CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

Vibha Arramreddy; Sejal Krishnan

Project Number

J0402

Project Title

Effects of Emotions on Test Takers

Abstract

Objectives/Goals

In our project we wanted to figure out what would be the best emotional setting for a student to take a test. Many students know they have to memorize information and stay up late, but no one knows what is the best war to mentally prepare for a test. According to Great Schools, there is a part in the brain, the limbic system, that acts essentially as the final gate between what a person knows, and what they can recall on a test. This demonstrates the importance of a mental state when in a testing area. Therefore, if emotions affect how well a student does on a test, then the test taker feeling relaxed will ensure them a high grade.

Methods/Materials

For each emotion, the participants would do something different in our experiment. If we were testing for control, they would simply take the test without any outside influence. However, for happiness, sadness, and motivation we would show them a video that represented each emotion. Also, for scared we told them two horror stories, while making them close their eyes, to imagine themselves in a dark place. For stress, we just cut down the time limit by three minutes. Finally for relaxed, they would take deep breaths, think about the beach, and about how they had no work due. Then we made them take a test for 8 minutes, aside from stress which was for five minutes. This process was repeated for each participant for every emotion.

Results

We found that the happy tests showed the highest average, that being 89.06%. Next, we had control at 86.07%, motivational at 85.03%, stressed at 83%, sadness at 86.3%, relaxed at 83.82%, and scared at 84.82%. Our hypothesis was incorrect since the overall average was 83.82% for relaxed, but with happy it was 89.06%.

Conclusions/Discussion

Due to this experiment and our research we have concluded and confirmed two facts. First, emotions really do affect how well a student does on a test therefore showing the importance of mentally preparing for an exam. This can be shown since some averages were higher than the control and some were lower. Also, Our hypothesis was incorrect since the overall average was 83.82% for relaxed, but with happy it was 89.06%. Therefore, through our results and the fact that 89.06% was the highest average, if a student is happy and smiling there are in the best mental state possible to take a test.

Summary Statement

We found that emotions did have an effect on test takers, and that the most benefical emotion was different for each subject.

Help Received

Me and my partner designed and performed the experiments by ourselves. Our science teacher, Mrs. Morgensen, provided us the room for the testing space.

Name(s)	Project Number
Mahnur A. Bharucha	**J0403**

Project Title

Wonder Pets: The Effects of Animal Assisted Therapy on Children with Autism

Abstract

Objectives/Goals
The purpose of this study was to observe the effects of animal-assisted therapy on children with autism disorder. The hypothesis was that the real rabbit would have the most effect on the social abilities of children with autism disorder compared to controls, one being a ball and a stuffed rabbit.

Methods/Materials
The study was conducted at the Leroy Haynes Autism Center. Four male participants ranging from the ages six to eleven participated in this study. Each participant experienced all three conditions: ball, stuffed rabbit, and real rabbit. Participants experienced all three conditions in ten individual sessions and ten group sessions. A short form version of the Profile of Social Difficulty (PSD) rating scale was used to assess changes in social interaction abilities. The PSD is recognized by the Ohio Center for Autism and Low Incidence as an appropriate assessment measure.

Results
Results indicate that animal-assisted therapy with real rabbits is more effective in helping autistic children improve social interaction abilities compared to a stuffed rabbit and ball. Trend lines indicate that interaction with real rabbits helped participants improve social interaction abilities across all dimensions of the PSD: fundamental skills, social initiation skills, social response skills, and getting along with others.

Conclusions/Discussion
Results support my hypothesis and lend further support to the general idea that animal-assisted therapy can significantly improve the social skills of children with autism disorder. Whereas previous research on assisted per therapy has focused mainly on dogs, my project innovatively used rabbits. Rabbits are easier and less costly to keep than dogs. In the future, I would like to test which animal can improve autistic children#s social skills most effectively.

Summary Statement

The Effects Of Animal Assisted Therapy On Children With Autism.

Help Received

The Leroy Haynes Autistic Center allowed their students to participate in my study.

Name(s)

Tyler J. Billings

Project Number

J0404

Project Title

Does College Help Basketball Players or Hold Them Back?

Abstract

Objectives/Goals
The objective of this project, is to find out whether or not college helps basketball players perform better in the NBA.

Methods/Materials
Computer. Tested 140 NBA players. Players had to be drafted from 1995-2005, and within the first 14 picks. Placed all 140 players into six different groups: players who went straight from high school to the NBA, players who came to the NBA internationally, players who played one, two, three or four years in college. Conducted three different tests for each group: percentage of players who played ten or more years in the NBA, percentage of players with at least one NBA All Star appearance, and average NBA All Star appearances per player.

Results
The first test showed that high school players had the most NBA All Star appearances with 2.5 appearances per player. The second test showed that players with one year of college experience was the most consistent group with 44.4% of their players having an NBA All Star appearance. The final test had high school players having the best mark with 82.4% of their players having played ten or more years in the NBA. Overall the results showed the the players who cam straight from high school to the NBA were the most successful, finishing 1st, 2nd, and 1st in all of the test.

Conclusions/Discussion
The results revealed that high school players that were drafted within the first fourteen picks of the draft, were more successful then those who came from college, or internationally. Therefore, if a player is elite enough in high school to be a top 14 NBA draft pick they should go to NBA instead of college beforehand.

Summary Statement

High school players that were drafted within the first fourteen picks of the NBA draft, were more successful then those who came from college, or internationally.

Help Received

My father helped me refine the structure of my project.

