CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Rafael Ancheta; Bryan McSweeny

Project Number
S0301

Project Title
Pictures Pumping Blood

Abstract

Objectives/Goals
What types of images convey the emotions that cause consumers to retain the information of a producer's product?

Methods/Materials
Test subjects were tested for average of heart rate and blood pressure before the experiment as to obtain a control for change that was compared to heart rate data at each picture and blood pressure after each series of pictures containing different sets of emotions(happy, sad, etc.). Afterward test subjects were called one week later to find out which pictures they remembered.
Materials
Blind test subjects
Heart rate monitor
Sphygomometer
Stethoscope
Telephone
Slide-show program (power point)
Lysol to sterilize heart rate monitor

Results
Most subjects retained depressing, sad, and scary images in the testing. On the other hand many subjects also retained images that conveyed a happier tone. Still, relative to the neutral pictures the happy and depressing pictures far outnumbered the number of neutral pictures remembered.

Conclusions/Discussion
Relative to the neutral pictures our happy and sad pictures did receive more of a result. We also have reason to believe that the pictures remembered can "speculate that the emotion-memory connection may have evolutionary roots" (Emotions Effect Memory Retention).Implying that more threatening emotions are more important to survival and reproductive success of the species. Although negative responses do have more priority over positive ones, more positive advertising can lead to the consumer actually buying the product.
In relation to heart rate and blood pressure we have found that although response to pictures could be gauged by heart rate and blood pressure it is too inconsistent in relation to memory.

Summary Statement
To observe how different images affect memory retention based on advertising.

Help Received
Used lab equipment from adviser: Sphygomometer, Stethoscope, Labtop, and a controlled room for testing

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Wardah A. Bari

Project Number
S0302

Project Title
Eating Smart for a Healthy Start: Part II

Abstract

Objectives/Goals
The objective is to determine which type of breakfast-high protein, high fiber, complex carbohydrates, junk food, or no breakfast (control) - will help students excel in their studies to maximize capabilities.

Methods/Materials
After gathering about 45 students, I created a two-week diet plan with the consult of a dietician. In the diet plan I included the 5 types of diets being tested: high protein, fiber, junk food, complex carbohydrates, and no breakfast (control). Every morning after eating the breakfast, I would pass out two tests: memory and mental agility (multiplication).
Once the tests were conducted, I graded both memory and mental agility tests every day and entered the results in an excel spreadsheet. I computed the average, median, and mode. For further evaluation, I did statistical analysis using the 2-Proportion Z test. Finally I created graphs comparing the different types of diets.

Results
To obtain the results, the average of the median multiplication and memory scores for each breakfast type were calculated. The overall results were complex carbohydrate- 94%, protein-90%, no breakfast- 90%, fiber-87%, and junk food- 87%. These results were based on a 2-week testing period. For further results, statistical analysis was used to see if there was any major difference in different breakfast types. At a 95% confidence level, we can say there was very slight difference in the different breakfast types and relevancy to the test scores.

Conclusions/Discussion
I surmised that a healthy breakfast high in complex carbohydrates would be the best diet for students to excel in studies and capabilities. Based on my research the glucose found in the carbohydrates is what keeps the brain up and running throughout the day. The memory tests showed that eating a breakfast with complex carbohydrates would increase your memory capabilities. However my hypothesis was not completely correct because on the overall mental agility test, the protein diet was the most helpful. I have come to the conclusion that eating not just one type of breakfast, carbohydrates, but rather mixing with protein and carbohydrates can help a student excel with student capabilities. A breakfast is the complete key to success and to excel in mental capabilities that can help greatly for your long term achievements.

Summary Statement
My project shows the importance of breakfast and its potential to enhance mental capabilities.

Help Received
Consulted Dietitians and Physicians for research: Dr. Sultan Shaw, Dr. Omar Ahmed, Dr. Kelly Ahmed, Dr. Muntir Al-Qasi, Dr. Makiah Al-Qasi; Apple Valley High School Class to conduct experiment, Mrs. Moore-Probability and Statistics AP teacher helped me include statistics in my results.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Nathaniel R. Bohrer

Project Number
S0303

Project Title
Gender Effects on the Perception of Time

Abstract

Objectives/Goals
The objective is to determine how much of an effect, if any, gender has on the perception of time.

Methods/Materials
A random sampling of 50 high school students was taken, equally divided between males and females, and they were asked individually to do two different types of time estimates. The first type of time estimation task consisted of three separate tests in which each person was asked to guess when they thought 10, 30, then 45 seconds had passed. For the second type of estimation, each person was asked to count out 60 seconds three different times. For all the tests a stopwatch was used and the exact times for each subject's response for each test was recorded and the data was later analyzed. Subjects were tested in the same location and environment.

