CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Amanda C. Belleville

Project Number
S0301

Project Title
Smell Your Way to Better Grades

Abstract

Objectives/Goals
This project was to determine which of the five scents, lavender, vanilla, white musk, lavender, and citrus, would help males and females remember the most amount of words.

Methods/Materials
The subjects were put in a room and given a test of 25 words. No scent was present in this test, this test was the baseline to which all the other tests were compared to. The subjects were given two minutes to study the words, then another two minutes to write down all the words they could remember. When the tests were taken with scents, a jar of the scented oil (either lavender, vanilla, white musk, lavender, or citrus) was put in the middle of the room, and an absorbant fragrance pad was dipped into it and passed around. The scent would be present during both study and recall.

Results
The females responed to nearly all the scents in a positive way. The only scent that lowered the amount of words they could recall was the citrus scent. The three scents that helped the most were the white musk, vanilla, and lavender scent. The lavender scent improved their scores by 43.7%.
The males, however, were the opposite: they did best on the baseline test, the test where no test was present. The scents that decreased their score the most were the white musk, citrus, and lavender scents. The scent that decreased their score most significantly was the white musk scent: they remembered 50.1% less words.

Conclusions/Discussion
The females responded positively to most of the scents that were used, except the citrus. The males responded negatively to all the scents used, including the citrus. The citrus scent appears to have a negative affect on both males and females. Perhaps if different,less feminine, scents had been used, the males would have performed better. I do not believe that males respond negatively to all scents, i think it had to do with which scents were used.
To expand on this project i would use more scents to find one that males respond to in a positive way. I would also use different age groups.

Summary Statement
Do different scents effect males and females ability to remember words positively or negatively.

Help Received
My parents helped proofread my report.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Miraya Berke; Hanna Bliden; Nikki Dance

Project Number
S0302

Project Title
Skin Deep

Abstract

Objectives/Goals
The purpose of this experiment was to determine the effects of physical appearance on personal approachability. We hypothesized that physical appearance would affect people's perceptions of each other and impact their choice of friends, preferred students and potential employees.

Methods/Materials
We selected one boy and one girl and dressed them up in five different outfits, each one based on a stereotypical image. We took ten photographs of each different look. We devised a simple poll to determine which stereotypical image people preferred and identified three subgroups to query: high school students, teachers, and parents. We then asked high school students to review the photographs and choose the person they would most like to have as a friend. We asked teachers which person they would prefer to have as a student. Finally, we asked parents which person they would hire for a job.

Results
Results showed that appearance did affect a person's approachability and that image did affect people's choice of friends, preferred students, and potential employees. Students and teachers preferred one image overall others (T-shirt, jeans, clean-cut, sporty image). Parents preferred the professional image overall others as a potential employee.

Conclusions/Discussion
We concluded that physical appearance and image affected the choices people make regarding friends, preferred students, and potential employees.

Summary Statement
Our Project is about if appearance affects a person's approachability and if image affects people's choice of friends, preferred students, and potential employees.

Help Received
Teachers, parents, and students helped by answering the questions we had about the pictures.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)

Marisa Blume; Brianne Latthitham

Project Number

S0303

Project Title

ADD/Hyperactivity Disorder Treatment via Hemispheric Syncronization

Abstract

Objectives/Goals

In our experiment we tested the effectiveness of Hemispheric Synchronization in the treatment of ADD/ADHD. The treatment should result in a decrease of slow brainwave activity, a stabilization of brainwave variability, and an increase of concentration.

Methods/Materials

·2 ADD/ADHD afflicted children
·NeuroCarePro (version 1.86) Software
·Hemi-sync CD
·Active electrodes
·2 reference electrodes
·EEG equipment
·Headphones
·Reading Materials

Subject 1 is a 13 year-old male, and Subject 2 is 15 yr old male. They were required to discontinue taking any psychostimulant medication that may alter the results. Electrodes were then attached to the C3 and C4 electrode sites. Two reference electrodes were also used. The electrodes were attached to EEG equipment that processes brain activity and relays it onto the computer screen.

A baseline was recorded of each subject's brainwave activity. Brainwave activity was recorded while he focused on the image. Each subject was asked to read a novel while listening the a Hemi-Sync CD,#Concentration#, for 30 minutes. This CD is designed to improve concentration and stimulate 18-24Hz activity in the brain. Then a second 40-second baseline was peformed to gather EEG data post the experiment. Finally, the pre- and post-test data were compared and analyzed by NeuroCarePro.

Results

Our hypothesis was supported by the results of the experiment. Both patients showed a significant decrease in inefficient slow brainwave activity. In addition, the variability of their brainwaves was stabilized.

Conclusions/Discussion

Our data shows that after listening to the Hemi-Sync CD both cases showed improvements in the mean scores of brainwave activity for Subject 1 and reduced variability of inefficient EEG activity for Subject 2. There was a decrease in slow brainwave activity and a decrease in inefficient activity in both the higher and lower frequencies. This results in increased concentration and more efficient brain functioning. This

Summary Statement

This project represents a non-psychopharmacological treatment for ADD afflicted people.

Help Received

The procedures were administered under the direct supervision of Dr. Dan Staso, Ph.D., Clinical Psychologist

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Christina G. Boardman

Project Number
S0304

Project Title
Lemon Aid: Can Lemon Scent Improve How Fast Your Brain Processes Information?

Abstract

Objectives/Goals
My objective was to determine if brain processing speed could be improved if pure lemon scent is administered to grade-school age students. I was also interested to see if there were any differences in improvement between learning disabled and general education students.

Methods/Materials
I administered to students ages 7 to 11 a test to measure brain processing speed. I gave a series of tests, first without and then with pure lemon scent; next without and then with a placebo; and finally, giving the lemon scent first and then removing it. I subjected the tests to statistical analyses. Materials were: multiple tests, pencils, a stopwatch, pure lemon essence, a placebo, and kleenex.