Name(s)	Project Number
Juliana Carrillo; Jaclyn Rawnsley	**J0405**

Project Title

Light vs. Sleep

Abstract

Objectives/Goals
The object of this study was to determine how different colors of light affected you while sleeping. Out of the colors (purple, green, red and white), we believed that the purple light would affect our sleep the least.

Methods/Materials
Fitbits - using the sleep feature; we tracked our sleep patterns to determine how long it took us to fall asleep, how many times awake/restless, and how many minutes we were awake/restless. Colored light bulbs (purple, green, red and white) - each tested while sleeping with light on all night.

Results
We found we were able to sleep the best with the purple light and we had the worst sleep with the red.

Conclusions/Discussion
Our goal was to find out whether light affects our sleep and how. This project showed us that purple light helped us sleep calmly and longer while the red light kept us awake and disturbed.

Summary Statement

Our project is about finding how different colors of light affected you while sleeping.

Help Received

None. We created and tested the lights ourselves.

Name(s)	Project Number
Sadie L. Cook	**J0406**

Project Title

Cyber Sadness

Abstract

Objectives/Goals
The object of this study is to determine whether every case of cyberbullying, no matter the size, affects the
symptoms of depression.

Methods/Materials
I developed a questionnaire to evaluate the affects of cyberbullying on the symptoms of depression. I was given guidance by Dr. Shanna Puels in creating my questionnaire. The questionnaire was administered to 104 Heritage students who had experienced cyberbullying.

Results
After doing my science project, I discovered that my hypothesis was incorrect. Not every case of cyberbullying affected the symptoms of depression. However a great majority of the bullied students did begin to show symptoms, or an increase in symptoms, after being bullied. I realized that more girls were affected than boys, but also many more girls were cyber bullied. There is still much to discover by looking further into my project because there are indefinite causes, symptoms, and types of depression.

Conclusions/Discussion
I hypothesized that ever case of cyberbullying would affect the symptoms of depression. However, after completing my project, I discovered that I was wrong. Some people were not affected by the bullying. Many of the students did experience an increase in symptoms, but not every student. I realized some people may have not taken the quiz entirely truthfully, and answered how they wanted to feel instead of how they truly felt. It dawned on me that a great majority of my classmates may be depressed, and many of them put up very convincing defenses. I learned that while surveys are a great way to learn about people, it is also extremely insubstantial way to evaluate a person. My project helped students understand more about how they feel, and it also helped people understand the situation. It is really necessary for students to understand the ways their peers may feel, that way instead of judging others, they can help them. However, it is equally important for teachers and counsellors to understand, and to try to make a difference as well. My project can help show that to everyone.

Summary Statement

I created and administered a questionaire that showed not every case of cyberbullying affects the symptoms of depression.

Help Received

Mrs. Shanna Puels, a psychologist in my area, answered some of my questions and gave me a Childhood Depression Evaluation to base my questionnaire.

Name(s)	Project Number
Coraline C. Crannell	**J0407**

Project Title

Gender Stereotypes: How Can Gender Stereotypes Affect People's Choices?

Abstract

Objectives/Goals
The objective of this study was to determine some of the variables that make up gender stereotypes and whether people's choices can be affected by them.

Methods/Materials
10 test subjects of each gender ranging in age from 8-62 presented with three tasks. Participants first presented with a series of images of 10 athletes of each gender who played one of 10 sports, which were all listed before the participant, and then had to guess which sport each athlete played. Next participants given 50 notecards, each with one word on it that might suggest a gender stereotype, and had to sort all the words into sections of male or female as fast as possible and then repeat this activity, this time given much more time and an added section for both genders. Lastly, participants presented with images of 6 different toys and asked which they would give to a young boy, young girl, and an 8 year old child.

Results
Subjects did base their choices off of gender stereotypes, in the first and third tasks subjects were more stereotypical towards feminine ideas, subjects of different cultural backgrounds were more stereotypical in the first and second tasks, and teenagers were slightly less stereotypical, especially in the second task. In the first task sports that might be considered as being "feminine" such as dance were guessed the most for female athletes and the least for male athletes and vice versa. In the second task, both the first and second times subjects abided by gender stereotypes, however much more so in the first. The second time, terms that had been sorted as being for females were integrated much more easily into being associated with both genders, however even more male stereotypes arose as being strictly masculine. The third task really represented the impact of gender stereotypical marketing, as almost all subjects abided to them, aside from a few coming from different cultural backgrounds.

Conclusions/Discussion
This data shows that gender stereotypes do impact us and play a role in the choices that we make, in numerous ways, and that when dealing with people in real life, it is important to consider these findings so that we as a society might be able to reduce the impact and importance of these restraining norms.

Summary Statement

I determined many of the variables that affect gender stereotypes and showed how they affect people's choices.

Help Received

No help was provided for this project. I thought of, set up, and performed all testing by myself.

Name(s)	Project Number
Jill C. Dailey	**J0408**

Project Title

Does Confidence Matter?

Abstract

Objectives/Goals
The object of this project was to test the effect of positive (cheering) and negative (booing) affirmations on a person's skill in sports.

Methods/Materials
The participant first takes pretesting survey to collect general information. Next they shoot ten baskets, this gives me their baseline skill level. Then the participant is blindfolded and people are brought in to either cheer or boo the subject as they take two shots. The people brought in to do the cheering or booing then leave,and the participant removes the blindfold. Finally, the participant shoots ten more baskets to show the effect of the affirmations.

Results
I used the paired T test calculator provided by Graphpad.com to compare the averages of two groups, before and after the affirmations. Using this calculator, it was discovered that the data collected in the cheering portion of testing was not statistically significant with a P value of 1.0000. There was no mean difference before and after the the cheering affirmations. On the booing portion of data, however, when using the same program it was discovered that the data was extremely significant with a P value of 0.00001. There was mean difference of 1.07 shots made after the negative affirmations as a result of the booing affirmations.