Results
For the "guessing" task, males were closer to the true time than females for all three intervals, although they were not very accurate. The outcome for the second task, the 60 second counting estimate, was that males were on average about 4.5 seconds short of a minute, while females were about 14 seconds short. When a statistical analysis of the data was done, there was a significant difference between males and females.

Conclusions/Discussion
It appeared that males were more accurate at both guessing when an amount of time had passed and counting out a minute, whereas females generally believed that time had passed much faster than it actually had. It appeared that time seems to go by slower for males than it does for females. It also appeared that accuracy increases as the time interval lengthens. Gender did have an effect in this study.

Summary Statement
The purpose of my research was to determine the impact of gender when a subject is asked to estimate time.

Help Received
Ms. Sara Watts provided advisory help and arranged to have her students available as subjects. Dr. Susan Weinshanker provided advice and helped with test times and subject availability. Students at Mission Bay HS participated as subjects. My parents discussed project research and results with me.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Elliot G. Cherkas

Project Number
S0304

Project Title
The Effect of Teaching Methods on Long-Term Memory and Retention

Abstract

Objectives/Goals
By doing this experiment, I wanted to find out which teaching method helped students remember information best in the long-term. I have always wanted to know which way I should study so I can get the best grades in school, and by doing this experiment I will be able to study more effectively and efficiently.

Methods/Materials
I gathered four groups of eight participants each and had them come to a meeting where they were taught information either through visual, auditory, homework or written teaching methods. After being allowed to study the story for thirty minutes, the participants were given a quiz once a week on different days of the week. Three quizzes were given.

Results
By the end of this experiment, I found out that students remembered information the best in the long-term using the written and visual teaching methods.

Conclusions/Discussion
With this data, teachers will be able to choose which method they teach in their classrooms in order to enhance their students learning and helping them remember the data they are expected to learn. According to my data, the written and visual teaching methods are the most effective teaching methods and should be used most often by teachers in the classroom.

Summary Statement
My project is intended to find which teaching method helps children and adults alike remember information the best in the long-term.

Help Received
A mentor helped me create my story and the quizzes I administered to the participants.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Amara Clayton; Jessica Miller; Luis Moncada

Project Number
S0305

Project Title
Which Energy Drink Gives You the Most Energy?

Abstract

Objectives/Goals
Our objective was to learn how human subjects were affected by different brands of energy drinks.

Methods/Materials
Materials: 8 human testers age 13-16, 75 math worksheets, energy drinks. We will have the testers drink several different energy drinks and perform various tests indicating their energy level at several different time intervals.

Results
All energy drinks had a negative effect on the subjects, and the energy levels were all extremely similar before the inevitable crash occured.

Conclusions/Discussion
Our conclusion is that the energy drinks have a negative effect on teenagers and they are definitely not worth drinking when you compare the pros and cons.

Summary Statement
To see which energy drink gives teens with the most energy.

Help Received
Amara's Mom helped to create graphs, Testers volunteered time.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Leif D. Couevas; Skyler B. Triolo

Project Number
S0306

Project Title
Hugs Not Drugs

Abstract

Objectives/Goals
what are the prime condititons for an individual to react positively to a stranger as measured by the likelyness that the given indavidual will hug a stranger

Methods/Materials
go to two types of locations (purpose and leisure) ask individuals for hugs

Results
more hugs at places of leisure

Conclusions/Discussion
an individual will be more friendly in a place of leisure because they have no real reason to be in said area and will be more open to converse and hug a stranger

Summary Statement
what are the prime conditions for people to give hugs

Help Received
transportation provided by mothers

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Alyssa C. Dougherty

Project Number
S0307

Project Title
The Effects of Processing Style on PSAT and GPA Scores

Abstract

Objectives/Goals
My objective was to determine if students(e.g., the apostrophe) processing styles (sequential versus spatial) influence their abilities to achieve high GPAs or to earn high PSAT scores.

Methods/Materials
Informed consent was obtained from 77 students who voluntarily participated in a validated survey to determine each subject(e.g., the apostrophe)s neurological processing style. A school administrator collected the surveys, wrote each subject (e.g., the apostrophe)s GPA and PSAT scores on an attached paper, and then removed the name of the student. These scores were used to determine any correlation between academic achievement and a subject(e.g., the apostrophe)s processing style.

