CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

Ciann Amalan; Abby Yamashita

Project Number

J0401

Project Title

Are Handheld Devices Really Affecting Your Body?

Abstract

Objectives/Goals

The objective of this study is to measure the difference of degrees between head/upper back posture to texting posture in 11-14 year old students and comparing both males/females. Our goal is to test how type spent on an electronic handheld device affects pressure on your neck, back, or spine.

Methods/Materials

The equipment we used were a normal sized school chair, a goniometer (a device to measure the angles of the body), a tape measure, a phone case, and a normal weighted backpack (the weight did not change). We first had each student sit on the chair and used the goniometer to measure their normal everyday posture, then their normal texting posture. The student had to then stand up and wear the backpack while being in their texting posture which we measured with the goniometer. The last test was to measure their upper back posture sitting down using a tape measure while being in their normal posture, then in their texting posture.

Results

After looking at our data, the results showed that the majority of males aged 11-14 had a less change in posture than females aged the same. In the first test, 13 year-old females and 12 year old males had a less change in posture meaning their posture remained fine after texting. In the second test the majority of 14-year-old females and 13 year-old males had a less change in posture while 13 year-old females and 14 year-old males had a greater change. In the last test, 11 and 13-year-old females and 14-year-old males had the worst change in posture while the majority of 14 year-old females and 12-year old males had a considerable change in posture.

Conclusions/Discussion

In conclusion, our hypothesis was stated wrong since we hypothesized that girls at a younger age would have a higher change in head and back posture, but it was males that were more susceptible. This was because 98 percent of the 13-14 year-old students we surveyed stated that they texted 4 hours+ a day, while about only 6 percent of 11-12 year-olds stated that they had a phone, but used it rarely. Males also texted with their back more hunched affecting their thoracic and lumbar spine than the center of their cervical and thoracic.

Summary Statement

We tested the difference of degrees between normal head/upper back posture to texting posture on 144 students, 11-14 years of age, by comparing the results of both gender and ages to see which subjects would have a greater change in posture

Help Received

Dr. Ryan Monreal helped us find out a strong test while teaching us how to work with professional materials. Mrs. Pamela Yamashita was a physical therapist who helped us understand all the parts of the body. Mr. Jeffrey Yamashita was an athletic trainer who helped with the scientific names of our devices.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Ethan S. Aurand

Project Number
J0402

Project Title
How Pets Affect Stress

Abstract

Objectives/Goals
My objective was to find out how pets affected humans stress levels.

Methods/Materials
Blood pressure cuff, timer, volunteers, and a pet your volunteers like.

Results
The group with pets took on average 2 minuets to calm down from the physical stress, meanwhile the group without pets have a recovery rate of about 5 minutes

Conclusions/Discussion
Tho-ought my experiments i found out that when you interact with a pet your recovery rate is twice as fast vs if you did not interact with animal

Summary Statement
I measured the recovery rate of people with a pet and people with out a pet. I found out that you recover faster with a pet

Help Received
My parents and siblings for driving me to the Humane Society, with that I would like to thank the San Diego Humane Society for letting me use a room and borrow pets. Also I would like to thank Mr. Cabrera, Mr Hess, and Ms Huntington for helping me with grammar and setting up my project.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Gabriella R. Biittner

Project Number
J0403

Project Title
Detection of Gender Bias and Stereotyping by Grade Level and Gender

Abstract

Objectives/Goals
The objective of my study was to determine which grade level and which gender had the most gender bias. I tested 1st, 3rd, 5th, and 7th graders at my school along with adults who are employed by the school. I will also record if males or females are more gender bias.

Methods/Materials
A picture of a six month old baby dressed in stereotypical boy, girl, and gender neutral clothing paired with a prop that is stereotypically boy, girl, or gender neutral. My subjects were all of the 1st, 3rd, 5th, and 7th graders, along with adult teachers and employees at my school. A word bank with passive, neutral, and aggressive words. I presented the three pictures individually to all students and adults in the study. I asked them to select one word that best described the baby in the picture. I studied 69 total subjects. I compared which grade level and gender picked the most passive words for the girl picture and the most aggressive words for the boy picture. Since the number of subjects varied by grade I calculated the percentages of responses.

Results
The girls were more gender bias than the boys in my study. On the girl picture the girls chose more (71%) passive words than the boys (59%). On the boy picture both genders chose equal amounts of aggressive words (25% vs 21%). The adults had the highest percentage of passive words matched to the girl picture. The 7th graders used the most aggressive words to describe the boy picture.

Conclusions/Discussion
In conclusion, the girls were much more gender bias than the boys; preferring to describe the girl picture as passive. At all grade levels, the words that were chosen to describe the girl picture were overwhelmingly (more than 50% of the time) passive words. This could be because young girls have been getting compliments their whole life such as "you are so cute, pretty, or nice." This may affect the way females see other girls and themselves. Where as, the boy picture had much more variety of passive, neutral, and aggressive words selected from the word bank. The difference in gender bias among grades was not statistically significant.

Summary Statement
Gender bias and sterotyping were most strongly exhibited by the girls and for the girl's picture in my study.

Help Received
I designed and performed the experiment by myself.

Name(s)
Antonio S. Cortijo

Project Number
J0404

Project Title
Branding and Its Effects on Consumer Choices and Satisfaction

Abstract

Objectives/Goals
This experimental study examines whether branding (in this case, Google) influences people's consumer choices and satisfaction with products (in this case, styli). I used a between-subjects design. The independent variable was the brand name assigned to the styli. Even though the styli being tested were identical, my subjects had a strong propensity to choose the stylus when it was assigned a name brand (Google) versus a non-name brand (Lumos, a fictitious name). In addition, they were more satisfied with the product they had chosen. Several filler styli were also include in the experiment to reduce suspicion among subjects. This experiment illustrates the power of advertising in impacting our behavior.

Methods/Materials
I used different styli of various prices and quality and an Ipad. Subjects were presented with the different styli and used them with the Ipad. I recorded their choices and satisfaction ratings.