Conclusions/Discussion
In conclusion, my hypothesis was supported by the data collected through the booing portion of testing. The data was proved extremely significant using the paired T-test, with a P value of 0.00001. The data collected on the cheering portion of testing was not statistically significant with a P value of 1.0. According to Skinner (2013), the coach#s confidence level was a direct correlation to how the team performed in competitive situations. This leads me to believe the booing portion of testing does influence a player's confidence and consequently their performance. Therefore, the result of booing having significance is an indication that cheering could possibly also work. This could be supported by increasing sample size, a difference approach on cheering rather tha lot of white noise, or being selective on what subjects are chosen based on their experience with basketball.

Summary Statement

I found that booing (negative affirmations) have a large effect on a person's confidence, and cheering (positive affirmations) had no statistical significance but I believe significance of cheering could be shown with altered testing.

Help Received

I tested and collected all of my data on my own, but my science teacher/advisor taught me the meaning of the statistical analysis program I used.

Name(s)	Project Number
Sean F. Duarte	**J0409**

Project Title

Does Password Complexity Increase with Age?

Abstract

Objectives/Goals
The objective of this study is to determine if people's passwords get more complex with age.

Methods/Materials
Gathered 3 passwords from each of the 127 different people through the use of Survey Monkey, an online survey tool. Created an algorithm in Excel to determine password complexity.

Results
The algorithm that I devised allowed me to easily determine password complexity for each password, average password complexity by age, and the running average password complexity by age.

Conclusions/Discussion
Password complexity generally increased with age, but did not decline after age 60. After age 60, 50% of the passwords were better than the passwords from younger participants.

Summary Statement

I devised an algorithm that determines the complexity of passwords and how this complexity changes based on the age of a user.

Help Received

My parents helped gather most of the adult participants for my project. I also used a user-defined function, from an internet search, to determine if special characters were present in a cell in Excel.

Name(s)	Project Number
Michelle J. Garcia	**J0410**

Project Title

Examining the Bullying Nature in Preverbal and Verbal Children

Abstract

Objectives/Goals
The objective to my science fair project is to find if preverbal infants, toddlers, preschoolers, and adolescents show sympathetic responses for the #Bullying Victims#.

Methods/Materials
I will be using children ages 10 months to the age of 14. I am using children from this age group because they are learning more and more about emotions everyday. I plan to test the subject at a time when they are least distracted, for example after a nap, or after feeding. I will then show the subject the video and have my assistant time how long it takes the child to watch them video and pick an object shown in the video. Some children have to be shown the video more than once, due to distractions around them. Usually if the younger infants laughed during the video, he/she is more likely to ended up choosing the #Bully# in them videos.

Results
After testing my theory on if a certain age group would show more sympathetic responses for others in distress, I found that the younger the child, the more sympathy, and the older the child, the less sympathy, and the more the results were 50/50. My original hypothesis stated that the youngest group of kids would show less sympathy for others who are in distress. During my experiment, I noticed that as the age group got older the more the results were 50/50, there was one age group that has results that were very different than all the other groups. The students in the Early Elementary stages were the most aggressive, 70% of the subjects picked the victim and 30% picked #the victim.#

Conclusions/Discussion
I have learned that my hypothesis for if younger children would show the least sympathy for #the victim# is incorrect. I now have a better understanding of children their emotions and aggression, and also a better understanding of how children will react when they come across problem with bullying in the future. I believe mid elementary students and late middle school students had a 50/50 because there is a program we have been doing since 1st grade called Olweus (a program designed for students to be prepared for a bullying situation), which helped the student feel sympathy for the victim .

Summary Statement

My experiment showed that preverbal children showed sympathy towards the victim and the verbal students showed a mix of results towards the victim.

Help Received

Jewely Lickey, Science teacher at Sanger Academy Charter School provided testing area

Name(s)	Project Number
Jasmine T. Gates	**J0411**

Project Title

The Psychology of Belief: The Placebo Effect vs. the Power of Suggestion in the Effectiveness of the Velox Energy Drink

Abstract

Objectives/Goals

The objective of my experiment is to determine whether a test subject given a placebo energy drink will have a similar rate of improvement (in running and reflex tests) to a test subject that is given the specific facts (actual ingredients) about the drink, but is also given the suggestion that it will improve their energy level and physical performance. I want to determine whether knowing the desired outcomes in an experiment (even if there are not facts or data to support them) will affect the results.

Methods/Materials

Fake energy drink: Velox (a mix of herbal tea and water in standard water bottles with new labeling I designed), 2 different slide shows (1 for placebo effect group with false information regarding the effect of the ingredients, 1 for power of suggestion group with ingredients listed accurately), fake advertising flier I designed, energy level questionnaire, cups, timer, chalk (for run test) and reflex computer test (Human Benchmark Reaction Time Online Test). Tested 30 subjects (3 groups: Control, Placebo Effect and Power of Suggestion) in 50 meter timed run tests and online reflex tests before and after drinking Velox and being given different information on the 'energy drink'.

Results

In analyzing the three groups, the Power of Suggestion Group and the Placebo Effect Group showed similar rates of improvement in the 50 meter run test after drinking Velox (as compared to the baselines) and in the reflex test after drinking Velox (as compared to the baselines).

Conclusions/Discussion

The group that was given the factual information about the ingredients in the Velox energy drink and the suggestion that it could improve energy levels showed improvement in physical performance tests similar to the group that was given the drink as a placebo and given false information on the benefits of the ingredients as well as the desired outcome.