Results
For 100% of tests with lemon scent, in whichever sequence the lemon was given, the students' processing speed improved. In 20% of tests in which only a placebo was administered, students# processing speed declined. Improvement with lemon scent was always greater than improvement shown (if any) with a placebo or because of *learning the test* through repeat taking of the test sequence. Both learning disabled and general education students improved at comparable rates, on average; however, lemon scent brought learning disabled students into the processing speed range of the general education students

Conclusions/Discussion
The results supported my hypothesis, showing that brain processing speed can be significantly improved by administering pure lemon scent, beyond any improvement shown through *learning the test* or from a placebo effect. These results support the growing science of brain functions being explored through fMRIs (functional Magnetic Resonate Imaging); the expanding science of the olifactory function and its relationship to the brain, for which the 2004 Nobel Prize in medicine was awarded; and the important exploration of the brain and learning, especially as affects learning disabilities.

Summary Statement
Brain processing speed can be significantly improved in grade-school-age students when pure lemon scent is administered.

Help Received
Dr. Susan Bookheimer, UCLA Brain Mapping Institute, gave me e-mail advice on reversing test sequencing, and when I visited following completion of my tests, helped with statistical analysis and with information on the olifactory areas of the brain.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Melissa A. Buac

Project Number
S0305

Project Title
Remember Me?

Abstract

Objectives/Goals
My project was focused on which tools would help people remember things best. Through my research on many memory topics, I have found that visuals usually helped a person remember things better than other tools or techniques that were used. Based on this, I formed my hypothesis which states that the poem and images handed to a person to memorize would work better than the other four techniques that I was going to use.

Methods/Materials
As I began to test, I gathered eighteen different subjects and tested them on four different poems. I had six groups where each group had three subjects of different age groups (20's, 30's, and 40's). The six groups were labeled as: Control, Audio, Visual, Mnemonic, Repetition, and Note-taking. Each group was to read the poem given to them and try to use the technique indicated by the group name. I tested all the groups for fifteen minutes on each poem and had each recite the poems to me, while I recorded their scores.

Results
Many did not finish the poem, but they did get at least ten words right in each poem. One person from the 20's age group did very well and almost finished reciting all the poems with most of the correct words. The subjects in the 30's age group had scores in between what the subjects scored in the 20's and 40's age group and the subjects in the 40's age group couldn't memorize as many lines as the subjects in the 20's age group could.

Conclusions/Discussion
Overall, the youngest subjects in their 20's memorized each poem better than the subjects in the 30's and 40's. But each age in the Visual group scored the highest than in any other group with the different tools. According to these conclusions, it shows that the Visual tools worked the best to help someone memorize something and the younger subjects memorized more than the older ones.

Summary Statement
The primary focus of this project is to determine which tool, out of five selected tools, will help a person remember things best.

Help Received
Advisement from Science teacher, Mrs. Zadik; Suggestions from Psychologist, Mr. Ortenberg; Science-related websites from school Librarian, Mrs. Morris; Mother helped arrange pictures on board; Older brother helped buy supplies; All family and friends who participated.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)

Stephanie C. Chang; Jacqueline S. Ho

Project Number

S0306

Project Title

La La La: The Effects of Music on Muscle Strength

Abstract

Objectives/Goals

Our objective was to learn if the presence of music will affect muscle strength and which type of music will have a more positive response: waltz or rock?

Methods/Materials

Twenty students (ten girls and ten boys ranging from 9th to 10th grade) were asked to be our human subjects. We had three trials testing the absence of music, waltz music, and rock music. During each trial, the subject was blindfolded and asked to hold their arm parallel to the ground while holding a 1.5 kilogram dumbbell. A string attached to two meter sticks were used for accuracy. The stopwatch was started when the subject hold their arm out and stopped when their arm falls below the string.

The materials we used were: twenty human subjects, two 1.5 kilogram dumbbells, a stopwatch, rock and waltz music, a CD player, a log book, a blindfold, a digital camera, two meter sticks, and a 180 cm string.

Results

In this experiment the results were quite alike, but rock music had a slightly more positive response on the human subject#s muscle strength. Next was waltz music and then followed by the absence of music. During the rock music trial, the human subjects were able to hold on to the dumbbells on an average of sixty-five seconds. Waltz music came in second with an average of fifty-five seconds. Finally, coming in last, was the absence of music, with an average of fifty-four seconds.

Conclusions/Discussion

Our first assumption was that waltz music will have the most positive response towards human muscle strength while rock will have the least response, and the absence of music will come in between. After our experiment, we concluded that our hypothesis was incorrect. The actual results were rock, waltz, followed by the absence of music. Through our research, we learned that music can affect the rate of our heart beat. Although our research stated that rock music will weaken the muscle strength because of the emphasis on the last weak beat, our experiment proves this idea is wrong.

Summary Statement

Our project is about the effects of different kinds of music on human muscle strength.

Help Received

Mother helped provide transportation to get materials.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Sidney S. Choi

Project Number
S0307

Project Title
Factors that Can Enhance or Degrade Memory

Abstract

Objectives/Goals
The purpose of this experiment is to measure the influence different factors can have on the process of memorizing and recalling word lists.

Methods/Materials
There are three different factors that will be experimented on. In the first, the test subjects will be listening to light rock while memorizing a word list for fifteen minutes. In the second, the test subjects will be taking a 20 minute walk prior to memorizing. In the third, they will eat a variety of fruits for 20 minutes then immediately start memorizing. All three results will be compared to the results in a prior experiment in which the subjects memorize the word list in a controlled environment.

Results
Listening to music during the process of memorization yields results 6.79% worse than those from the controlled experiment. The method in which fruit was consumed before memorizing yielded results almost 10% worse than those from the controlled experiment. Walking 20 minutes before memorizing, however, has yielded results 3.48% better than those from the controlled experiment.

Conclusions/Discussion
Adding factors to the process of memorization can have either an enhancing or adverse effect.
1. Walking before memorizing could increase the concentration of oxygen in blood and thus resulting in higher performance.
2. Listening to music seems to lower the subject's level of attention, resulting in lower performance.
3. Memorizing immediately after eating could cause a drop of blood circulation in the brain, thus resulting in lower performance.

