the governments in the world should be democratic because it is the best way to advance your country, and to develop new techniques for everyday life.</p>	
<b>Summary Statement</b> Is it true that a Democratic government is overall better than a Dictatorship? Come find out!	
<b>Help Received</b> My mom who helped me out with the poster, My siblings who double checked my writing, and a couple of students helped me out with the cleanup.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Adriana Quezada</b>	<b>Project Number</b> <b>J0417</b>
<b>Project Title</b> <b>The Science of Stuttering</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> This science project is all about stuttering, a speech impediment in which sounds or words in speech are repeated unintentionally. As a stutterer myself, I wanted to raise awareness and inform people about this disability that I have, all through a science project. My hypothesis was that if the average reading speed of thirteen girls is faster than that of thirteen boys, then boys are more likely to experience and develop stuttering at an early age because of their potentially slower reading speeds. I predicted that the boys would be more prone to doing this, and that this could probably be linked to stuttering.</p> <p><b>Methods</b> Thirteen girls and thirteen boys were used for this project, with twenty-six trials in total. These test subjects were all children, ranging from eight to thirteen years old. I timed the test subjects separately while they read a selected passage from Harry Potter and the Sorcerer's Stone by J.K. Rowling out loud. During the testing process, I made some observations, like stumbles or guesses on the pronunciation of some words. After timing them, I found out the average times of the group of girls and the group of boys.</p> <p><b>Results</b> These were how the results turned out: Eight girls read in under one minute, four girls read in over one minute, and one girl read in over two minutes. Six boys read in under one minute and seven boys read in over one minute. The girls got an average time of 64.8 seconds. The boys averaged up to 65 seconds.</p> <p><b>Conclusions</b> Because of the small time difference, it was not enough to draw a strong conclusion. After doing later research, I found out that a reading test is not a diagnostic test for stuttering. A person can have reading disabilities or difficulty reading, but it is not enough to prove if they will experience stuttering. Therefore, my hypothesis is neither correct nor incorrect. With further research and results, there could be a set conclusion to my hypothesis.</p>	
<b>Summary Statement</b> My project is about stuttering, a rare speech impediment, and how it can be developed and controlled.	
<b>Help Received</b> Mrs. Gena Heins, Jessy and Jennifer Quezada	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Ayla Richland</b>	<b>Project Number</b> <b>J0418</b>
<b>Project Title</b> <b>A Catchy Bug</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this experiment is to determine if side of brain dominance effects how often one experiences earworms.</p> <p><b>Methods</b> Forty-six middle school students were asked to complete the "Involuntary Musical Imagery Scale (IMIS) questionnaire, developed by G. A., Floridou, V.J. Williamson, L., Stewart, and Müllensiefen from Goldsmiths University (<a href="https://www.gold.ac.uk/media/documents-by-section/departments/psychology/IMIS-pen-&amp;-paper-version-&amp;-scoring-info.pdf">https://www.gold.ac.uk/media/documents-by-section/departments/psychology/IMIS-pen-&amp;-paper-version-&amp;-scoring-info.pdf</a>). They then completed an online brain dominance test developed by Eterna, a company specializing in biofeedback technologies (<a href="http://www.ipn.at/ipn.asp?BHX3325185944214006">http://www.ipn.at/ipn.asp?BHX3325185944214006</a>). The results of both assessments were compared to determine if there was any correlation between the degree of an individual's brain dominance and the frequency in which they experienced earworms.</p> <p><b>Results</b> Scores from the IMIS assessment (earworm susceptibility ranges from 6 (highest susceptibility) to 0 (lowest susceptibility) among right brain dominant individuals: 17.6% scored a 6, 70.5% scored 5 or more, 94% scored 4 or more, and 100% scored 3 or more. Among left brain dominant individuals: 14.8% scored a 6, 37% scored 5 or more, 55.5% scored 4 or more, 77.7% scored 3 or more. and 22.2% scored less than 3. Among individuals without a dominant side of the brain: 50% scored a 5 and 100% scored a 4 or more. A scatter plot diagram of the collected data showed that right-brain dominant subjects consistently scored at least a 3 on the earworm susceptibility score.</p> <p><b>Conclusions</b> The data showed that if one is right-brain dominant, then earworms are more likely to occur. Conversely, if an individual is left-brain dominant, they don t experience earworms nearly as consistently.</p>	
<b>Summary Statement</b> My experiment proved that there is a correlation between brain hemispheric dominance and earworm frequency.	