Results
Subjects were far more likely to choose the stylus when it was assigned a name brand. The null hypothesis was that there would be no difference in preference for the styli (50/50 chance). I conducted a Chi-squared test and rejected the null hypothesis (with $p < .05$). Their preference was unlikely to be a fluke. I also tested whether there was a difference in satisfaction ratings. I conducted a t-test and found a significantly higher satisfaction rating with the product when it was called Google ($p < .05$).

Conclusions/Discussion
The data support the hypothesis that popular brands have a direct influence on consumer preferences and satisfaction. This experiment illustrates the power of advertising in impacting our behavior.

Summary Statement
By using some deception, I demonstrated that brand names have a very strong influence on people's consumer choices and satisfaction.

Help Received
Mr. Brad Penkala (my teacher) helped me with the instructions for the project. My mother helped me with the statistical analyses and construction of the poster.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Sarah E. Crowley

Project Number
J0405

Project Title
Discrimination against Women Going into STEM

Abstract

Objectives/Goals
This project was to determine if there is discrimination against women pursuing STEM careers and a stereotype of men being more competent in STEM fields that is preventing young women from pursuing these fields

Methods/Materials
I created my survey with a flowchart and rough draft.I bought a SurveyMonkey account and inserted my final survey into my account.I shared my survey via email and in person, to as many students and adults as possible.Supplies:Computer,iPad,SurveyMonkey account

Results
Within just the high school and middle school age respondents, 52% of the 255 females and 49.7% of the 207 males I surveyed say they are reluctant to go into STEM fields because they:feel a bias or discrimination against their gender,weren't encouraged enough,think they don't have the grades for STEM,would rather be a full or part-time parent,or were afraid they would not be able to have a romantic relationship.I also found that there is a bias against both genders shown in STEM college classes, more female than male, but there is still a bias against both genders.My survey also showed that a majority of both genders say that they have seen more male bosses than female in their STEM workplace, and when comparing the amount of people who said that they have seen men paid more than women, to the people that said women were paid more than men, the total that answered men paid more than women, had almost 20 times more responses.There is discrimination and a bias against women pursuing STEM, for 30.2% of the 1,473 respondents I surveyed said they would not encourage women to pursue STEM, think men are more competent in STEM than women, and think a woman can not outrank a man in a STEM field

Conclusions/Discussion
I discovered that there are current stereotypes and discrimination against women pursuing STEM careers, and this discrimination does affect how young females, and males, see STEM careers.I now understand that there is a bias against both genders shown in STEM college classes, and incredible discrimination against women in STEM workplaces.By surveying almost 2,000 people,being rejected several times,and persevering through 6 months of hard work, my project helped me build more social skills and get comfortable in my own skin.This project brings awareness to communities about how to not target the idea that just more females should go into science, but that everyone should

Summary Statement
By online surveying nearly1500 I determined biases do exist for women entering or working in STEM fields;I was able to redirect questions that lead to clarity of experiences in STEM, men and women, varied ages, regardless of education level

Help Received
My parents purchased a membership with Survey Monkey and provided transportation to and from locations for me to distribute my survey.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Jack M. Driscoll-Natale

Project Number
J0406

Project Title
Rockin' to the Beat of History: A Statistical Analysis of 60 Years of Popular Music

Abstract

Objectives/Goals
My goal was to identify specific trends in popular music over the last sixty years that music producers and songwriters could follow to help target their songs for greater popularity and profitability. My hypothesis was that the tempo in beats per minute (BPM) would increase, the amount of self-focused "I/Me/Mine" pronouns would increase, and that songs written in a Minor Key would increase over time.

Methods/Materials
I used Billboard Magazine's website archives of "Top 100" songs to gather my song data. To create a representative sample, I used data from every 5 years and included half of the Top 10 songs from the "Top 100" list. I used the Note Discovery website to find the Beats per Minute (BPM) and the key of each song. I used www.genius.com and www.atozlyrics.com to find the lyrics for each song. Finally, I created graphs using Excel that included trend lines to see changes over time for these variables.

Results
The data shows for thirty years in a row (1960-1990), 80-100% of songs were written in a Major key. That decreased to 60% in 1995, to 40% in 2005, and finally reached an all time low of 20% in 2010. The clear trend shows a current preference for songs written in a Minor key.

The data reveals that the fastest songs each year stayed fairly consistent with an average of 150 beats per minute. However, the slowest songs showed a clear downward trend, dropping an average of 30 BPMs over sixty years.

The data shows an average increase of 30 self-focused pronouns in song lyrics from 1960-2015.

Conclusions/Discussion
Contrary to my hypothesis, current songs are not faster. However, the data shows that today's slower hits have become much slower over time. Today's faster and medium tempo hit songs have remained fairly consistent except for a spike in tempo during the Disco era.

There has been a clear and steady increase in songs written in a Minor key, which I interpret to indicate songs with a more "sad" musical tone over time.

Self-focused pronouns in lyrics have increased by an average of 30 pronouns per song over time, which demonstrates to me that songs are becoming more focused on the self instead of on others.

Summary Statement
My analysis of popular music from the past sixty years shows that slower songs, in a Minor key, with less than sixty self-centered pronouns in the lyrics are currently trending in popularity.

Help Received
My parents helped me to set up the Excel program for entering my collected data and creating graphs.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Mumtaaz A. Elmi

Project Number
J0407

Project Title
What Factors Affect Emotional Intelligence?

Abstract

Objectives/Goals
The objective of this project is to test what of 3 factors(gender, family size, and birth order)affect emotional intelligence the most.

Methods/Materials
50 middle school students,Emotional Intelligence Tests (available online), Computers, Microsoft Excel, Demographic background survey, Lab notebook, and Score Sheets .

Results
The results revealed that kids from a big family had 3.06% higher self- awareness than kids from a small family. Additionally, their relationship management and their social awareness were higher by 1.06% and .92%, respectively. On the other hand, a person from a small family had a 13.46% higher rate of self-management.

Among girls, emotional intelligence results indicated that their self- awareness was 1.22% less than the boys, but their self-management was 10.07% higher. The results also showed that boys were more socially aware by 6.68% than girls, but their relationship management was 10.00% less than the girls.

According to birth order, results showed that for self-awareness, self-management, and relationship management, the last child had the highest and the middle child had the lowest score. As for social awareness, the middle child scored the highest but the first child scored the lowest.