Summary Statement
The purpose of this project is to understand how different factors that can affect the process of memorization.

Help Received
Parents assisted in the poster design. Mr. Marxmiller provided helpful comments and advice. Students and some school staff members assisted as being test subjects. The school assisted me by providing a location to conduct my experiments.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Karina Ciprian

Project Number
S0308

Project Title
Who Is At a Higher Stage of Moral Development?

Abstract

Objectives/Goals
THe objective is to determine the stage o moral development in teenagers and comparison to children.

Methods/Materials
Distribute 50 copies to nine year olds and another 50 to sixteen year olds. Have every individual answer on their own the two short questions.

Results
In question one, where the individual could benefit from the situation, sixteen year olds tended to develop a lower stage than the nine year olds. In queswtion two, where the individual was merely an observer, the sixteen year old and nine year old were at the same stage.

Conclusions/Discussion
In situation one, the nine year old tended to be more moraly developed than the sixteen year old do to their environment and society's values. Younger children are mostly exposed(through media, t.v., school,etc.) to all that is deemed good in society therefore they tend to be more innocent. However, do to their age,
sixteen year old have been exposed to not only the good, but also the evil in society. Because of this, sixteen year olds tend to be more greedy and selfish and this causes their low stage of response. In situation two, both age groups are at the equal stage do to the known fact that it is easier to judge than be judged.

Summary Statement
The purpose is to detrmine whether teenagers are at a higher stage of moral development than children.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Sharya de Silva; Melanie Murphy; Kifah Shah

Project Number
S0309

Project Title
The Effects of Scientific Information Concerning Water Conservation on a Person's Opinions

Abstract

Objectives/Goals
To test how people's daily behaviors will be effected if given a certain amount of information, in this case, water conservation.

Methods/Materials
Collecting data and research on different strategies in which to test a person's daily habits by using a survey of ten questions. We used people, an informational brochure, and two surveys (one for before reading the brochure and one for after having read the brochure).

Results
The majority of the people we tested proved to be willing to change their opinions on water conservation after having been informed about the seriousness of the subject and its effects on the enviornment.

Conclusions/Discussion
We found that people would be willing to help the enviornment if only they were supplied with adequate information and research on that paticular subject.

Summary Statement
We wanted to test people in order to see if they would be willing to help the enviornment if they knew more about that subject.

Help Received
Dr.Macavinta, Dimitri de Silva, Dr. Alou-Hicks, Sinali Tucker, Ms. Preston

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Kim J. Delnegro

Project Number
S0310

Project Title
Brain Food

Abstract

Objectives/Goals
The goal of my project was to see if eating a well-balanced breakfast, as opposed to an unhealthy breakfast or no breakfast, affects an average teenagers math and puzzle skills.

Methods/Materials
Test scores were collected from 20 average teenagers. Ten students ate a healthy breakfast, and ten students ate no breakfast. All twenty students took a math test, consisting of basic algebra problems, and an online 22-piece puzzle, which was scored by time of completion. Scores were gathered and compared between eating and non-eating teens.

Results
My results showed that eating a healthy breakfast drastically increased math skills, but scores varied for the puzzle. Almost 85% of the students who ate breakfast had higher math scores than that of people who did not eat. However, puzzle times of completion varied so I assume that breakfast affects students# puzzle/memory skills in different ways; maybe some people are better at concentrating when they are hungry.

Conclusions/Discussion
After conducting this experiment, I concluded that eating a healthy, well-balanced breakfast is, for most students, the better way to go. On top of increased math scores, eating breakfast decreases irritability and stress, raises metabolisms, and just makes for a happier, more energetic person.

Summary Statement
The affects of eating a well-balanced breakfast on students' math and puzzle skills.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Ilang M. Guiroy

Project Number
S0311

Project Title
Quantitative EEG as an Identifier of Learning Modality

Abstract

Objectives/Goals
In the current educational system, students who are highly modal learners miss out on a portion of their education. One feasible solution offered to this dilemma is for the educational system to adapt to the learning modality of the student with the use of a quantitative measure of her learning modality.

Methods/Materials
This study offers a new method that uses the measure of mental focus while a person is being taught in different learning modalities in order to create a numerical measure using brain waves. Twenty students with a mean age of sixteen were included in the study. Each subject was given an assessment, which stimulated learning in three modalities: auditory, tactile/kinesthetic and visual. While learning, the subject's frontal lobe brain activity was monitored using electroencephalograph (EEG) sensors. Brainwave data were processed in real time by a computer software program using a ratio derived from theta and alpha brainwaves as a measure of mental focus (Quantitative EEG (QEEG)).

Results
In this study, QEEG identified a preferred learning modality 86% of the time indicating that the learning modality of a student can be identified from brainwave activity.

Conclusions/Discussion
This quantitative EEG identifier of learning modality will offer educators a new set of tools to adapt their teaching to match the needs of the students.

Summary Statement
Quantitative EEG can be used to identify learning modality correctly 86% of the time.

Help Received
Lee Learning Center provided sensors and testing site, Linda and Mike Lee acted as sounding boards for ideas, and Dave Murray aided with the statistical analysis.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Anu Gupta

Project Number
S0312

Project Title
Life Without Stress

Abstract

Objectives/Goals
Stress, a part of our daily lives, is one of the main causes of high blood pressure today; it increases our respiratory rate, blood pressure and heart rate. I am evaluating the effect of the Deep Relaxation Technique (DRT) and Music on one#s stress level measured by three factors present in the body: Blood Pressure, Heart Rate, and Respiratory Rate. I will be using cardiac patients, regular subjects, teenagers, and DRT practitioners to test stress reduction. I hypothesized that DRT will be most effective in reducing stress because it is a conscious process and is supposed to relax one#s mind and create delta waves. Music creates alpha, beta, and theta waves; it cannot create delta waves because they have an extremely low frequency which can only be reached by DRT.