Results
Primary results indicate that sequential processors score higher on PSATs and achieve higher cumulative GPAs, on average, than do all tested subjects. Spatial processors score lower on PSATs and achieve lower cumulative GPAs, on average, than do all tested subjects. This suggests that spatial processors are at a disadvantage in the current educational system as measured by criteria deemed important by schools and colleges (GPAs and PSAT scores). Furthermore, data indicate that highly sequential processors saturate their GPAs more so than predicted by a GPA/PSAT trend-line for all subjects, indicating that highly sequential processors are not challenged enough in the current educational system.

Conclusions/Discussion
This year the National Academy set (e.g., the quotation mark)individualized education(e.g., the quotation mark) as one of their top goals for the next decade. Because processing style does seem to influence academic success, the ability to individualize education based on each student(e.g., the apostrophe)s processing style could be the key to enabling all students to excel at school.

Summary Statement
To determine if there was a correlation between neurological processing and academic achievement, my project involved a combination of surveys, subjects' grades and PSAT scores.

Help Received
Thanks to Mom who performed secretarial duties, Mrs. Pinckney as the school administrator, and Mrs. Lee for mentoring me.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Michael J. Endick

Project Number
S0308

Project Title
Is Your View Askew?

Abstract

Objectives/Goals
The project was designed to test for (and possibly establish) a hypothetical correlation between rotational orientation of a pie graph and the ability to make an accurate estimate of a constant wedge.

Methods/Materials
24 pie graphs were created using twelve sets of constant values, 12 graphs with the starting line aligned with the vertical axis, and 12 graphs with a starting line rotated from that axis. The constant values tested for were the same between the rotated and non-rotated counterpart, but the remaining two values used to make the rest of the pie graph were randomized to ensure no two graphs were the same except for rotation. 20 subjects, 10 from each gender and with a wide age spread, were asked to participate by estimating the constant value.

Results
Values were collected for each entrants individual errors, as absolute values above or below the actual values for each graph, and outliers were removed. These errors were then calculated as an arithmatic mean for each of the 24 graphs, using the results from all 20 participants. When comparing the overall error, nine out of twelve of the constant values had a higher average error when placed in a rotated graph versus a non-rotated graph, supporting the hypothetical correlation between rotation and ease of estimation.

Conclusions/Discussion
The data suggests a correlation between rotation of a graph and its ease of estimation. What can be determined from this is a subconscious preference for an aligned pie graph when attempting to estimate the value of a wedge, regardless of numerical representation. A possible use for these findings may be a method of disorienting consumers viewing the pie graph of a sensitive subject by attempting to make the exact size of a wedge harder to determine.

Summary Statement
I wanted to determine if there was a correlation between the rotation of a pie graph and an average person's understanding of the pie graph itself.

Help Received
Father helped set up Data Collection Table and format score sheets, also helped tabulate data and put into spreadsheets. Both parents helped with layout of final display.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Celine A. Fausto

Project Number
S0309

Project Title
The Improvement of Attention Network Scores as a Result of Visual Training

Abstract

Objectives/Goals
My hypothesis is six to seven year old children in the first grade will show an improvement from their initial Attention Network Test (ANT) scores after two sessions of visual attention training.

Methods/Materials
Materials: 28 children; 14 control group; 14 experimental group; 28 computers; 2 visual attention game websites; "Catch the Lady Bug"; http://www.happy-neuron.com/games/ads.php?gameid=141&screen=1024x768; "Secret Files" http://www.happy-neuron.com/games/ads.php?gameid=77&screen=1024x768; 2 decks of playing cards; "Card Color Call"; Notecards.

Methods: Day 1: Administer ANT to all 28 children (control + experimental) 30 minutes; Collect % mean accuracy. Day 2: Administer "Catch the Ladybug" (game #1) to experimental group 15 minutes; Collect # of ladybugs caught & average response time; Administer "Secret Files" (game #2) to experimental group 10 minutes; Collect % accuracy. Day 3: Administer "Card Color Call" (game #3) to experimental group 10 minutes; Collect # of correct answers. Day 4: Administer ANT to all 28 children (control + experimental) 30 minutes; Collect % mean accuracy.

Results
From the data collected, 71% (10 out of 14 children) of the experimental group, those who received attention training, scored the same or higher in their ANT. In the control group, only 50% (7 out of 14 children) scored the same or higher in their ANT. Moreover, the average percent change of the experimental group was +3.49 while the average percent change of the control group was -0.21.