This experiment addresses the issues that can arise in any kind of testing based on what suggestions people are given during an experiment.

Summary Statement

I showed that suggesting what should improve after drinking a fake energy drink can have similar results to giving false information on the effectiveness of the ingredients.

Help Received

I designed the Velox labels and had the help of graphic designer Dawn Barnhart in using Adobe software to create the labels and fliers (printed at Kinkos). I created the slide shows and designed the running experiment. I used the Human Benchmark Reaction Time Online Test for the reflex test.

Name(s)	Project Number
Chloe M. Green	**J0412**

Project Title

The Effect of Perceived Risk on the Video Game Performance of Middle School Players

Abstract

Objectives/Goals
The objective of this project is to study how the amount of risk a person perceives in a situation affects their performance of a task in that situation.

Methods/Materials
A laptop computer with a simple video game I programmed on a visual coding site. 27 middle school subjects played the video game, believing that they had either one try, three tries, or infinite tries. However, all subjects actually had only one try to complete the game.

Results
The percentage of each testing group that finished the game in one try was recorded. No players in the one-try category finished the game, 14.2% of the three-tries category finished the game, and 28.5% of the infinite-tries category finished the game.

Conclusions/Discussion
The more tries players thought they had, the more likely they were to finish the game. This result shows that smaller amounts of perceived risk improve middle school students' performance at a task. This experiment implies that teachers can help students do better on tests by downplaying the test's difficulty or importance.

Summary Statement

I found that a smaller amount of perceived risk increases performance of a task.

Help Received

I received no help on this project, designing and running the experiment on my own. I programmed the video game used in this experiment myself.

Name(s)	Project Number
Anthony M. Howard	**J0413**

Project Title

The Relationship between Exam Stressors and Eating Behaviors

Abstract

Objectives/Goals
The purpose of this project was to examine the association between academic exam stressors and executive functioning and negative eating behaviors.

Methods/Materials
Field Experiment: random test group; random control group; random nine-digit assigned numbers; verbal assignments; 30' marked walking path; interruption with choice of either Fuji apple or Hostess Cupcake offered

Results
In attempt to trigger exam stressors by overloading brain with long numbers to memorize, we interrupted test group while they walked along marked path from Experimenter A to Experimenter B and offered choice of healthy or unhealthy snack. My results were inconclusive and further research must be conducted. Of 15 participants in test group, only one chose the cupcake and two chose the apple. Of the control group, three chose apples and zero chose the cupcake.

Conclusions/Discussion
My results were inconclusive. I need to conduct experiment again with a larger group of random participants. I need to repeat experiment across unaccounted for variables, such as time of day, day of week, and geographic location. Further, I want to administer a questionnaire, such as The Three-Factor Eating Questionnaire-R18 (TFEQ), so participants can also self report.
I am passionate about this topic because childhood obesity is a dangerous and ultimately fatal epidemic. After the increase of standardized testing resulting from The No Child Left Behind legislation from 2001, to the implementation of Common Core, children and adolescents are experiencing more exam and academic stress than ever, however I don't see that adults in our society are doing enough to help them cope with the added stressors and anxiety these academic changes have brought. Obesity negatively impacts social relationships, self-confidence, health and academic performance. I feel strongly that more emphasis must be placed in helping students manage their physical and emotional responses.

Summary Statement

I hope to examine and bring light to the impact academic and exam stressors have on the childhood obesity epidemic in our country. Our education system must take greater ownership in the resulting disinhibitive eating behaviors.

Help Received

I designed my experiment myself. For lab assistants, I enlisted the help of my 22 year old brother, Garrett Thomas, his 19 year old friend, Morgan Minhall, and my mother, Victoria Howard. While researching, scientific method and best practices, I interviewed the following scientist and engineers: Mark

Name(s)	**Project Number**
Alexa Q. Infelise	**J0414**

Project Title
Impact of the Decoy Effect on Promoting Positive Choice in an Academic Setting

Abstract

Objectives/Goals
I often find myself buying more than I need, simply based on the price. Through research, I learned that I was being influenced by the decoy effect, a phenomenon in which consumers will change their preference between two options when presented with a third decoy option. I believed that the decoy effect could be used to influence students to select a more difficult assignment by introducing a less difficult option to a set of two others: an easy option and difficult option.

Methods/Materials
In order to test my hypothesis, I tested fourth through eighth grade students in a classroom environment. In one test, they were presented with two options: a two-paragraph essay for no extra credit (easy) and a six-paragraph essay for 5% extra credit (difficult) In another test, a decoy option (less difficult) was introduced: a five-paragraph essay for 2% extra credit.

Results
I found that 7% more students chose the difficult assignment when presented with the decoy option. In fact, when two extra credit options were presented, 84% more students selected an extra credit. This meant that there was a 50% decrease in students who picked the easy option when a decoy option was introduced. I saw that not only was there a significant increase in students who chose the more difficult option, but there was also an impressive number of students overall who decided to do more work and choose one of the extra credit options, rather than the standard easy assignment. The decoy effect was evident in all demographic categories I tested.

Conclusions/Discussion
I believe that by changing the way assignments are presented to students, educators can influence students to set higher goals. The decoy effect impacts all demographic variables. In the future, I would like to test students from different socioeconomic classes and test different decoy options.

Summary Statement
The purpose of this project was to see if the "decoy effect" could be used to influence students to set higher goals.

Help Received
My science teacher helped me to carry out my experiment and my father helped me create graphs and charts in Excel.

Name(s)	Project Number
Samantha J. James	**J0415**

Project Title

What Colors Are Preferred by Children of Certain Ages?