Methods/Materials
To experiment I borrowed 5 automatic blood pressure and pulse monitors, recorded my voice doing DRT in a tape, and bought a soothing music CD. I made sure that the music and the DRT were of the same length: about 12 minutes. I used a stopwatch to measure the respiratory rate per minute. For subjects, I went to the houses of people, school, the Heart Center, and yoga classes. At first, my subjects just laid down. This was my control group. Then they took a 20 minute break to walk around, etc. Next, the people listened to the music CD while relaxing while lying down. Here they took a break for about 40 minutes and after that, they listened to the DRT tape. My subjects that I tested fall into four categories: 107 Regular Subjects, 61 Cardiac Patients, 30 Yoga Practitioners, 25 teenagers. Regular Subjects are the people who don#t practice Yoga and don#t have a history of cardiac disease.

Results
Although DRT has led to more reduction in the blood pressure, pulse, and respiratory rate in all groups, the degree of reduction is different. (Exact numbers are on the board.)

Conclusions/Discussion
The data supported the hypothesis. This proves to be beneficial for those currently suffering from hypertension; it will help normal people who constantly carry the load of distress and anxiety (the root cause of high blood pressure) and many other medical problems. Both music and yoga help to reduce respiratory rate but yoga is more effective in reducing the respiratory rate. The same goes with the blood pressure and heart rate.

Summary Statement
My project is a two-year study to determine the effects of Deep Relaxation Technique (DRT) and Music on stress reduction tested by the blood pressure, heart rate, and respiratory rate in the body.

Help Received
Dr. Vinod Kumar M.D., F.A.C.C. let me experiment on hypertension patients at the Heart Center; Dr. Dhaval Buch allowed me to experiment on willing people in his evening yoga class at the temple; teenagers from my Yoga Club at high school participated in my study; my mother helped me put the

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Kristin Hough; Timothy Logan

Project Number
S0313

Project Title
Goldfish

Abstract

Objectives/Goals
Goldfish: the most common pond fish. With all of the many variations is this fish as dumb as commonly perceived? No, new studies have shown that goldfish possess the power to tell time, develop a routine and have a memory of up to three months. In our experiment, we are trying to determine whether or not this new information is correct.

Methods/Materials
Materials: Three Goldfish, Plexiglass, Exactoknife, Spray Paint, Fish Food, Three Container for fish, One Container for maze.
Procedure: Show fish one color and feed them. Show fish another color and don't do anything. Do this three times a day. Put them through a maze after a week. Copy Results. Do this for three more weeks.

Results
The goldfish Yohan, who was trained to associate blue with reward and choose it in the maze, chose blue 75% of the time and chose yellow the other 25% of the time. Paprika, who was trained to choose yellow, chose yellow 37.5% of the time and choose blue the other 62.5% of the time. Joe, our control, or the fish who was not shown either of the colors at all before going into the maze chose blue 35% of the time and yellow 62.5% of the time.

Conclusions/Discussion
Our science experiment had varying results on the different fish. Color association seemed to work on Yohan who choose the correct color 75% of the time. It however, did not work on Paprika, who seemed to develop an aversion to the color she was trained to associate with rewards. This could be for varying reasons, either she was scared of the color, or she just liked blue better, for both Yohan and Paprika choose blue the most. However, Joe discourages that theory because he chose yellow more than blue with no training. Both Yohan and Paprika did better with time and repetition and on their lost run-through Yohan and Paprika chose the correct color 100% of the time.

Summary Statement
We trained goldfish to associate color with good and bad.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Caitlin A. Killmer

Project Number
S0314

Project Title
Visual Perceptions and Handedness

Abstract

Objectives/Goals
The goal of my project was to determine if there is a correlation between handedness and the way one interprets a picture. I wanted to prove my hypothesis, which was that left-handed individuals would be more likely to pick a #sensitive# interpretation than right handed people were, and that right-handed people would be more consistent in the interpretation that they chose- essentially, that there would be more continuity among righties than among lefties.

Methods/Materials
I tested approximately 30 subjects by showing them Thomas Cole#s #The Oxbow# and having them choose the interpretation that best matched their own personal interpretation, from a total of three possible interpretations. The three possible interpretations were all written by me, and are all subjective. I consider the first interpretation to be the most traditional, the second to be somewhat pessimistic, and the third to be very sensitive and optimistic. After testing, I tallied the results.

Results
I found that of the three left handed subjects, two identified best with the second interpretation, and one identified best with the third interpretation. Of the twenty seven right handed subjects, 7 best identified with the first interpretation, 9 best identified with the second interpretation, and 11 best identified with the third interpretation.

Conclusions/Discussion
My results are inconclusive. With such a limited sample size, I am not able to draw any real conclusion from my data. However, I believe that with further testing, I may be able to prove my hypothesis.

Summary Statement
My project tests whether handedness is related to visual perceptions.

Help Received
Brother helped make header board and titles.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Marci O. Kirchberg

Project Number
S0315

Project Title
The Dangerous Link between Tasting Abilities and Smoking Tobacco

Abstract

Objectives/Goals
The objective of my experiment was to determine if a person's genetic tasting abilities affect their decision to smoke tobacco.

Methods/Materials
Forty-three human subjects were surveyed on thier tasting abilities and smoking habits. The subject's status as a super taster, normal taster or non taster was determined by thier ratings of a number of taste papers (PTC, thiourea, sodium benzoate) and the number of fungiform papillae on a known area of the tongue. A q tip was used to dye the tip of the tongue with blue food coloring. A hole was punched in a note card and placed on the tongue. A magnifying glass and flashlight were used to count the papillae in that area. A confidential survey concerning smoking habits was administered to the subjects.

Results
Of the smokers, 28% were super tasters, 40% were normal tasters and 32% were non tasters.
Of the non smokers, 45.4% were super tasters, 45.4% were normal tasters, and 9.2% were non tasters.
A Chi-square analysis comparing tasting ability and smoking habits produced a value of 2.355 with two degrees of freedom. (not significant)
A Chi-square analysis comparing tasting ability and rating of the taste of smoking tobacco produced a value of 8.42 with 6 degrees of freedom. (not significant)

Conclusions/Discussion
According to my statistical analysis, there is no correlation between a person's genetic tasting abilities and their decision to smoke tobacco. This leads me to believe that other factors, such as culture, religion, social pressures or medical background, must play a larger role in a person's decision to smoke tobacco.