Conclusions/Discussion
The data analysis and results prove that 6-7 year old children in the 1st grade do show an improvement from their initial ANT score after 2 sessions of visual attention training. The attention training exercises proved to be both helpful as well as entertaining for the children in the experimental group. To further this experiment, different variables can be changed. These variables include age, amount of visual attention training given, amount of time given visual attention training, and time between the initial and final ANT. There could also be a study of the relationship in the percent change in the scores based on the initial scores. A second experiment using the same procedure, but with a different age group could be used to see a comparison of scores based on age. This comparison can also be used to see if attention network increases as age increases.

Summary Statement
This project is to see if children who go through visual attention training for two sessions will show an improvement from their Attention Network Test (ANT) scores after three sessions of visual attention training.

Help Received
Pt. Vicente Elementary School for use of the school's computer lab during school hours; Principal of Pt. Vicente Mrs. Betty Cash for allotment to ask the parents' permission to test their children; First grade teachers of Pt. Vicente: Mrs. Lynda Lubow & Ms. Liz Quinlan for the allotment to use school time in

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Candace Huerta

Project Number
S0310

Project Title
Are You a Mean Girl?

Abstract

Objectives/Goals
My objective was to determine what percentage of teen girls are bullies, bystanders, and victims. My hypothesis was that 60% would be bullies; 30% would be bystanders, and 10% would be victims.

Methods/Materials
I created a survey with a rating of 1 through 5, listing the traits of the bully, bystander, and victims in a question format. Under the supervision of my teacher, Ms. Ventura, 41 teen girls completed the survey on a volunteer basis and anonymously. I then classified the questions into the following categories: passive bully, bully victim, aggressive bully, bystander, and victim. Finally, I calculated the averages and created graphs to show my results.

Results
Of the 41 teen girls, 39% were non-bullies. Twenty-nine percent were bystanders. Seven percent were victims and 15% were bullies. Of the bullies, none fell in the classification of an aggressive bully. Five subjects (83%) were passive bullies. One subject classified as a bully-victim. Out of all the bullies, 66% of the subjects completely denied their bully behavior.

Conclusions/Discussion
According to my data and observations, my hypothesis was incorrect. I hypothesized that 60% of the girls would be bullies; however there were only 15% bullies. The victims surveyed were 17%, higher than the 10% I hypothesized. However, my hypothesis about bystanders was fairly close. I believed it would be 30% and the results were 29%. My project is benefical because it educates people. It put's a magnifying glass on the bullies. The bullies need to recognize their wrong behavior and modify it. Bystanders and non-bullies need to be educated so they can become Victim Advocates. Victims need to be empowered with coping techniques so suicide, depression, loneliness, anxiety, low self-esteem, and behavioral problems resulting from victimaztion will disappear.

Summary Statement
My project was to determine what percentage of teen girls are bullies, bystanders, and victims.

Help Received
My teacher, Ms. Ventura, showed me how to create the graphs; also a statistician gave me suggestions as to how to interpret my data.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Kristen B. McLane

Project Number
S0311

Project Title
An Experiment to Investigate the Effects of Carbohydrates on Spatial Memory Recall

Abstract

Objectives/Goals
This experiment investigates the effects of carbohydrate intake on spatial memory recall. The participants used in the experiment were male and female eleventh and twelfth graders from a rural high school in the northwest United States, all between the ages of 16 and 18. The intent of the experiment is to identify a positive relationship between carbohydrate intake and the ability to recall word placement. It attempts to prove that the higher the intake of carbohydrates, the more likely the participant will remember the placement of different words.

Methods/Materials
The experimental design compares the means of two independent opportunity samples using the t-test. The independent variable in this experiment is whether or not the participants received carbohydrates prior to testing. The dependent variable is the number of correctly placed words.

Results
The t-test did not show significance at the .05 level because the experiment needed to meet the critical value of 1.684. Therefore, the null hypothesis was accepted: There will be no relationship between participants who consume carbohydrates and those who do not when tested on their ability to recall word placement.

Conclusions/Discussion
This determines whether consuming carbohydrates prior to testing improves participation and therefore may be applied to improve testing abilities.

Summary Statement
My project tests the participants' ability to recall word placement depending on the amount of carbohydrates recieved prior to experimentation.