Abstract

Objectives/Goals
The objective of this study is to determine the color preferences of children of various ages and genders and to compare the results with the stereotypes of girls preferring pink and boys preferring blue.

Methods/Materials
I created more than 232 survey papers which included a request for the students from my school to supply me with their age, gender, and color preference.

Results
The overall average color preference for any gender was blue, though there were some variations in the results of certain ages. As a whole girls preferred blue, but pink was a close second preference. On the other hand, boys predominantly preferred blue.

Conclusions/Discussion
Based on my research, I have found that the stereotypes of girls preferring pink and boys preferring blue are not completely correct. With the overall result of the preference for blue across ages and genders, it appears that the typical use of pink for girls and blue for boys in restrooms, signage, toys, and other products is not fully representing the common interests of each gender nor is it affecting children's color preferences.

Summary Statement

I surveyed students ages 5-14 to determine what the preferred color was for boys and girls of those ages.

Help Received

I designed my survey papers on my own with some advice from my science teacher. In executing the surveys, the teachers at my school were very cooperative and supportive.

Name(s)

Allison Jia; Jasmine Wiese

Project Number

J0416

Project Title

Delicious or Disgusting? The Effects of Priming on a Taster's Reaction and Perception of Food

Abstract

Objectives/Goals
Our project tested the effect of using audible and visual priming on a person's perception of food.

Methods/Materials
We used two visually different types of cookies, a positive script, a negative script, and a survey. Various participants ate their respective cookies and then filled out the survey in separate rooms.

Results
All of the groups receiving positive visual priming gave higher average ratings of cookies than those receiving negative visual priming. Groups receiving positive audible priming also gave higher ratings than other groups receiving negative or no audible priming. However, all groups receiving negative audible priming gave higher cookie ratings than groups with no audible priming.

Conclusions/Discussion
Since positive visual and audible priming resulted in the highest rating, we discovered that visual and audible priming do play a major role in a taster's perception of food. As expected, each group responded more positively whenever positive priming was received. Surprisingly, since groups receiving negative priming gave higher ratings than groups receiving no priming, we realized there were other factors involved: the environment and modeling behavior.

Summary Statement

As evidenced by participant survey data, we found that social modeling influences a person's perception of food desirability in addition to visual and audible priming.

Help Received

We designed and executed the experiment with assistance from our science research mentor, Ms. Kathy Peng. Dr. Weiwen Wang of the Chinese Academy of Sciences also helped review our participant data and answered our questions concerning project layout.

Name(s)	**Project Number**
Christopher C. Kulick	**J0417**

Project Title
The Effectiveness of Vehicle Speed Feedback Signs

Abstract

Objectives/Goals
The objective of this project was to determine if vehicle speed feedback signs are effective in reducing speeds.

Methods/Materials
A radar gun with pencil, paper, and clipboard to record observations while positioned near street. Measured speed of 100 vehicles approaching each of 4 different signs and also measured speed of speeding vehicles before and after 2 of the signs.

Results
To determine if the Vehicle Speed Feedback Signs are effective in reducing speeds, we collected data two different ways. A first collection effort was performed with the goal of recording vehicle speeds as they approach VSFS to determine if the 85th percentile speed is at or below the posted speed limit of 40mph. A second study was performed to collect data to isolate individual driver behavior in response to the signs.
 The first study results showed that all signs failed to achieve the goal of the 85th percentile of drivers complying with the posted speed limit of 40 mph. The best achieving sign, Northbound Sign 1, reported a 43 mph 85th percentile speed.
For the second speeder study, the results continue to indicate that the signs do not result in the majority of drivers reducing their speeds. The results show the majority of vehicle maintaining the same or increased speeds; the Northbound sign had 82% of drivers with the same or increased speeds and the Southbound sign had 75.5%.

Conclusions/Discussion
My study of the 100 vehicles at each sign showed that none of the signs were successful in getting vehicles to reduce speeds to the 40mph speed limit. The best performing sign achieved a 43 mph speed with 85% or the majority of drivers. The other signs achieved either 44 or 45 mph speeds for 85% of drivers observed.
 The individual speeder study where I isolated speeders and took speed observations before and after the signs also showed limited effectiveness in influencing the majority of drivers to reduce speeds. The Southbound Sign 1 showed that 24% of speeders reduced their speed and the Northbound Sign 1 showed only 18%. In reviewing the post sign data, only 8% of speeding drivers reduced their speed to the 40 mph limit for the Southbound sign and 2% of drivers reduced to the limit on the Northbound sign.

Summary Statement
I was able to observe that vehicle speed feedback signs are ineffective in reducing the speeds of vehicles under the posted speed limit.

Help Received
I met with Rob Blough City of Encinitas Traffic Engineer to review data and implementation details of the vehicle speed feedback signs I studied.

Name(s)	Project Number
Cuyler R. Lusk	**J0418**

Project Title

Is Smiling Contagious?

Abstract

Objectives/Goals
The objective of this study is to determine whether smiling is contagious (to test whether smiling is passed on between people).

Methods/Materials
Mall, 320 random test subjects (human), my smile! Walked through the mall and recorded responses (smile or no smile) of test subjects when smiled at and not smiled at.

Results
Only 21% of the 160 people I did not smile at smiled at me. 71% of the 160 people I smiled at returned the smile. This showed that more people smiled at me when I smiled at them instead of when I did not smile at them.

Conclusions/Discussion
Multiple trials of smiling and not smiling at shoppers around the mall determined that smiling is contagious. The data shows that smiling back at someone when they smile is a natural reflex that most people do. This experiment proves the theory of mirror neurons for smiling.

Summary Statement

I determined that humans are more likely to smile when smiled at than when not smiled at.