Summary Statement
My project explores the relationship between genetic tasting abilities and smoking habits.

Help Received
Parents helped gather data and create display

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Adrienne Y. Lee

Project Number
S0316

Project Title
The Effect of Suggestion on Human Memory

Abstract

Objectives/Goals
The objective was to determine of suggestion can distort a person#s memory of a picture (called the suggestibility effect), if source-monitoring tests can reduce that effect, and if gender plays a role in how much a person is affected. The suggestion in this case was written misleading information given to the subject about what he or she had seen.

Methods/Materials
Informed consent was obtained from 52 randomly selected 7th grade girls and 52 randomly selected 7th grade boys. Each subject was given 20 seconds to view a picture taken from an Ikea catalog. Within each gender group, half the subjects then read a narrative describing the picture that included objects not present in the picture. The other half read a control narrative that was a straight description of the picture. Within each experimental and control subgroup, half the subjects were then given a basic yes/no response memory test while the other half were given a special source-monitoring memory test. Tests were analyzed using Microsoft Excel to determine how likely subjects were to think they remembered objects not present in the picture they viewed.

Results
Overall, subjects that were misled that took the yes/no test were more likely to mistakenly #remember# objects that weren#t present in the picture ($p<0.03$) than control subjects that took the same test. Girls were more likely to be misled than boys. The source-monitoring test sharply reduced the suggestibility effect overall ($p<0.3$), to the point where the control boys appeared to be more easily mislead than the experimental ones. Results were analyzed using a t-test.

Conclusions/Discussion
The results generally supported my hypothesis that suggestion does affect the memory of humans. They also supported the case for source-monitoring tests, which reduce the effect of suggestion. In addition, it appears that girls are more susceptible to the suggestibility effect than boys, which may be because females remember differently than males. This experiment raises questions about how questioning eyewitnesses during a trial can possibly adversely affect their memory of what they saw.

Summary Statement
This project tests whether there is a suggestibility effect, whether source-monitoring reduces that effect, and whether the effect differs between the genders.

Help Received
None

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Jennifer Lee; Shain Neumeier

Project Number
S0317

Project Title
Human Asexuality

Abstract

Objectives/Goals
The objectives of this project were to establish trends and common traits among asexuals, to examine possible causes, and to debunk or uphold commonly-held beliefs about asexuality and its causes.

Methods/Materials
Since large amounts of prior research and face-to-face contact with such a small group of people was out of the question, we relied on online polls, surveys and articles and studies done. The computer, therefore, was the only tool needed for research.

Results
While common assumptions made about asexuality's causes were proved to be partially and sometimes entirely untrue (i.e., religious celibacy, bad family life, marijuana use and low self esteem), other factors that are extremely rare in the general population, such as high IQ, Asperger's Syndrome and intersex (being biologically neither male nor female) had a relatively high frequency worth further study, according to polls and surveys.

Conclusions/Discussion
Though establishing cause-and-effect relationships between asexuality and the factors tested was impossible given the methods available for research, astounding correlations were found, while several factors that would seem to be important in terms of their effects on asexuality were not. Further research into the subject could not only provide more knowledge about (what causes) asexuality, but also bring new knowledge about related subjects like high-functioning autism and gender identity.

Summary Statement
This project examined an approximate 1% of the population who has no interest in sex, specifically examining why that is, and establishing what factors do and do not play a role in lack of sex drive.

Help Received
Shain's mom helped with gluing and cutting materials for the board.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Gaby V. Lion

Project Number
S0318

Project Title
The Effects of the Lunar Cycle on Rates of Fatal Car Accidents

Abstract

Objectives/Goals
There are many superstitions and beliefs that there are, in fact, more car accidents during a full moon. I evaluated whether the moon's effect on drivers is just a myth or actual truth by analyzing data collected from fatal passenger vehicle accident reports to the California Highway Patrol.

Methods/Materials
To complete this experiment, I analyzed data of car accidents during these lunar phases: new moon, first quarter, full moon, and last quarter. I also observed the rest of the days of the year as my control group. I obtained data from the California Highway Patrol which included fatal accidents for all passenger vehicles by specific daily dates for the six years from 1998 to 2003. I compared and analyzed this data using different statistical processes.

Results
This data was categorized into full moon days, last quarter, new moon, first quarter days, and the remaining number of days out of the year (or control group). Each moon phase's measures of central tendencies of number of accidents per day, as well as the measures of variation were quite similar. I performed the Chi Square Test on this set of data, which is a form of evaluating and analyzing data to test a hypothesis. It divides the data into various classes and looks at the proportions of those classes compared to the whole population. After performing this test, I could conclude that the probability that the distribution of daily accident frequencies for full moon days is no different than for all days.
I also performed the Unpaired t Test assuming equal variance to help evaluate my data. The Unpaired t Test is commonly used to compare two samples of different size and to test whether these two samples come from the same population. The results from performing this operation provided the conclusion that it is most probable that the moon really has no influence on number of car accidents.

Conclusions/Discussion
After performing many statistical evalution processes which all reached the same conclusion that there was no influence by the full moon on rates of fatal vehicular accidents, I cannot reject the null hypothesis. The full moon has no influence on rates of fatal car accidents, and therefore the urban myth is false. Thus, the illusion of the moon's effect on rates of car accidents is false, and there is no need to fear driving on full moon days.

Summary Statement
I evaluated whether the superstition of the full moon's effect on rates of car accidents was valid by analyzing six years worth of daily data obtained from the California Highway Patrol of fatal vehicular accidents.

Help Received
I received some assistance on statistical evaluation from my father, but I completed the rest of the experiment solely by myself.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Esther Min

Project Number
S0319

Project Title
Arithmetic Differences: Does a Language Affect Arithmetic Calculations?