Conclusions/Discussion
In conclusion, when results were compared, it was shown that gender is not a big factor affecting Emotional Intelligence. The results showed that only 1%-10% of the difference of the percentage of boys vs. girls affected EI. Other factors, such as big family vs. small family and birth order played a bigger role in EL, ranging from 1%-13%.

Summary Statement
I tested what factors affect emotional intelligence.

Help Received
Majority of my project was done by me but I had some input from my advisor.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Alexander Fan

Project Number
J0408

Project Title
Men vs. Women: A Survey to Find the Gender with the Best Medication Adherence

Abstract

Objectives/Goals
Medication adherence costs Americans around $289 billion a year. Patient nonadherence to prescribed medications is associated with poor therapeutic outcomes, progression of disease, and an estimated burden of billions per year in avoidable direct health care costs. In the United States, medication noncompliance is estimated to cause approximately 125,000 deaths per year and at least ten percent of hospitalizations. It is a rising issue that needs to be solved. In my experiment I hoped to find which gender has the best adherence and what would help patients comply with their prescription.

Methods/Materials
I surveyed patients on their medication adherence, how to improve their medication adherence, and their demographics. I conducted my survey in the lobby of Bakersfield Dermatology. I introduced myself to patients, asked them to participate in the survey, and finally surveyed the patients. After, I reviewed the data and analyzed the statistics using Excel.

Results
Men had a medication adherence rate of 36% while women had a medication adherence rate of 43%. I looked into what respondents felt would help them improve their adherence: smartphone reminder application, pill dispenser, watch alarm, or talking to pharmacist. More women than men thought smartphone reminder applications would help them take their medication (43% of women vs. 29% of men). More women than men claimed a watch with timer would be helpful (19% of women vs. 7% of men). More men than women felt a pill dispenser would help (43% of men vs. 28% of women).

Conclusions/Discussion
My data showed that the women (43%) I surveyed had a slightly higher medication adherence rate than men (36%). But, the difference was not statistically significant enough (P-value=0.82) for me to conclude that on average women have a higher medication adherence rate. A higher percentage of men than women thought a pill dispenser would help them. A higher percentage of women than men stated a smartphone reminder application and a watch with a timer. My data suggested women are looking for reminders and men need more organization for their medications. In the future I would like to create a smartphone reminder application electronically attached to a pill dispenser. By doing this I could provide a tool to remind patients to take their medication and to keep them organized.

Summary Statement
I surveyed patients to discover which gender has the best medication adherence and how to improve adherence.

Help Received
Bakersfield Dermatology allowed me to survey their patients. My teacher helped me turn my data into graphs using Excel. Dr. Sylvia Ta helped guide me on how to create a survey.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

Christopher Hartanto; Naomi Nguyen; Katherine Robertson

Project Number

J0409

Project Title

Electronic Posture Monitor

Abstract

Objectives/Goals

Many people have bad posture, and bad posture can lead to health problems later in life. Our group's goal was to create a light, easy to use, effective and inexpensive posture monitor to solve the need for proper posture.

Methods/Materials

First prototype, main components include Arduino Nano, 1.5-3v motor, L298N motor driver, 9v battery, flex sensor, and rocker switch. The flex sensor's resistance value was read by the Arduino. If the value was greater than a certain amount, the motor activated. The user could feel or hear a vibration whenever they slouched. The flex sensor was secured against the back using an elastic and nylon harness. Second prototype used the same electronics, but replaced the harness with Rock Tape. In the third prototype we replaced the L298N motor driver with the L9110 motor driver, the 9v battery with two CR2450s in series, and the bulky 1.5-3v motor with a small 3v vibration motor. In the fourth prototype we replaced the Arduino Nano with an ATtiny85, the L9110 motor driver with the L293D chip, and the rocker switch with a smaller slide switch. Also added a switch that allows the user to set their target position by pressing it. We added a new feature that allows the user to change the length of the wire to fit their needs. The independent variable was whether we used the posture monitor or not. The dependent variable was the time the user slouched. The control was the test where our user sat down, worked on the computer, and wore the posture monitor; the posture monitor measured the time slouching without notifying the user if they were slouching. After we completed the control, we performed the same test (same user, testing time, activity, etc.), but this time the posture monitor measured the user's time slouching and notified them when they were.

Results

On average, we discovered the second prototype decreased the time slouching by 76%. On average, the third prototype decreased the time spent slouching by 74%. The fourth prototype was not tested. The tests for the other prototypes proved we obtained our objective because our posture monitor significantly reduced the user's time slouching.

Conclusions/Discussion

Our results showed we reached our objective: to create an electronic posture monitor that decreases the user's time slouching. The project uses common electronic components to create a usable device that can help prevent posture problems.

Summary Statement

We created an electronic posture monitor that senses when the user is slouching and notifies them when they are slouching.

Help Received

We designed and built all of the devices. Using STL files that our team provided, our technology teacher 3D-printed cases for our electronic posture monitor.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Gavin O. Jimerson

Project Number
J0410

Project Title
The Association between Cybersecurity Knowledge and Password Strength

Abstract

Objectives/Goals
My question was whether a college students knowledge of cybersecurity would be associated with their password strength. This question is particularly important as young adults use digital technology daily (such as phones, tablets, and computers) and they are establishing behavior patterns that will likely continue into adulthood.

Methods/Materials
I created a survey to collect basic demographic information (5 questions) and to examine a persons cybersecurity knowledge (10 questions) and password strength (10 questions). During a three week period college students were invited via email and online postings to complete each of the survey questions online using a computer, phone, or tablet.

Results
Analyses of the responses from 309 participants (mean age 20.6 years, 54% female) revealed a statistically significant (probability < .000) Pearson correlation (.40) between participants cybersecurity knowledge and password strength. Further analyses of those with high levels of cybersecurity knowledge compared to those with low levels of cybersecurity knowledge demonstrated that those with higher levels of cybersecurity knowledge had statistically significant higher password strength scores ($t = -8.81$, probability < .000).