Help Received

My science teacher helped me make my project study more specific. I planned and performed the experiment by myself.

Name(s)	Project Number
Shree R. Narasimhan	**J0419**

Project Title

OTC Drug Use and Abuse by Elderly Adults

Abstract

Objectives/Goals
The objective of this study was to find out if elderly adults in a small temple town in South India self-medicate and the reasons for self-medication.

Methods/Materials
During this experiment a series of materials were used to mostly record data or help record it. A voice recorder was used to record a senior citizens interviews as a back-up to writing notes. A writing utensil is needed to record data on the questionnaire. A questionnaire was used to ask questions that were directly related to exploring the hypotheses. A computer was used to put data into an EXCEL spreadsheet when done. The most important one is at least 100 to 200 or more elderly adults had to be interviewed for the study.

Results
Results indicated that 40/163 adults or 25% adults took OTC drugs concurrently with prescription medication. Approximately 75% or 122 people out of 163 people did not know what interactions meant thus seniors did not know the consequences that come with drug interactions. Only 24.5% of seniors in the study relied on information from unqualified individuals.

Conclusions/Discussion
When looking over the results only hypothesis two was correct. Hypothesis one and three were incorrect. Hypothesis one it stated that 75% of seniors will take drugs concurrently. Results indicated that the number was close to 25%, not 75%. Hypothesis three was incorrect because it stated that 30% of the individuals will get information from unqualified individuals. Results indicated that only 24.5% of the individuals received information from unqualified sources. This shows that while doing the study not many seniors did self- medication in this particular temple town.

Summary Statement

The purpose of this study was to find out if seniors in India do self-medication a lot and why as said in previous studies that were done on this topic.

Help Received

Mrs. Elaine Gillum- Is very supportive and helped with editing the papers. Always gives great ideas!
Parents- Mom gave me good ideas on how to make the paper sound better. Dad helped with logistics

CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)	Project Number
Samantha J. Owada	**J0420**

Project Title

The Power of Music

Abstract

Objectives/Goals
To show that different genres of music will affect the boys' heart rate and blood pressures differently than the girls'.

Methods/Materials
Study materials include: headphones, iPod, automated heart rate and blood pressure monitor, and timer. Take boy subject 'A' to neutral sound room and hook subject up to monitor. Activate monitor. Record resting heart rate and the systolic and diastolic blood pressure. Play jazz music for 2 minutes, then record heart rate and blood pressure in journal. Set timer for 1 minute and wait for subject's heart rate and blood pressure to become steady. Repeat this for the next 3 genres of music. Repeat the above steps for the rest of the subjects. There was a total of 4 boy subjects and 4 girl subjects.

Results
The boys' heart rate and blood pressures fell while listening to jazz music; whereas the girls' heart rate did not decrease but their blood pressure did. For classical music, the boys' and girls' heart rate and blood pressure increased. When listening to alternative music, the girls' and boys' blood pressure did not drop. However, the boys' heart rate decreased when the girls' heart rate did not change. For rock music, the girls' had a higher heart rate and systolic blood pressure. But the boys' and girls' diastolic blood pressure had no change.

Conclusions/Discussion
The boys' heart rate and blood pressure did react differently than the girls' when listening to 4 genres of music. An important finding was that out of the majority of the subjects, jazz decreased their heart rate and blood pressure. In the research on hospitals using music to help cardiovascular patients recover from surgery, classical music made the heart rate and blood pressure decrease but in the experiment it increased. This could be helpful in everyday life because kids with cardiovascular failure could listen to jazz music to help them recover from surgery.

Summary Statement

Different genres of music affects the boy and girl subjects' heart rate and blood pressure differently.

Help Received

Used automated heart rate and blood pressure monitor borrowed from the cardiology unit at Valley Children's Hospital and supervision of Dr. Carl Owada

Name(s)

Alina V. Pollner

Project Number

J0421

Project Title

Electronic Media vs. Paper: Effect on Teenagers' Reading Comprehension

Abstract

Objectives/Goals
The goal of this experiment was to determine if electronic media or paper produced better reading comprehension for current-day eighth graders.

Methods/Materials
Students were randomly assigned to one of two groups. Each group read the same two science-related articles, one on a Chromebook laptop, and the other article on paper. Statistical evaluation used normalized scores to remove any potential effect of differences in difficulty between the two articles.

Results
This study determined that there was no statistically-significant difference in students' reading comprehension scores between paper and screens, with a p value of 0.98.

Conclusions/Discussion
The students that were tested grew up with technology, and have been accustomed to reading on electronic media since they were young children. It was concluded that this familiarity with technology likely caused them to outperform adults when compared with previous research. Future experiments are recommended to confirm this conclusion.

Summary Statement

It was concluded that there was no statistically significant difference in reading comprehension between electronic media and paper for younger students.

Help Received

My father brought home his laptop, and I used his graphing software to professionally display my results. Other than this, I received no help.

Name(s)	Project Number
Lily C. Purvis	**J0422**

Project Title

Reading Emotions in the Eyes: Age and Gender Differences in Empathy

Abstract

Objectives/Goals

The purpose of my study was to determine if children or adults are better at identifying other people's emotions just by looking at their eyes. I hypothesized that children would perform better than adults because children are more dependent on other people and more focused on their social relationships with friends and family.

Methods/Materials

To test my hypothesis I collected data from 89 junior high students (mean age = 13) and 109 adults (mean age = 28). I created an online test that had 25 questions. Each question showed a photo of a set of eyes, with four possible emotions. Subjects had to choose which emotion they thought was shown in the photo. This test was based on a longer test (Reading Emotions in the Eyes Test), which was developed by scientists to study empathy. All participants completed the online test in their classroom or at home. For students, I gave the test in science classes. For adults, I posted the test on Amazon Mechanical Turk, a website where people can complete online projects for a small payment.