Abstract

Objectives/Goals
My objective is to investigate whether a language influences the arithmetic performance. The hypothesis is that more complex number structure and more phonemes would lower the performance score in arithmetic calculations.

Methods/Materials
Two sets of test questions were developed for each level, elementary and high school. Both sets at each level had exactly the same operators but different operands. One set (Type A) had numbers with fewer phonemes and the other (Type B) with more phonemes. At elementary schools, 176 English-speaking students in USA and 288 Korean-speaking students in Korea participated in this study. At high schools 322 English-speaking students in USA and 488 Korean-speaking students in Korea participated.

Results
The score of English-speaking students is significantly lower than that of Korean-speaking students for both types at the two levels. For Type A test at the elementary school level, the mean score for English-speaking students was 14.6, while the mean for Korean-speaking students was 18.2; For Type B test at the elementary school level, the mean score for English-speaking students was 12.7, while the mean for Korean-speaking students was 17.4. The test scores of Type B test were lower than the score of Type A for both levels in two countries. The differences between Type A and Type B in English-speaking students were larger than the differences in Korean-speaking students.

Conclusions/Discussion
A language affects arithmetic performance. The English number structure is more complex than Korean number structure The English numbers have more phonemes than Korean numbers. English-speaking students experience more difficulty in arithmetic calculation than Korean-speaking students.

Summary Statement
This project studies whether number structure and phonemes of a language influence the arithmetic performance.

Help Received
Teachers of my high school, Daedeok High School, Gyeong-il Girls High School, Mt. View Elementary School, and Dunwon Elementary School allowed classes to take the tests. Ms. Benitez arranged elementary school classes. Dad taught me how to use SPSS program.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)

Zlatko K. Minev

Project Number

S0320

Project Title

The Effect of Alzheimer's Disease on Visual Perception

Abstract

Objectives/Goals

Alzheimer's disease (AD) is one of the most socially significant diseases in older people. The goal of this project is to establish the effect of Alzheimer's disease on visual perception (in particular, on static and dynamic stereoscopic vision and on figure-ground segregation). I hypothesize that AD subjects have a significantly higher reaction time (RT) to the above mentioned categories of visual perception. If the hypothesis is supported, the next goal is to establish whether my stimuli can be a basis for developing a non-invasive visual test for the early diagnosis of Alzheimer's disease.

Methods/Materials

Informed consent was obtained for each participant in the AD-group and in the control group of same average age non-dementia subjects. I developed a novel experimental paradigm and programmed an original set of visual stimuli. To generate the stereoscopic stimulation I used anaglyphic techniques. RTs of the AD-group to each of the visual stimuli was measured and compared to those of the control group. The experimental procedure was absolutely non-invasive: the subject pressed a button once they perceived the stimulus and the reaction time was automatically measured and saved in a data base on the computer.

Results

The hypothesis was strongly supported: The AD group showed much higher reaction times (~500% on average) to my set of visual stimuli in comparison to the control group. The t-test for each experiment confirmed the statistical significance of the difference between the two groups. The results showed that 100% of RTs for AD subjects were beyond the normal RT-range (as determined by the 1% confidence limit).

Conclusions/Discussion

Could my stimuli be useful for AD diagnostics? To my knowledge, this project is the first study evaluating RT in Alzheimer's for the categories of visual stimulation I examined. My hypothesis, that AD subjects will have significantly increased RT under the experimental paradigm I developed, was strongly supported. The results suggest that AD affects those specific kinds of visual perception. Moreover, based on 1% confidence limit for the age-matched control group, I found that all AD cases were successfully classified as being outside the response range for the controls. This indicates that the visual stimuli I designed are a very effective basis for early diagnostic test for AD.

Summary Statement

To establish the effect of Alzheimer's disease on visual perception (stereoscopic vision and figure-ground segregation) and to determine whether my stimuli could be an effective basis for a non-invasive visual test for early diagnosis of AD

Help Received

A consultation about the anaglyphic technique.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Marianna Pogosyan

Project Number
S0321

Project Title
Does Internet Affect G.P.A?

Abstract

Objectives/Goals
This project was done to see if G.P.A is really affected by the time students spend on the internet. If it results to have negative affects on students,maybe students will spend more time on their studies rather than log on the internet and chat, or play games. Maybe, the performed experiment will cause some students to realize not to spend more time on the internet than on studies.

Methods/Materials
A survey was passed out to the 7th and 8th grade students of T.C.A Arshad Dickranian Armeian School, and A.G.B.U Marie Manoogian-Demitrchyan school. The results were than calculated to find the average of the amount of studends spending their time on the internet and the affect that they are getting in their G.P.A. Then the data was seperated into groups to compare the results of the males to the females.

Results
It resulted that males spend much more time on the internet than females do, and they have lower G.P.As than females do. So this means that, Females, who spend less time on the internet have higher G.P.A than the males that spend more time on the internet.

Conclusions/Discussion
males have lower G.P.As due to the amount they spend on the internet daily than the females. So this results that the internet does affect students G.P.As by not spending enough time on the homework givem for them to do daily.

Summary Statement
The project was done to see if internet affects G.P.A, by calculating the amount of time spend daily on the internet and on schoolwork.

Help Received
Math teacher thought me how to do the calculations in order to get my results.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Sarah T. Silverstein

Project Number
S0322

Project Title
A Longitudinal Study of Stress in First Year Dental Students

Abstract

Objectives/Goals
Life changes and daily hassles lead to stress which can negatively affect performance and health. This longitudinal study examines change in stress over time in first year dental students at four US schools. It is hypothesized that the sources of stress will change over time and that stress will increase.

Methods/Materials
12 dental schools were contacted; 4 participated. Students completed a survey with the Dental Environment Stress (DES) questionnaire, Perceived Stress Scale (PSS), a stress rating and demographic questions at the start of school (Time 1) and 11.7 weeks later (Time 2).