Conclusions/Discussion
My hypothesis was, If a person has greater cybersecurity knowledge, then s/he will have a stronger password. Data from this study supports this hypothesis. Understanding this positive association between higher levels of cybersecurity knowledge and password strength provides a foundation for further research and practice to build upon. Further emphasis on educating users about cybersecurity knowledge warrants further attention as this may be a means to enhance the use of stronger passwords and provide greater protection for companies, governments, and individuals.

Summary Statement
Using the measures that I developed, my study identified a positive association between cybersecurity knowledge and password strength.

Help Received
My science teacher Mrs. Avers, provided guidance about preparing my science project. UCSB Professor Giovanne Vigna reviewed my survey questions to ensure that the answers were correct and were a good measure of someone's cybersecurity knowledge and their password strength.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Avery P. Kalafatas

Project Number
J0411

Project Title
Who's Happy?

Abstract

Objectives/Goals
The purpose of my investigation was to find which groups of people (age, gender, ethnicity, relationship status, education levels, income, and the number of children in the household) are struggling with happiness. And, to help educate our society on which groups of people are in need of the most love, support, and help.

Methods/Materials
I conducted my experiment by creating a survey of 14 questions from five happiness surveys created by scientists who study happiness and depression levels. I took the questions that weren't as specific to a certain lifestyle because I was testing all ages. It wouldn't be fitting to ask a 13-year-old about their previous career experiences. I managed to get responses from over 1,000 people throughout the United States.

Results
I came to the conclusion that gender doesn't have much of an impact on happiness levels. But, relationship status, education level, income, age, and the number of children in the household do indeed have a great impact on one's happiness. My results showed that widowed people are happier than single, married, or divorced people. This was the opposite of what I hypothesized. I also found that the higher your income rate is the happier you generally are. So, in my project money does buy happiness. And, for all the parents out there, those without children in the household were the happiest group of people. They're happiness scores measured significantly higher than those with children. And, finally, for all the young people, you get happier with age. So, your life will only get better!

Conclusions/Discussion
I found that the people we think are the most unhappy and need the most support are those who are actually happier. Although we shouldn't drop everything and stop supporting widows, older people, people without children, and those with a higher monthly income, we should take some of the love we provide for them and begin to show it towards young people, divorced and married people, and low-income families. These are a few groups of people who are truly struggling in our society today. The people who need the most love and support are often overlooked, causing more unhappiness.

Summary Statement
I found that the groups of people we belive are struggling (widows, older people, divorced people, etc.) are happier than those we think are doing alright (young children, married people, etc.)

Help Received
Adam Dear (working at Research Now) Theresa Hall (School therapist)

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Ty R. Koebler

Project Number
J0412

Project Title
Facial Expressions in Cartoons

Abstract

Objectives/Goals
This goal of this project was to investigate how different regions of the face are important for depicting facial expressions. My investigative question was: Which facial areas are most important for facial expressions? My hypothesis was that the important facial region would depend on the facial expression.

Methods/Materials
Materials: Consent forms; 5 reference photos of the cross-cultural expressions of happiness, sadness, fear, anger and surprise; 5 images drawn from the reference photos; iPad; slideshow of divided faces in random order and full faces at the end
Methods: Forty test subjects were shown sketches of partial and whole faces, which were hand drawn and depicted 5 universal expressions. Subjects were asked to write down the facial expression they saw.
1. Draw faces and prepare slideshow. 2. Make consent forms and answer sheet.
Experiment: 1. Review consent forms with volunteer . 2. Read the instructions. 3. Begin slideshow. 4. Subjects write down the emotion they see. 5. Repeat steps 1-3 with 40 volunteers.
After data collection: 1. Create a synonym list for emotions. 2. Calculate accuracy scores for each drawing.

Results
My results showed that happiness and surprise were interpreted better from the lower half of the face, but anger, fear and sadness were interpreted better from the upper half.

My results support my hypothesis. This project mirrors the findings in a similar experiment that psychologists did with photos. It also provides information for artists who want to know more about drawing facial expressions.

Conclusions/Discussion
This project shows that similar to in photographs, certain facial regions are more important for depicting certain emotions. This project adds to knowledge because as far as I know it was the first time this experiment was performed with drawings. This information can help me and other artists, because it shows what features are important to focus on for different emotions. It is important to get good at drawing emotions because feelings are important in storytelling.

Summary Statement
This project investigated which regions of the face are important in drawing five universal facial expressions.

Help Received
My teacher Amy Schwerdtfeger gave me feedback throughout the project, and my mom Suzanne Koebler helped me recruit volunteers and put together my board.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Sydney S. Lee

Project Number
J0413

Project Title
To Fear, or Not to Fear? That Is the Question

Abstract

Objectives/Goals
The goal is to find out what people fear by filling out surveys about fears, and based on those results, determine if fears change with age.

Methods/Materials
I made a questionnaire based on fears and surveyed 200 willing participants from ages seven to 70 and older. I used about 300 sheets of paper and asked 200 people to fill out the survey.

Results
My results indicate that 67% of the 200 people surveyed had a fear when they were younger, but it had gone away when they got older, which proves that fear does change as people age. Also, 65% answered that they think their fear(s) will change, which correlates to the first question, if they had a fear that changed or had gone away. This clearly shows most people agree that fears do change with age.

Conclusions/Discussion
Fears do change as people age, which was my hypothesis. From all the data I collected and analyzed, it shows that the younger someone is, the more fears they have; and as someone grows older and wiser, they have fewer fears. This project has helped me learn a lot about how different age groups have different fears. The most surprising result was natural disasters, which was the fear selected by most people.

Summary Statement
My project is about what people's fears are and if fears change with age.

Help Received
My science teacher, Mr. Briner, helped me by making sure I was on task every week.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Morgan E. Link

Project Number
J0414

Project Title
Wrap It Up! Investigating the Effects of Age on Responses to Packaging

Abstract

Objectives/Goals
Today's big brands in the food industry use packaging to draw attention to their products and to appeal to the broadest possible base of consumers. For my project, I investigated preferred colors, color tone, and overall designs for the packaging of food products. I wondered whether packaging colors and color schemes might appeal differently to adults, middle school and elementary school children. I believed warmer, brighter colors of packaging would be preferred over other color tones by the majority of test subjects.