<b>Help Received</b> My mom helped me edit and type my report and design my board. Dr. Jakubowski provided me a link to an earworm questionnaire to use for my experiment. Mr Hartung, my science teacher, helped me with my documents and answered my numerous questions.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Emily Ritter</b>	<b>Project Number</b> <b>J0419</b>
<b>Project Title</b> <b>Give and Take</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> How do people behave differently when they are being watched or not? The purpose of this project is to see whether people's behaviors change when they're being watched or not.</p> <p><b>Methods</b> Materials-Bowl,objects for bowl, place with lots of people, instructions for give and take Procedures Find a busy place, Set up bowl, Make observations from peering out a window/from afar, repeat steps 1-3 standing by bowl and say the instructions</p> <p><b>Results</b> Results- When I was watching from afar 58% just took an item from the bowl and 30% actually did the give-and-take and only 12% gave an item to the bowl. When I was watching from afar in the beginning I was not recording the results so I could not make as much as a detailed graph as I could when I was close to my project explaining the instructions. When I tested the project at school during lunch people were putting trash and taking what they wanted. Also when I tested the project on a different grade at lunch some people knew about the project and told others so it changed my data. When I stood by my project 2.3% of people just gave, 0% of people just took, 36.4% of people made a fair trade, 36.4% of people made an unfair trade and 25% of people gave something of a greater value during the project kids were thinking they would get their items back instead of actually giving it to trade something. I tested my project in three different places such as the Museum of Discovery in the Capitola Mall at Good Shepherd Catholic School and at Elaine s Dance Studio. When I tested at Good Shepherd more people did the project then then at the Museum of Discovery and Elaine's Dance Studio. Some trades were unfair for example somebody gave a bottle cap and took a dollar bill.</p> <p><b>Conclusions</b> Conclusion Yes! My hypothesis was correct people behave differently when there being watched. My project is important because people want to know if others do the right thing when they re not being watched. My project is also important because if people don t act the same when others aren t around there will be a big problem with theft, dishonesty and no generosity towards others. If I had unlimited time and resources I would of had a better hiding spot to watch from afar, also I would record all the trades.</p>	
<b>Summary Statement</b> My project is all about finding out peoples different reactions when they feel like their being watched opposed to feeling like their not being watched.	
<b>Help Received</b> The people who helped me on my project is my parents Anna and Barney Ritter,my science teacher Blair Gonzalez, and my sisters Julie And Hailey Ritter	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Ainsley Savant</b>	<b>Project Number</b> <b>J0420</b>
<b>Project Title</b> <b>Vigor and Verts: Are Introverts or Extroverts Healthier?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> My project is about introverts and extroverts! I wanted to know if introverts or extroverts from different ages and genders were healthier. ? My hypothesis was that extroverts were going to be healthier overall. This is because they are more likely outside playing and being active and social. Introverts are more likely inside and being less active. ? I gave people age ranging from 6 years old all the way to 66 years old surveys that would determine if they were an introvert or an extrovert. Once I figured out if they were an introvert or an extrovert, I had a second survey that would determine how healthy they are. I put each test subject into different categories. I averaged all the scores from the second survey and compared and analyzed the data. I compared against gender and age. I also crossed the introvert group with the extrovert group. For example: Female Introvert vs. Female Extrovert. ? My main conclusion was that introverts overall had healthier habits. The results included that if you were an Extroverted Adult, then you were more likely to be very healthy versus being an Introverted Adult. On the flip side, Introverted Children (children were the largest sample in my study) were the healthier group when compared to Extroverted Children. Also, Female Introverts were healthier than Female Extroverts and interestingly, Male Extroverts were healthier than Male Introverts.?</p> <p><b>Methods</b> Materials? A test that determines if the test subject is an introvert or an extrovert? A test that determines how healthy the test subject is?  Pencil? 25 Introverts (Split Up Into):? 14 Female Introvert, 11 Male Introverts, 9 Adult Introverts, 16 Children Introverts, ? 41 Extroverts (Split Up Into): ? 24 Female Extroverts, 17 Male Extroverts, 15 Adult Extroverts, 26 Children Extroverts</p> <p><b>Results</b> Throughout the project, I found that Extroverted adults were healthier than Introverted adults. On the flip side, introverted children were healthier when compared to extroverted children. Due to the sample containing more children than adults overall, the introverted group as a whole was healthier.</p>	
<b>Summary Statement</b> My project compared introverts and extroverts and which group had healthier habits.	