Results
Of 407 first year students, 397 (97.5%) completed least one survey; 212 (52.1%; n=130 men, n=82 women) completed both. Average age was 24.6. Stress ratings for DES items related to school work and lack of relaxation were high at Time 1and increased significantly at Time 2 (ps<.0001). DES items related to school atmosphere had low stress ratings at Time 1 but had large increases over time (ps<.0001). Personal factors had low stress ratings both times. All three stress scale scores increased over time (DES t=-5.98; PSS t=-6.26; stress rating t=-6.14; ps<.0001). Stress scale scores varied (p<.0001) between schools at Time 1, but only small differences remained at Time 2. Stress scores were higher for women, and for younger and single students.

Conclusions/Discussion
My hypotheses were supported. Stress, both general and specific to dental school, increased over time. Sources of stress also changed. Although school work was stressful at both time points, elements in the school atmosphere became important sources of stress over time. Expectations related to teaching approach used at a school may modify initial stress levels but has little effect later on. Gender, age and marital status also affect stress.

Summary Statement
This project examines change over time in stress among first year dental students at four dental schools using multiple measures of stress.

Help Received
Dr. Wotman, Dr. Lalumandier, Mr. Aftoora at Case Western, Dr. Yarborough at University of the Pacific, Dr. Simonson & Mr. Leung at Arizona School of Dentistry & Oral Health, Dr. Shuler at USC administered stress surveys. Dr. Silverstein helped initiate contact. Dr. Kritz-Silverstein taught statistics.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Raquel J. Sojourner

Project Number
S0323

Project Title
Effect of Distractions on Reaction Times of High School Students

Abstract

Objectives/Goals
To analyze how various auditory, visual, and vocal distractions effect the reaction times of high school students between the ages of 14-18. Then comparing these results to teenage drivers versus adult drivers on the road on the road.

Methods/Materials
A student-designed computer program was used to measure each student's reaction time to the one-hundredth of a second.
A Laptop computer was used for all student testing.
Students were always tested in an isolated environment.

Results
Student's reactions times were slowed down by an average of 44% by all three distractions. Each distraction alone, had a significant effect on slowing a student's reaction time down. Yet there was no significant difference between each distraction on a students reaction time.

Conclusions/Discussion
Auditory, visual, and vocal distractions significantly affected the students' reaction times. This slowed reaction time most likely takes place inside of an automobile also. This could contribute to the reason why young drivers are more frequently invovled in present day car accidents.

Summary Statement
The effect of various auditory, visual, and vocal distractions on the reaction times of high school students.

Help Received
Mount Miguel High School provided laptop; A student designed the reaction time computer program; Teacher provided testing environment.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Susan J. Stahlman

Project Number
S0324

Project Title
The Effects of Video Game Play on Blood Pressure and Heart Rate

Abstract

Objectives/Goals
The purpose of this project was to see if playing video games causes a significant change in blood pressure, which theoretically could lead to future health problems. If students get excited about playing video games, then their blood pressure and heart rate could rise.

Methods/Materials
51 subjects, ages 11 to 18, participated in the project. Resting blood pressure and pulse readings were recorded before playing a car racing video game. While racing, blood pressure readings were recorded every two minutes for a minimum of three readings. After the race was over, the subjects' blood pressure and pulse was recorded one more time. A racing average was computed using the last three systolic, diastolic, and pulse readings. Differences were charted between the resting blood pressure and the average racing blood pressure. A control group consisted of 17 subjects whose blood pressure and heart rate was monitored during a non-related, 15-minute rest period.

Results
The average systolic blood pressure dropped 1.3 points from resting to when the participants were playing video games and the diastolic blood pressure dropped 0.1 points, but the average pulse rose 3.0 beats per minute. The control systolic blood pressures dropped 2.6 points, the diastolic pressures dropped 2.4 points, and the heart rates dropped 3.8 points. The increase in heart rate while playing the video game was statistically significant, but there was no significant change in blood pressures between the video game players and the controls.

Conclusions/Discussion
The hypothesis was partially supported. Unexpectedly, both the blood pressures and the heart rate dropped in the control group. In the racing groups, the systolic and diastolic blood pressures also dropped, but not as drastically as they did in the control group; this difference was not statistically significant. However, the heart rates in the racing group rose significantly. Although there was a physiological response to playing the game (heart rate increase), there was not a significant effect on blood pressure. Although there may be other health consequences to long term or very intense video game play, this project did not show that casual playing has a significant cardiovascular effect on adolescents.

Summary Statement
The blood pressure of students, ages 11-18, was tested before, during, and after video game use.

Help Received
Borrowed automatic blood pressure machine from the Edwards Air Force Base Clinic.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Caroline M. Stevens

Project Number
S0325

Project Title
The Effects of Aging and Color on Visual Memory

Abstract

Objectives/Goals
This project explores the impact of aging and color on visual memory. This work was based upon a previous study which I did last year, which concluded colored objects were remembered with more accuracy by young subjects (age 13 to 18). This new study explores whether aging exhibits a similar measurable effect on visual memory. Thus the hypothesis was "The effect of color versus black and white images on visual memory will be more significant among older adults (over 55 years old) than on younger subjects (less than 20 years old).

Methods/Materials
This project used two samples, one young and one old to test the subject's ability to remember colored versus black and white objects. 52 subjects between the ages of 13 and 15 years of age and 26 subjects over the age of 55 were given a test consisting of 31 images. Each was allowed 60 seconds to memorize the objects. An instrument which required identification of previously viewed objects and allowed for scoring correctly remembered items as well as scoring items incorrectly remembered.

Results
The results of the study indicated that while color does enhance visual memory for both older and younger subjects, the effect of aging on visual memory was generally not significant, meaning that the positive effect of color on memory was statistically the same whether it was for younger or older subjects. However, it was true that older subjects made more errors identifying black and white objects than younger subjects.