Methods/Materials
I tested a total of 235 subjects, including adults and children in grades 3 through 8. I used PicsArt to photoshop images of the packaging for Cheez-its, Cheerios, and Popcorn Indiana Kettle Corn, changing the colors and color tones of the product and background. I created a slideshow from these various images. I prepared a separate feedback sheet and distributed it to my test subjects. I displayed the slideshow and instructed my test subjects to circle the letter on the sheet that matched their favorite image. I recorded and analyzed my results.

Results
Packaging C, with a warm color background for each of the products, was most preferred by all ages. It was chosen by 35% of test subjects overall, including 49% of the adults, 36% of the 6th through 8th graders and 29% of the 3rd through 5th graders. Packaging D, also a warm color, was preferred by 12% of subjects, indicating that warm color packaging options were preferred by a total of nearly half of all test subjects. Packaging A and E, designed with cool colors, were chosen by 26% of test subjects. The white backgrounds of packaging B and F and the mixed colors presented in packaging G were the least appealing options, chosen by only 10% or fewer test subjects overall. When comparing the results by age group, the only consistent selection was the warm color packaging of option C.

Conclusions/Discussion
These results supported my hypothesis that packaging for food products designed with warmer colors might be the most appealing compared to cooler colors, mixed color tones, or white. My results also suggest that packaging preferences vary depending on age. While all age groups chose the warm color as their overall favorite, the preference order for the remaining six varied greatly for each group.

Summary Statement
In my project I tested people in order to find out their color preferences for food product packaging and compared the results according to age.

Help Received
I designed my test sheet and presentation and tested the majority of subjects who participated. My science teacher allowed me to conduct my testing at school in her class and Mrs. Jodi Coe allowed me to conduct my testing on adults at Nuvasive.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Simona E. Michaelson

Project Number
J0415

Project Title
Effects of Visual Stimuli on O.C.D.

Abstract

Objectives/Goals
My objective for this experiment was to examine whether or not organized imagery can help reduce or prevent a panic attack.

Methods/Materials
12 organized pictures,12 disorganized pictures,pre experiment survey,post experiment survey. 45 participants were separated into 3 groups (organized, disorganized, control). Participants in the organized and disorganized group completed half the survey, took the experiment (looked at pictures pertaining to their group), and then completed survey. Those in the control group took the entire survey at once.

Results
According to my data, the participants in the organized group had the lowest stress levels, those in the disorganized group had the highest stress levels, and those in the control group had neutral stress levels. This data leads me to believe that organized imagery can help prevent/reduce a panic attack.

Conclusions/Discussion
The aim of this experiment was to see whether there is any correlation between organized imagery and the calming of a panic attack. After completing my entire experiment and comparing my data I have concluded that organized imagery does in fact lower stress levels. My data has also proven that disorganized imagery boosts stress levels. According to my research, the reason for these happenings are that when the brain feels threatened and the fight or flight response is activated. The disorganized imagery is what is threatening the brain. Contrary to the disorganized images, organized imagery calms the brain because it distracts the brain from the stresser.

Summary Statement
My project monitored how the stress levels in an adolescent brain react to organized or disorganized visual stimuli.

Help Received
I had help from a therapist,Deeann Peterson, who explained to me different ways students may react upon viewing the images. She explained how some may feel uncomfortable but no serious damage would be inflicted.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

Kate Morgan; Julia Vanoli

Project Number

J0416

Project Title

How False Assurance Affects Test Taking Preformance

Abstract

Objectives/Goals

Our question is: How does false assurance affect test taking performance? We wanted to find out if when a student was told they did poorly on a test they would alter their answers on the retake to receive a different score.

Methods/Materials

First, a class had 5 minutes to complete a 16 question test that we constructed from practice standardized tests such as the SAT. When finished, we collected the tests and told them we would grade them. After what they thought was us grading the tests, we falsely told the test group they had a harder version of the test so they did poorly. The control group heard this but was given no information about their test. We told them they all would retake the test. They were falsely under the impression that they had different tests, however, the tests were the same. After comparing the two test scores we recorded the data in our data table. We repeated the same process for the 6th, 7th, and 8th grades.

Results

Our results showed that all of the eighth grade students in the test group changed their answers and half in the control group. Similar results were shown in sixth grade. Our hypothesis was consistent with our data for sixth and eighth grade. However, 7th grade's data was not consistent with our hypothesis. In total an average of 77% of the students in the test group changed their answers and only 53% of the control group changed their answers.

Conclusions/Discussion

We created a basic experiment that could be easily branched off of to determine data for specific aspects of research. With further research test administrators could determine how what they say affects how the student performs on the test. This could lead to more accurate testing and student mindset to improve test scores.

Summary Statement

In order to determine how people react and retake a test after they have been falsely told they did poorly, we decided to test the grades in our school by gathering them into a classroom and conducting an experiment; eventually discovering

Help Received

Our adviser met with us for multiple meetings to organize our schedule and documents. Homeroom teachers of the classes we tested helped us proctor during the experiment.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

Anna L. Munoz

Project Number

J0417

Project Title

Reward vs. Punishment: Which Is a More Effective Motivator?

Abstract

Objectives/Goals

The purpose of my science fair project was to find the most effective short-term motivator between punishment and reward. This is an important subject as motivation is used daily to convince oneself and others to complete tasks.

Methods/Materials

Three groups of twenty people with Informed Consent were tested; all groups were asked to cut as many one by one inch paper squares in one minute. Then, each group repeated the task with a different motivator to improve: one used a disgusting smoothie as punishment (just for show- nobody drank it) if they didn't, one had three candies as reward if they did, and the control group did not receive anything.

Results

I measured how much each subject improved. The data sets had outliers, so median was used as the data summary instead of average. The punishment test group had the highest median improvement, 9.5 squares, and highest median percentage increase. In comparison, the reward and control groups' stats were 8.5 squares and 50%, and 8 squares and 35.4%, respectively.

Conclusions/Discussion

While any motivator made a significant difference in how well subjects performed, there was only a small difference between punishment and reward, leaning in the former's favor. This may affect how one decides to motivate either themselves or others: they can use the small boost that punishment gives or apply the more ethical option, reward.