Help Received
Friend presented test to control group.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Ishan S. Puri

Project Number
S0312

Project Title
Lexical Distributions and Electronic Literacy: A Corpus Linguistic Analysis of Textual Richness

Abstract

Objectives/Goals
Little quantitative work has been published on electronic-mediated communication and electronic literacy. This paper hopes to identify the textual richness of representative corpora that will lead to conclusions about the literacy as a whole. My goal is to quantitatively analyze this literacy through the creation of programs written in Python. Regressed Zipfian coefficients, vocabulary size, 4-grams, and hapax legomenon will be analyzed to embody textual richness. With my results, conclusions can be reached regarding the future of language, and the debilitating or regenerative effect of electronic communications.

Methods/Materials
The Python software, SciTE, Microsoft Word, and a personal computer (2GB RAM, 2 GHz) were used. Each corpus was collected from representative, publicly-available online sources and was kept at 50,000 words, in total a collection of a 250,000 words (Blogs-Global Top 100 Technorati, IM-ICQ, Email-Enron corpus, Spoken-Michigan Corpus of Academic Spoken English, Volumes-Harvard Classics). Three Python programs were created: 1. First-order Zipfian coefficients through Levenberg-Marquardt algorithm 2. Vocabulary size and 4-gram distributions 3. Hapax legomenon count. Each corpus was run through the programs in IDLE.

Results
As predicted, in order of lexical richness from greatest to least: Volume, Email, Blog, IM, and Spoken corpus. For H1, Zipfian coefficients, we find -0.91 (Volume), -1.00 (Email),-1.00 (Blog), -1.06 (IM), and -1.19 (Spoken). Lexical richness results follow directly from this data. For H2,vocabulary size: 8,958 (Volume), 8,271 (Email), 7,732 (Blog), 6,712 (IM), and 4,631 (Spoken). The 4-gram results illustrate the standardization of phrases in electronic literacy: 313 (Volumes) and 1,308 (Spoken), and in the electronic: 1,957 (Email), 1,760 (Blog), and 3,204 (IM). Finally we note the hapax legomenon in H3: 5,437 (Volumes), 4,491 (Email), 4,340 (Blog), 3,421 (IM), and 2,377 (Spoken).

Conclusions/Discussion
We conclude that electronic literacy is less rich and perhaps slightly debilitating in terms of vocabulary size. Yet rank-frequency charts amend that this new literacy is not as blunt as some suggest, and that it maintains several features of traditional communication. Therefore we conclude that electronic literacy is rather a hybrid of the spoken and written word.

Summary Statement
Lexical richness of electronic and non-electronic literacy is calculated through the development of three Python programs measuring Zipfian coefficients, vocabulary size and 4-grams, and hapax legomenon.

Help Received
Dr. Stabler introduced me to register and gave me introductory material to read.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Alexander F. Shenton

Project Number
S0313

Project Title
Brand Name or Taste?

Abstract

Objectives/Goals
Do people, particularly teens, judge food on image, brand name and associated price with that name, or do they judge it on how it actually tastes? My hypothesis was that the students will like the food that is labeled as a premium brand name as opposed to the ones that are labeled as generic brands.

Methods/Materials
For my water test I used Fiji water, Kirklands Drinking water, and Larkfield tap water. For my ice cream test I used Ben n Jerry's, Dryers, and Safeway brand ice cream. I also used dixie cups, spoons, paper boats, pens, rating sheets, and picture labels for each brand name. For each freshman advocacy class that was tested I did 3 tests; a traditional blind taste test, a test with the items labeled correctly, and finally a test with the items labeled incorrectly. I also did a survey.

Results
When I tested ice cream, for each test the teenage students gave relatively the same results. However, when I tested the water whatever was labeled as the premium brand was most preferred. Both surveys showed that the premium brands were preferred by most of tested freshman. This answers my objective in that they will judge some "food" by brand name.

Conclusions/Discussion
My results did enable me to meet my objective. I found that when there is a recognizable difference between the brands then the students chose by taste preference. However, if there is no recognizable difference between products the students will choose the product labeled as the premium brand.

Summary Statement
Do teenagers judge food and beverages by brand name or taste?

Help Received
I had to get the teachers' permission to use their rooms;my parents helped me label some of the containers, my mom helped me with Excel and proofreading the report, my dad coached me on my presentation; my Biology teacher set out specific deadlines like a rough draft for my project that kept me on task.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)

Sharona A. Silverstein

Project Number

S0314

Project Title

How Does Volunteering on Humanitarian Missions Affect Pre-Dental Students' Attitudes?

Abstract

Objectives/Goals

This study examines how volunteering on humanitarian missions affects pre-dental students' attitudes. People who volunteer on humanitarian missions have more intense experiences than those volunteering in other circumstances. It is hypothesized that pre-dental students who volunteered on humanitarian missions will have more positive attitudes toward themselves, more caring attitudes toward others and will be more likely to attribute poverty to societal causes than those who did not go on humanitarian missions.