Conclusions/Discussion
In general, the study results did not support the hypothesis, meaning that age did not have a significant effect on color visual memory. However, there was some support that color increased accuracy of perceptions because the younger subjects made significantly less errors when identifying black and white objects. The significance of these results is that color does enhance visual memory, and even supports the position that color decreases the likelihood of older people misperceiving information. Consequently, color should be used whenever communicating critical information where the benefit of color outweighs the increase in cost of producing color versus black and white visual information.

Summary Statement
Does color enhance visual memory more in older versus younger subjects.

Help Received
Father helped with statistics.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Tiffany M. Tran

Project Number
S0326

Project Title
Cone Cells and Afterimages

Abstract

Objectives/Goals
The objective is to determine if all three different types of cone cells (green, blue, and red light-sensitive pigment cells) on the human retina fatigue at the same rate.

Methods/Materials
Ten test subjects were chosen to participate in the experiment. Three different colored diamonds (green, blue, and red) were prepared out of three different colored papers. The test subjects were then asked to stare, one at a time, at each colored diamond for 10, 20, 30, 40, and 50 seconds. They were then asked to shift their gaze to a white board after each interval of seconds ended. The color, shape, and size of the afterimages seen were then recorded. To measure the fatigue rate of the different cone cells, afterimages were used to indirectly determine the time in which a particular cone cell fatigued. The shortest amount of time that was required to see the correct afterimage was determined to be the fatigue rate for that particular cone cell.

Results
Throughout the experiment, the results showed that the green cone cells fatigued in the shortest amount of time. The average fatigue time of the green cone cells for the test subjects was 18 seconds. The average fatigue time of the blue cone cells was 24 seconds. The average fatigue time of the red cone cells was 28 seconds.

Conclusions/Discussion
Our green cone cells are stimulated the most out of the three, most likely because we are exposed to green everyday. From forests and grasslands to vegetation, almost everything in the natural world is green. If everything around us is green, our green cone cells would be stimulated the most. This may be helpful because as our green cone cells fatigue, the remaining blue and red cone cells are more available for stimulation.

Summary Statement
The effect of different colors on afterimages percepted by cone cells.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Kaitlin M. Walker

Project Number
S0327

Project Title
Big Brother Is Watching You

Abstract

Objectives/Goals
The purpose of my experiment was to demonstrate that a driver's behavior can be influenced by the presence of surveillance cameras. I hypothesized that a smaller percentage of drivers would run red lights in intersections where cameras were present than in those without cameras. This experiment was an exploration of how the presence of red light cameras at intersections deters drivers from running red lights.

Methods/Materials
Over a period of 10 hours (twenty-30 minute sessions), I observed a total of 9,026 vehicles. I divided my observations so that I conducted 10-30 minute observations at a photo-enforced intersection and 10-30 minute observations at an intersection without cameras. I used a tally system to record the vehicles. IV was the intersections with cameras. DV was the drivers that ran red lights. Control was intersection without cameras.

Results
A mean of 1.78% of vehicles observed ran red lights when there was not a camera as compared to a mean of .35% that ran red lights when a camera was present. A total of 105 cars ran red lights, 20 of these were at photo enforced intersections. The range of data for red light running in unmarked intersections was .60% to 3.27%. The range in photo-enforced was from 0% to 1.7%. Drivers were also more likely to enter intersections on yellow lights without cameras, than when cameras were present.

Conclusions/Discussion
Data supported my hypothesis. Based on the data collected during my experiment, the results indicate that photo-enforced lights do serve as a deterrent to red light running behavior, as well as, to running yellow lights. It should be noted that my experiment did not take into account other external variables that might have had an effect on safety such as, weather conditions, driver's emotional state, or situational factors. Futher studies need to be conducted to determine the benefits of camera surveillance as it relates to motorist safety.

Summary Statement
The purpose of this experiment was to demonstrate that a driver's red light running behavior can be influenced by the presence of surveillance cameras.

Help Received
I recruited 3 data collecting assistants for my project

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Toni M. Ward

Project Number
S0328

Project Title
Differences in Personality between Non-Athletes and Athletes and between Athletes Participating in Selected Sports

Abstract

Objectives/Goals
The purpose of this experiment was to determine if there was a significant difference in measures of ambition, perseverance, self-esteem, and power motive between non-athletes and athletes, and also between different sports such as soccer, volleyball, basketball, softball, baseball, football, track/cross country, and cheerleading.

Methods/Materials
118 high school students were tested using a 40-question personality test composed of four different tests published in The Big Book of Personality Tests (Salvatore V. Didato, 2003). The personality traits measured were ambition, perseverance, self-esteem, and power motive. 32 subjects were non-athletes (they did not play any of these sports: soccer, volleyball, basketball, softball, baseball, football, track/cross country, and cheerleading) and 86 subjects played one or more of the sports.

Results
On average the athletes scored 9.25% higher than the non-athletes on the personality test as a whole. According to the data, the athletes# ambition scored 6% higher than the non-athletes# level of ambition. Athletes scored 7% higher in perseverance than non-athletes. The athletes# healthy self-esteem was 17% higher than the non-athletes#. The need for power in the athletes was only 7% higher than the need for power in the non-athletes. Out of the eight selected sports, cheerleading has the highest level of ambition: 27% of the cheerleaders were #intensely ambitious# (they scored 8-10 points on questions 1-10). Soccer had the highest level of perseverance with 20% of the participants who are #very tenacious and work hard to achieve their goals (a score of 8-10 points on questions 11-20). Soccer had 87% of their participants with a #healthy and robust# self-esteem (a score of 6-10 points on questions 21-30). Baseball had the highest power motive: 29% of the participants are #motivated by a compulsive drive for power# (they scored 23-30 points on questions 31-40).

Conclusions/Discussion
The data support the hypothesis: the athletes have a higher ambition, more perseverance, higher self-esteem, and a higher power motive than non-athletes. The results of the experiment can be applied to children: if parents encourage sports participation at an early age, the kids will have a better chance of having more ambition and self-esteem later on in life. This could enable children to be more successful in school and personal goals.

Summary Statement
The purpose of this experiment is to see if athletes are more ambitious, persevering, have a higher self-esteem and higher power-motive than non-athletes.

Help Received
None