Summary Statement

By analyzing subjects' improvement between two rounds of cutting out paper squares, I found that punishment is a more effective motivator than reward.

Help Received

I designed and performed the experiment myself. Zoe Liberman and Vanessa Woods at the USCB Psychology Department taught me about motivation and its real world applications. Deirdre Li, Jen Checchio, and Juri Holmes at Foothill Elementary School let me use their classes as subjects.

Name(s)
Braden Nucum

Project Number
J0418

Project Title
Excessive Use of Social Media: Do Teenagers Excessively Use Social Media More than Younger Children and Older Adults?

Abstract

Objectives/Goals
The objective of my project is to determine whether people are excessively using social media. I hypothesized that teenagers would excessively use social media more than younger children and adults because younger children are monitored more than teens and adults have more responsibilities. Furthermore there are possible neurobiological reasons why teenagers could be excessively using social media. One study conducted in teenagers at UCLA showed that the nucleus accumbens, which is part of the reward circuitry, is activated during social media use. A different study found that during adolescence the nucleus accumbens becomes highly sensitive and the prefrontal cortex, which controls impulses, is not fully developed.

Methods/Materials
I made a questionnaire based off of the nine criteria for a proposed Internet Gaming Disorder in DSM-5. I simplified the wording of the criteria so that younger children could understand the questions. I tested my questionnaire's validity with a think-aloud test. After obtaining informed consent, I surveyed 426 participants in the community from the different age groups (12 and younger, 13-18 years old, 19 and older). If any participant answered yes to five or more of the criteria, I considered them an excessive user of social media.

Results
I found that 21.5% of the younger children, 27.5% of the teenagers, and 20% of the adults excessively used social media. I performed an ANOVA test to determine if the differences between my groups weren't by chance. With the ANOVA test I found that my data was statistically significant (p-value = 0.000151)

Conclusions/Discussion
My results support my hypothesis that teenagers excessively use social media more than younger children and older adults. My data supports the creation of a Social Media Disorder and spreads awareness of how social media could be used excessively. This study may prompt people to monitor their children's and their own social media use.

Summary Statement
I found that teenagers excessively used social media more than younger children and adults.

Help Received
My mom and brothers helped me recruit participants to complete the surveys. My dad helped me analyze my data.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Anna I. Nunez

Project Number
J0419

Project Title
Education and Exposure to Overcome Medical Phobia

Abstract

Objectives/Goals
The objective of this study is to determine the effect of education and exposure on stress levels, as measured by blood pressure.

Methods/Materials
One sphygmomanometer, two full body Tyvek biohazard suits, safety goggles, face masks, latex gloves, two volunteers , and 7th and 8th grade male and female test subjects with consent forms. Took preliminary blood pressure. Gave half the subjects education and exposure to the Tyvek biohazard suit and procedures. Blood pressure taken again with volunteers in full protective gear.

Results
When blood pressure was taken by volunteers in Tyvek suits, nearly all test subjects blood rose. A single session of education and exposure had no effect on blood pressure.

Conclusions/Discussion
Limited education and exposure revealed no statistical difference on blood pressure. All test subjects showed stress. It is concluded that the amount of education and exposure was not sufficient to have a significant effect on test subjects.

Summary Statement
As measured by blood pressure, I found that a single exposure to biohazard suits and education in their use did not reduce stress levels in test subjects.

Help Received
I developed the idea by myself after watching a documentary by Samaritan's Purse, a humanitarian aid organization. My science teacher gave me materials and access to test subjects.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Sarah D. Paredes

Project Number
J0420

Project Title
Now You See Me, Now You Don't

Abstract

Objectives/Goals
The objective of this study is to determine whether people more proficiently recognize faces of their own race or those of others.

Methods/Materials
40 subjects, 8 different pictures of people per race, index cards, stopwatch. Subjects were tested in two sessions with a period of at least two days in between. Subjects were asked to indentify their own race. Four pictures were given to them to look at for 1 minute. Then I would mix the original four with four different pictures and ask the subjects to identify the original four. Once recorded the result, subjects would be asked to identify the original four again betweem the next 2-3 days and record the results.

Results
The result of both the first and second sessions was recorded. The scores for the sessions showed that 42.5% of subjects only recognized their own race, 35% recognized both, 17.5% only recognized another, and 5% didn't recognize either. This showed that people were most proficient in recognizing only their own race faces.

Conclusions/Discussion
The results supported my hypothesis that people would more easily distinguish the faces of those of their own race than those of others. The subjects mentioned that if I were to do tests over the course of different days, it would alter my data tremenously. Therefore I changed my procedure to have two sessions over the course of multiple days. At first my data supoorted that people both could recognize both their own race and those of others, but after changing my procedure it was clear that my data supported my hypothesis. Knowing that people do more easily recognize the faces of their own races better than those of others, we can now expose our young to more races. Doing so, they can be accustomed to seeing other facial features that come with different races.

Summary Statement
I showed that people more profitiently recognize the faces of their own race, than those faces of another race, using pictures to test subjects.

Help Received
I performed the experiments myself. I got help from my science teacher, with organizing the way I was going to explain my experiment, in order to make understandable to others.

Name(s)
Amanvir S. Parhar

Project Number
J0421

Project Title
Don't Let the Blue Light Bite: The Effect of Blue Light on REM Sleep

Abstract

Objectives/Goals
This project aimed to determine if exposure to blue light through screen time had any impact on the rapid eye movement (REM) sleep or the mood of a human sleeper.

Methods/Materials
Two Fitbit Alta HR devices, two Handheld devices with Fitbit app to collect sleep data, and a pair of Blue-light Filter Glasses. Fitbits were used to collect information on the various stages of sleep, with and without the use of Blue-light filter glasses by the participants during their exposure to electronic screens before they went to sleep.

Results
10 human subjects participated in the research. Exposure to blue light shortened the percentage of their REM sleep. The average of REM sleep for the blue-light exposure group was 21.19% of the total sleep, while the average for the non-exposure group was 23.11%, a difference equal to approximately 8 sleeping minutes. The mood, which was a potential risk during exposure testing, was, on the scale of 1 to 5, higher for the non-exposure days with an average of 4.50, slightly topping the exposure average of 3.81. The control group days were lacking about 2% of their usual REM sleep, and had a higher percentage average for the awake time (15.58%). The non-exposure tests had a decreased awake time percentage (13.43%). The data suggests that the REM sleep was compensated for awake time during exposure, and not all sleep stages were shortened by blue light.