Results

I calculated the average score for adults and children, and for males and females in each group. Contrary to my hypothesis, adults performed significantly better than children. Adults had an average score of 76.08%, while children had a score of 70.48%. The adults did 5.6% better. In addition, female participants performed better than males in both age groups. Females scored an average of 74.96%, while males scored an average of 71.64%.

Conclusions/Discussion

The results of my study showed that age and gender are factors that affect people's ability to read other people's emotions through their eyes, which is an important component of empathy. However, the age difference was opposite of what I predicted. Adults, rather than children, performed better. One reason may be that adults have more experience with human emotions, more time to understand what each emotion looks like. Another reason might be that the photos showed only adult faces. Children might have performed better if they had seen photos of children. My study also found that females did better than males in both age groups. This may be due to a maternal instinct that gives women insight into what their child could be feeling even when they cannot yet voice their emotions. Another reason might be that girls are taught to be more caring toward other people.

Summary Statement

My study compared children and adults in their ability to identify other people's emotions just by looking at their eyes (an important component of empathy).

Help Received

My mother helped me obtain human subjects approval and post the surveys online at Amazon Mechanical Turk. She also helped me conduct some of the statistical analyses. My science teacher helped me collect data in three of her sciences classes.

Name(s)	Project Number
Talhah A. Raheem	**J0423**

Project Title

Are You a Digital Citizen? An Analysis of How Digital Citizenship Education Can Improve Online Behavior in Schools

Abstract

Objectives/Goals

When you apply for a job, you probably had to turn a paper or email resume. But when I grow up and apply for a job, employers will probably google me or look me up on social media to see what I am doing. Social media has led to major problems such as cyberbullying. Technology is rapidly changing and is becoming more important in our lives. Adults did not grow in this kind of environment and so many struggle with how to teach effective use of technology. School is a place where we learn the skills we need to be successful both in our jobs and as physical and digital citizens. If schools don#t teach us to use it effectively, we can use it in a good or bad way. And if we use it in a bad way, then tomorrow when our employers google us, we might regret what we posted on social media. If schools teach students how to use technology properly, will it affect their habits online and make them good digital citizens?

Methods/Materials

I tested students from third to sixth grade. I made consent forms that were signed by the principle and computer teacher. Then, I had students fill out a Pre-Test and a Digital Citizenship Survey form that I created. I taught the presentation using a program called Nearpod to all the students and had them fill out an Activity form while I was presenting. After the presentation, I had the students fill out a Post-Test. After two months, I had the students fill out a Post-Post Test (pre-test,post-test,and post-post test have the same questions).

Results

The average score of the Pre-Test was 42.50%. The average score of the Post-Test was 84.50%. The average score of the Post-Post Test was 57.00%.

Conclusions/Discussion

Technology is on the rise and it is important for us to use it #safely, responsibly, and respectfully.# The students were taught in just twenty minutes and they learned so much. This shows that if we teach students for a longer period of time, imagine what they can learn if this would be part of our academic curriculum? However, schools are ignoring this problem. They are not teaching this and we are having a generation where students are not learning about how to use the Internet effectively. We don#t know how to use social media because we do not know how to communicate online. In conclusion, if schools teach students how to use technology properly, it will affect their habits online and make them good digital citizens.

Summary Statement

Finding out if students# habits online will change and make them good digital citizens if schools teach students how to use technology properly, reducing issues like cyberbullying.

Help Received

My cousin, Sabba, helped me organize my project. Mr. Lavrov, my computer teacher, allowed me to use his classroom to teach my presentation to the students. My mother and sister helped me paste the board.

Name(s)	Project Number
Pratham P. Rathi	**J0424**

Project Title

Exploration of Factors Influencing Career Choice

Abstract

Objectives/Goals
The objective of this exploration is to look at and analyze different patterns present in an individual's profession choice.

Methods/Materials
Materials : Self-made surveys, large populations(I had 65) of survey participants, graphing tool, printers

Procedure: Create a survey that is easy to comprehend and sorts out the different variables that you want to explore. Then hand this survey out to as many people as you can coming from diverse backgrounds, in order to create more variety. Finally tabulate your results. Look for repeating patterns or relationships in the data.

Results
My data showed that individual's of a specific gender landed in the same job category as a parent of the same gender.This result seemed to hold more true for men rather than women, but nevertheless it was true for both genders. The second comparison I made was the ethnicity v.s. the individual's reason of motivation behind their achievements in academics. Caucasians, owed their educational success to their own personal motivation, Asian-Indians to their parents, and Hispanics had a mixed view.

Conclusions/Discussion
The interpretation of the data reveals that there are many factors behind an individual's choice of profession and that the strength of these factors contrasts for different ethnic groups. Caucasians tend to view their own self-motivation as their cause for success. Asian-Indians, picked their family for their academic achievement and Hispanics had a mixed perspective. Meanwhile, all the ethnic groups showed a majority of people who landed in educational level equal to or greater than one or more of their parents. This shows that there is a universal motivation to go above and beyond the achievements of the older generation.

Summary Statement

As shown in the results of my survey, there are various patterns that influence an indivdual's profession choice, and these factors differ in the different variables of ethnicity, gender, and various others unexplored variables as well.

Help Received

I created created the survey and designed the questions myself. My science teacher helped refine it and my parent's helped in handing them out.