<b>Help Received</b> I received help from my teacher and mentor, Gena Heins. She guided me on how to create a successful science project.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Audrey Sherf</b>	<b>Project Number</b>  <b>J0421</b>
<b>Project Title</b>  <b>Effects of Text Modifications on Reading Fluency Levels of Dyslexic Students</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> This experiment was designed to see if modifications to text would help to increase the reading fluency levels of students with dyslexia or identified reading disabilities. The specific modifications tested in separate passages were text size, font, paper color and finally, a combination of all modifications applied to one passage. Fluency performance was compared to a control passage printed on white paper, in Times New Roman font, in text size 12.</p> <p><b>Methods</b> Participants were asked to read five passages. Each passage was timed for one minute. Mistakes were marked by the assessor. Number of words read were marked by assessor. The first passage was a control passage that was printed on white paper, in Times New Roman font, text size 12. Passage 2 was modified and printed in Comic Sans. Passage 3 was modified and printed in text size 16. Passage 4 was printed on blue paper. Passage 5 was modified and printed on blue paper, in text size 16, with Comic Sans font. I created my own testing booklets and assessment sheets for reading levels kindergarten-5th grade. Each testing booklet contained fluency reading passages that were modified in regards to font, text size, and paper color.</p> <p><b>Results</b> When testing modified passages against a control passage, fluency increased in both the passage with increased font size and the passage that contained all modifications combined. The average reading rate for the control was 73 words per minute. The average accuracy rate was 93%. The reading rate increased to 75 words per minute for the passage with larger font with a 94% accuracy rate. The passage with all modifications had an average reading rate of 79 words per minute and an accuracy rate of 93%.</p> <p><b>Conclusions</b> Larger font size appears to have a positive effect on reading fluency. Students' fluency levels increased when reading modified texts. This information could be used to help people with dyslexia read more fluently. I want to work on creating a tool that can be applied to online texts that allows readers to easily modify the text being read.</p>	
<b>Summary Statement</b>  I tested to see if reading fluency levels of people with dyslexia increased when reading texts that had modified in various ways.	
<b>Help Received</b>  I designed the experiment myself with support from my mother regarding reading levels. Two special education teachers used my materials to assess their students.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Eden Stambaugh</b>	<b>Project Number</b> <b>J0422</b>
<b>Project Title</b> <b>Developing Empathy in Adolescents</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> I am curious to use art as a way to develop empathy in adolescents. I am curious if the mode of delivery of this experiment (animation) can translate to higher levels of empathy for concepts and issues that are 'misunderstood'.</p> <p><b>Methods</b> Used acetate, ink, and acrylic paints to simulate a parallax scrolling background. Used Adobe Photoshop, Adobe Premier, and Lightroom to direct and produce animated short film. Used Chromebooks and Google Forms to administer tests to human subjects.</p> <p><b>Conclusions</b> One of the most pressing problems of humanity is misunderstanding. The ability to process conflict with an empathetic response is a behavioral skill that has great social and moral implications. Quantified/qualified results show that animation can be used in many applications to actuate and develop empathy and tolerance in adolescents.</p>	
<b>Summary Statement</b> The use of Human Centered Design principles - specifically animation - can increase empathetic responses in early adolescents.	
<b>Help Received</b> I conducted an oral interview with author/illustrator/activist Janell Cannon. I was mentored by filmmaker Anthony Parisi in the use of film editing software (Adobe Premier, Lightroom). My Life Sciences teacher reviewed my results.	





# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Alexa Vasquez</b>	<b>Project Number</b>  <b>J0423</b>
<b>Project Title</b>  <b>Media Mindlessness</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The main objective of the project is to identify if students are more impressionable into choosing an image with more number of likes than teachers. I predicted that if students and adults were to be presented with two choices, each with a different number of likes, then the middle schoolers will choose the option with more likes most often, because students will be influenced in their decisions by their peers more than adults.</p> <p><b>Methods</b> To collect my data, I made google forms online and surveyed my subjects, from both groups, by asking them to choose their preferred image. There was a total of 30 students from each grade in middle school and 30 teachers from each grade. The test was designed in two parts, the first part with the original pictures. While, in the second the amount of likes was flipped. In the google form, for each of the 4 sections there was a pair of images. One with a greater amount of likes over the other. Teachers and students were tested separately for this experiment.</p> <p><b>Results</b> My results showed that my hypothesis was incorrect. The data illustrates that the teachers had a higher percentage in choosing some of the images with more number of likes. To finalize my results, I added up the total amount of votes from teachers and students from both parts. When I compared the results, it proved, once again, that teachers were more influenced than students through social media. However, there was another detail that I got wrong in my hypothesis.</p> <p><b>Conclusions</b> Based on my results, it shows that teachers are less independent than students. However, through my experiment I noticed another crucial detail. In both parts teachers and students chose the same images. Even though I got new participants in the second part to keep it fair, the results stayed the same. This lets me know that the images themselves are what persuaded these participants into choosing an image. It had nothing to do with ages or the number of likes. These results can impact advertising companies, adults and my peers. Companies want to bring in more consumers, so if they understand what is more appealing to the eyes of civilians, then they can get more people to buy their products. For adults and middle schoolers, it is important to know what can persuade them and what makes them more independent from the rest. I view this extremely important to know. I haven't heard anybody else do something like this, that is why I want to continue with it.</p>	
<b>Summary Statement</b>  As I identified in my experiment, teachers are more impressionable by social media than students based on the preferences of the images more than the amount of likes.	
<b>Help Received</b>  I conducted and analyzed the experiment by myself and my supervisor reviewed my work afterwards. I also want to acknowledge all the participants that were part of my experiment.	



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Paulina Wodarz</b>	<b>Project Number</b> <b>J0424</b>
<b>Project Title</b> <b>The Evolution of Human Feelings through Writing over Two Hundred Years</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> People's worldviews, opinions, thoughts, characteristics, and feelings are often reflected in the way they write. By looking at which kinds of words increased/decreased in their frequency, it is possible to determine how the world's emotions have changed. The goal of this project was to study the change in human emotions by looking at word frequencies and how they changed throughout the years.</p> <p><b>Methods</b> A large Corpus of Historical American English was used to research changes in words' frequency over the last 200 years. The words were searched in the corpus to find the frequency of usage per million words, at every decade. Each word was made into a graph on google sheets. Linear fitting was used to determine the slope, and hence the trend over time. Statistical significance of the results was determined by calculating the p-value, using online tools.</p> <p><b>Results</b> The first part of the research studied 15 common emotion words. It was found that most emotion words decreased in usage, except the words "tired" and "bored", indicating that emotions are becoming less passionate and less positive. The second part of the research showed that phrases "I" and "I don't care" increased, while "we" and "I care" decreased in frequency, demonstrating characteristics of isolation and independence. Finally, 115 common words were studied whose emotional "coordinates" (positive/negative and energetic/non-energetic) were known. It was found that energetic words decreased in frequency, and also, both very positive and very negative words decreased in frequency. All the results were proven to be statistically significant.</p> <p><b>Conclusions</b> All results indicated the decrease of strong (both positive and negative) feelings over the last 200 years. A connection with a documented rise in depression was discussed.</p>	
<b>Summary Statement</b> By studying changes in word frequencies in a written corpus over the last 200 years, it was found that words expressing strong negative and positive emotions have become less frequent, indicating the rise of indifference.	
<b>Help Received</b> My parents helped me with finding scientific papers, and also explained how to use online statistical tools.	