Conclusions/Discussion
The results showed that the blue light exposure lessened the REM sleep by 2%, and caused corresponding increase in the awake time during sleep. I concluded that the blue light does negatively affect the REM quotient and the mood of a human sleeper.

Summary Statement
I found that the exposure to blue light through electronic screens before sleeping negatively impacts the REM quotient and the mood of a human sleeper.

Help Received
My elementary school science lab teacher Mr. Clyde Mann helped me come up with this interesting project idea during our science discussions.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

David B. Rooney

Project Number

J0422

Project Title

The Influence of Athletes' Assumed Race on Perceptions of Potential Success

Abstract

Objectives/Goals

The objective of this study was to determine if a high school athlete's assumed race, using name as a proxy for race, would influence subjects' perceptions of his potential success in college and professional sports.

Methods/Materials

Two online surveys were distributed to adult subjects. Each survey had two stories about high school athletes. After reading the stories, subjects were asked how strongly they agreed or disagreed that the athlete would be recruited to and succeed in college and professional sports. In Survey A, the first story featured a talented high school basketball player named Jake (assumed to be White), and the second story featured an average high school football player named DeShawn (assumed to be Black). In Survey B, the first story featured a talented high school basketball player named DeShawn, and the second story featured an average high school football player named Jake.

Results

In 6 out of 8 scenarios there was a difference in the percent of respondents who strongly agreed or agreed about which athlete would be successful. Overall respondents had more confidence in DeShawn's potential to succeed in athletics than Jake's.

Conclusions/Discussion

This study confirmed past research showing that Black individuals are perceived to be more likely to succeed in sports than White individuals. This research showed that this is true even when race is not explicitly stated. Although the stereotype of Black individuals being more athletic may seem positive, all stereotypes have negative impacts. Interventions are needed to make people aware of their biases and to educate them about the harmful effects of these biases.

Summary Statement

I showed that Black athletes are perceived as more likely to succeed than White athletes when rnames are used as a proxy for race.

Help Received

I received help in designing my surveys and analyzing data from Corinne McDaniels, PhD, MPH, CHES, Director of the Institute for Public Health, San Diego State University

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Abigail P. Rosado

Project Number
J0423

Project Title
The Pressure to Fit In: Testing Conformity in Middle Schoolers

Abstract

Objectives/Goals
The purpose of this experiment was to test how different genders, ages, and grades reacted to being influenced to choose an incorrect answer. The hypothesis was that when influenced, females would be influenced more than males, younger subjects would be influenced more than older subjects, and sixth grade subjects would be influenced.

Methods/Materials
The experiment was conducted by asking a test subject to participate in a "visual perception test". The test was comprised of six different large cards, each with a single line on one half of the card and three lines on the other half. Only one of the three lines matched the first line. The goal of the test was to select which of the three lines matched the length of the first line. In each test the test subject was joined by four of my assistants who were posing as test subjects. For each card the group was asked to select the correct answer. The assistants attempted to influence the test subject to answer incorrectly for three of the test cards. I recorded whether the test subject answered correctly or incorrectly, and repeated this process for all test subjects.

Results
The results of this experiment were that overall, the test subjects were influenced to answer incorrectly, the males were more influenced than females, the older subjects were more influenced than younger, and the seventh graders was more influenced than the other grades.

Conclusions/Discussion
My hypothesis was not supported because the seventh graders were most influenced, males were influenced more than females, and older age students (14) were the most influenced. My conclusion is that people should be aware of how common peer pressure is, and how easy it is to influence people into doing something wrong or incorrect, even if the question/decision is simple and answer is almost clearly stated.

Summary Statement
I found that middle school students were influenced by peer pressure to answer incorrectly, even when the correct answer was obvious.

Help Received
Mrs. Meza is my science teacher and was my advisor throughout the experiment.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Ainsley E. Savant

Project Number
J0424

Project Title
Motivation vs. Actual Energy

Abstract

Objectives/Goals
The objective of this study was to measure motivation and actual energy to see which drives young children and young athletes to succeed during performance.

Methods/Materials
1st-3rd grade boys and girls, competitive boys hockey team, stopwatch, apple juice, food colored water, running track, hockey warmup area. Measured timed running tests with control lap, apple juice lap, and motivation lap (special water, positive words).

Results
School kids and athletes were both timed in multiple laps. They were tested with an energy drink and motivation. The results showed that athletes respond more to motivation.

Conclusions/Discussion
School aged young boys and girls did not respond to the placebo drink or encouraging words. Measuring young athletes on a team revealed a positive correlation to encouraging words and the placebo drink. The conclusion is that athletes on a team respond to motivation vs. actual energy. It is their brains and competitive nature (and possibly environment) that make them faster.

Summary Statement
After reviewing two sets of young groups, I found that young athletes on a team respond more to motivation vs actual energy.

Help Received
I interviewed a psychologist from the Cleveland Clinic (Dr. Michelle Yourkvitch) regarding the placebo effect. I designed the testing format and materials on my own as well as executing the study project. My teacher, Gena Heins, reviewed the project and prompted me to ask questions to dig deeper into the

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Cecily Jade Stevenson

Project Number
J0425

Project Title
What Will Get a Driver to Come to Stop at a Stop Sign?

Abstract

Objectives/Goals
The objective of this study is to determine which variable (signage, people crossing the street and kids playing or a police car parked on the corner) will make more drivers come to a complete stop at a stop sign.

Methods/Materials
I calculated the number of drivers stopping, rolling through and speeding through a stop sign when different variables were introduced and compared these numbers with the data I collected during the week-long observational study.
Equipment included:
Signage that says drive carefully, look-alike police car, basketball, notepad and pencil, watch and cars
Non-Equipment included:
Kids playing, adults walking their pets, drivers, an older person with a walker, parent with a stroller crossing the street and a four-way corner that has stop signs.