Name(s)

Maleah A. Sumii

Project Number

J0425

Project Title

The Effects of Different Forms of Grading on Student Learning

Abstract

Objectives/Goals

The objective of my project is to determine which form of grading: self, peer, or teacher, enhances students' retention most. Self-grading being that the student corrects his/her own paper using an answer key, peer-grading wherein the students correct each other's papers, or teacher-grading (the most common) in which the teacher corrects the student's paper and returns it back to he/she.

Methods/Materials

A fifteen-word spelling test(written by my school's language arts teacher), about twenty subjects in 6th, 7th, and 8th grade, and 10 answer keys to the spelling test are needed for this experiment. Subjects were divided into four groups: self-grading, peer-grading, teacher-grading, and a control group. Each group took the same spelling test and graded it using the type of grading that their group was assigned. A week later each group retook the spelling test. This determined which group corrected the most amount of words in the second test that they missed in the first test.

Results

The peer-grading group corrected the most amount of words in test 2 that were missed in test 1. The control group was the second most effective and the self and teacher-grading groups had almost identical results.

Conclusions/Discussion

Due to the lack of subjects, my results were not completely accurate. Peer-grading, resulting in slightly better scores, is still understandable because based on my research, if you are actively involved in the correction process, then it will have a long-lasting effect on a student's memory. Nevertheless, this experiment still has merit because understanding which correction methods are the most effective would make a major difference in improving our education systems. In future studies, subjects should be tested in a real school setting and have more subjects.

Summary Statement

The purpose of this project is to find which form of grading: self, teacher, or peer, can have a long-lasting effect on a student's memory thus improving their learning capability.

Help Received

Sonja Bentley and Mr. Blanks

Name(s)	Project Number
Joshua D. Wozniak	**J0426**

Project Title
How Does Sound Affect Your Body?

Abstract

Objectives/Goals
I have always been curious about which sounds affect your body or raised your heart rate the most. I thought the more abrupt the sound was, the more your heart rate would increase because it would startle you. I tested 100 people, about 50 men and 50 women, and I played 10 different sounds for 10 seconds and recorded their change in heartrate. All of the sounds were played at the same decibel level and I used all of the same types of headphones. The results were interesting and surprising.

Methods/Materials
Participant wears headphones and places pulse oximeter on right pointer finger, play 10 different sounds for 10 seconds each, record change in heartrate. Finger pulse oximeters, recorder, Panasonic headphones

Results
My average results indicate the biggest positive number is 0.58 (baby crying) and the smallest negative number is -1.81 (Halloween sounds). This means that on average most people respond more to annoying sounds and disturbing sounds. When people hear a baby cry their heart rate will increase and they become stimulated to react to the situation. Conversely, when people hear Halloween sounds their heart rate drops and they are not stimulated enough to react. With regard to ones heart rate and weekly exercise, my study showed the more you exercise the more you will react to sound. However, you can still react greatly to sound with little to no exercise.

Conclusions/Discussion
I hypothesized the more abrupt the sound was, the more your heart rate would increase. My hypothesis was incorrect because first of all, the biggest change was a drop in the participant's heart rate and second of all, the sound that increased the most was an annoying sound. When the testing was complete, I had a new perspective on how sounds affect your heart rate. If your heart rate goes up, you become stimulated. The sounds that stimulated my participants were a baby crying, a woman screaming, and shattering glass. If your heart rate goes down, you were likely startled or fear struck. The sounds that spooked my participants were Halloween sounds, a firing machine gun, dogs barking, police siren, car crash, and nails on a chalkboard. The one sound that did not spark much reaction in my participants was cymbals crashing.

Summary Statement
After testing over 100 people I discovered that emotions play a big part in how people react to sound.

Help Received
I would like to thank my mother and father for guiding and supporting me in the testing process. I would also like to thank my water polo team, my school classes, and my neighbors. Finally, I would like to thank my science teacher Mrs. Culley.

Name(s)	Project Number
Anjali S. Zope	**J0427**

Project Title

Can You Spot the Liar?

Abstract

Objectives/Goals
My project is testing how good humans are at spotting a liar and the theory of whether you can spot a liar more efficiently by analyzing peoples body language and looking for physical cues. I am expanding my project to whether gender, age, or culture makes a difference in spotting a liar. I will also increase my survey sample size to 100+ people.

Methods/Materials
Materials:
Online Spot The Liar test from the New York Times

Methods:

First I had 30 people take the spot-the-liar test (containing videos of people). Afterwards I asked them what was their score (at spotting a liar accuracy) and how could they tell apart liars and non-liars. Their response was a list of physical cues.
Then I had 18 people take another survey-- this time I showed each person videos of people and and asked them to describe how they were behaving (given the options on the physical cue list). What they did not know, however, is that some of the people were lying, while others weren't. Afterwards, I compared how the non-liars and the liars behaved, because in order for the theory to be true, liars must do more physical cues.

Results
First survey: people are an average of 51% accurate when spotting a liar.
Second survey: The liars exhibited signs of lying (the physical cues) at an average of 26% of the time, while the non-liars had an average of 21.99%.

Conclusions/Discussion
From my results, I concluded that while liars do on an average exhibit more of the physical cues of lying (that people use to spot a liar) than non-liars, the difference between them is too small (only 4.01%) to conclude that physical cues are a thoroughly accurate way of spotting a liar. I believe that the reason people are not very accurate at spotting a liar (51% accurate) is because they use signs of lying that non-liars also express very much.
This shows that humans can't actually spot a liar that accurately using physical cues, and if they try to use them they should use further evidence to back it up.

Summary Statement

My project tests how accurate people are at spotting a liar and if you can spot a liar more efficiently by using physical cues.

Help Received

None. I researched, planned, and completed the project by myself.