Results
The observational study and variable data showed that of the 32 drivers observed each day (how many went through the stop sign in one hour of observation) only 7 (17%) stopped at the stop sign. With the introduction of variables (one at a time) the number of people that stopped went up to 31%.
The total numbers showed that in the eight days of data collecting, there were 352 drivers observed. Only 75 of these drivers actually stopped at the stop sign, that is only 21%. In other words, the total number of drivers that did not stop was 277 or 79%. More importantly, of the 277 drivers that did not stop 49 drivers sped through (did not change speed) the stop sign. Fourteen percent (14%) of the drivers in my neighborhood did not even slow down at a stop sign.

Conclusions/Discussion
In conclusion, the results of the study, when adding each variable independently, were disappointing because drivers still went through stop signs without slowing down. On a positive note less drivers went through stop signs with the introduction of each variable. The number of drivers that stopped increased from 17% to 31% and the number of drivers speeding through went down from 17% to 6%. I presented my findings to California Office of Traffic Safety and our local city council in hopes that there could be more discussion on making the streets safer.

Summary Statement
I introduce variables to encourage drivers to come to a complete stop at a stop sign

Help Received
None. I designed and introduced the variables myself.

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Haneefah F. Syed

Project Number
J0426

Project Title
It's Time for Waste Loss

Abstract

Objectives/Goals
Is a 2 week waste loss challenge an effective way to promote waste reduction among my family and friends?

Methods/Materials
#Power Point presentation with statistics and facts to motivate participants
#Project Pamphlets with details of challenge
#Items for zero waste kit
#Materials for compost box
#Google Survey
#Brea Landfill tour arrangement, waivers and photo release forms
#Reminder app

Results
A majority of the respondents were female (84%), and were between the ages of 18-65yr (83%). While half of the participants were motivated to start the challenge the other felt they were already applying some of the 5 Rs.
The most applied of the 5 Rs was Recycle and Rot was the least.
Among the weekend challenges, the zero waste kit was made by a majority of the respondents and while most would have liked to make a backyard compost or pit, were not ready at the moment to make one.
Although it was difficult for working individuals to attend the landfill tour, having a video of the tour and sharing details was a learning and eye opening experience for 67% of the respondents. The most effective part of the challenge was making a zero waste kit and surprisingly after 2 weeks of trash trolling, a majority of the participants stated that they would miss the challenge and found it very motivating. One week after the challenge ended while 29% felt they were already being applying some of the 5 Rs the majority (57%) were amazed at themselves for making continued mindful choices.

Conclusions/Discussion
I concluded that the 2 week "Waste Loss" challenge was successful in promoting mindful choices when it comes to waste reduction one individual at a time. To promote the least applied R which is Rot I would like to setup a live demonstration with the group or individually at their homes to start a backyard compost. The Landfill tour was difficult due to staff shortages for the OC waste and recycling center, video is sufficient. I would like to make creative and personalized zero waste kits in the future as it was such an effective part of my challenge.

Summary Statement
Post my two week waste loss challenge, my participants are on track to be mindful consumers and actively practice the 5 R's of zero waste living

Help Received
Staff of OC waste and recycling helped me arrange for a Landfill tour of the Brea Olinda Landfill in Brea, California

Name(s)
Ananya Vinay

Project Number
J0427

Project Title
Testing Effectiveness of Computer Based Study vs. Traditional Methods: Are You Being a Neo-Luddite?

Abstract

Objectives/Goals
The objective was to compare the effectiveness of traditional methods and computer-based methods in the age group 11-14 and see which is more effective.

Methods/Materials
30 vocabulary words with definitions printed on paper, 30 vocabulary words uploaded into website-"Quizlet", cellphone timer, laptop. Recall tested after 30 minutes of studying.

Results
The average score for each group was determined. The average recall score for the typing group was 14.48. The average recall group for the writing group was 13.65. The p-value was 0.53.This shows that there was no significant difference between the rate of recall in the 2 groups. This proves that both methods are comparable . Also since each subject crossed over two different methods of study, the test was not confounded by baseline knowledge or vocabulary level or inherent ability.A subgroup analysis was conducted by dividing the subjects by grade level and gender. The students were divided into two groups: grade 6-7 and grade 8-9. The difference in both groups were analyzed using t-test. There was no difference in delta (change of score) between typing and writing when subgroup analysis was done by gender/age. This further strengthens the proposition that typing and writing are at least equally effective for recall.

Conclusions/Discussion
The results of this study were different from the earlier studies, which showed that writing was better. However these studies were done on older students born between 1970 - 1990. Writing was emphasized more and students were more comfortable with writing and had good handwriting speed. This is probably very important for feature classroom study design and learning as a near generation is more comfortable with computers and typing. This can be extended into study subjects like science, history, and geography which involves more analytical thinking especially when couple with visual and audio aids and see what is more effective. Current generation is more comfortable with typing than writing. It is important to update didactic methods to keep with these changes.

Summary Statement
My study concluded that computer based study methods are at least as effective as traditional paper based methods for the age group 11-14.There was no significant difference between recall rate between either group.

Help Received
NA

CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Eva C. Wilson

Project Number
J0428

Project Title
How Do Phones Affect Your Reaction Time?

Abstract

Objectives/Goals
The objective of this study is to determine how phones affect humans reaction time and how phones alter humans awareness to their surroundings.

Methods/Materials
10 people, timer, ruler, ball. Timed how fast people could react to a ball dropping in front of them when they were calling someone, texting someone, or off their phones completely.

Results
A ball was dropped in front of each of the 10 subjects and they were timed to how fast they could react to it when they were calling, texting, or off their phones. 100 trials were run per category to determine if phones affected peoples reaction time or altered their awareness. The performance of people off their phones was shown to be more efficient than those calling or texting.

Conclusions/Discussion
Repeated trials showed a significant difference between the category of when people were off their phones and when they were texting. It is concluded that when people are physically looking at a phone, they have a harder time reacting to their surroundings leading to their reaction times being slower than those who were calling or those who were off their phones.

Summary Statement
Measured the time it took to react to a ball dropping in front of them while they were either texting someone, calling someone, or off their phone all together.

Help Received
None, I conducted the tests and researched on my own.