Methods/Materials

Subjects were 123 members of the UCSD Pre-Dental Society (PDS) who completed a survey assessing attitudes toward self (self-esteem, life satisfaction, satisfaction with dentistry as a career, happiness); caring attitudes toward others (empathy, commitment to help others, intent to work with the underserved, and poverty concern); and attributions for poverty.

Results

Age ranged from 18-33 (mean=21.5). PDS members were divided into three groups: NEW members who did not volunteer (N=47), OLD members who volunteered only in free clinics (N=35), and those who volunteered on humanitarian missions (HM, N=41). Comparisons showed significant differences between groups on self-esteem ($p=.01$), life satisfaction ($p=.0004$), satisfaction with dentistry as a career ($p=.002$), happiness ($p=.005$), empathy ($p=.01$), commitment to help others ($p=.004$), intent to work with the underserved ($p=.004$), poverty concern ($p=.003$), and attributions for poverty to societal causes ($p<.0001$). For all comparisons, HM members had the highest scores; NEW members generally had the lowest scores and OLD members were intermediate. Time volunteered was positively correlated with attitudes ($p<.05$). Women had greater empathy ($p<.0001$) and commitment to help others ($p=.01$) than men, but did not differ otherwise.

Conclusions/Discussion

My hypotheses were confirmed. Volunteering on humanitarian missions positively affects pre-dental students' attitudes toward themselves, caring attitudes toward others and their attributions for poverty.

Summary Statement

This study compares pre-dental students who volunteered on humanitarian missions with those who volunteered in a clinic or not at all on their attitudes toward themselves, caring attitudes toward others and attributions for poverty.

Help Received

Father gave me information about humanitarian missions; Mother taught me statistics; Student Director Abel Monzon and Assistant Student Director Joanne Nguyen of the UCSD Pre-Dental Society gave out surveys.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Gautam Tammewar

Project Number
S0315

Project Title
The Effect of Different Types of Background Music on Short-Term Memory

Abstract

Objectives/Goals
"Memory is the potential ability to recall past experiences, or the stored experience, that an individual has at his disposal" (Merit Students Encyclopedia, 1990). Many factors affect how quickly we forget facts, and this experiment will deal with the factor of music. I hypothesize that it will be harder to memorize in the presence of rap/heavy metal, and that it will be easiest to memorize in the presence of baroque music, because it is soft and less distracting.

Methods/Materials
This project was done using 35 people separated into 7 groups of 5. Each group listened to a different genre of music--rap, country, techno, metal, baroque, classic rock, and one control group who listened to no music-- while trying to memorize a set of 20 numbers for one minute. After the minute, they each were given 30 seconds to write as many numbers as they remembered, and these numbers were organized depending on which genre of music was listened to. The numbers in each group were averaged as a percentage of 20 possible numbers to memorize.

Results
The highest average percentage was seen in the metal group with 38% remembrance, then in the rap and country groups with 36% remembrance each, then in the control group with 28% remembrance, the baroque group with 26% remembrance, the techno group with 23%, and finally the classic rock group with 15%.

Conclusions/Discussion
The hypothesis that the group listening to the baroque music would yield the highest average percent was not supported in this experiment. One possible reason for this is that while one tries to memorize a set of numbers with loud metal music, their mind tries harder to block out external distractions, not just the music. Thus, that group could concentrate more on memorization rather than the music. This idea also supports the low rank of the baroque group because the mind would not shut out softer music. Another possible reason is that the subject's taste in music could have affected the results.

Summary Statement
This project's purpose was to find the best musical genre to listen to while memorizing/studying.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)

Michael J. Vredenburgh

Project Number

S0316

Project Title

An Epidemiological Study to Explore the Relationships Among Health Literacy Elements and Their Effects on Comprehension

Abstract

Objectives/Goals

This study is follow-up research from my 2007 science fair study. A primary aim of the current study is to test the extent to which the design of pharmacy medication information (PMI) sheets affects the comprehension of health information by populations who may be at risk of making critical errors: Seniors (65+), new and inexperienced medication users (ages 16-21), and English learners.

Methods/Materials

169 participants (58 male and 111 female) were tested with ages ranging from 16 to 95. There were 41 seniors (65 +) and 40 inexperienced participants (ages 16-21). The English-learners group had 32 non-native English speakers with a variety of first-languages. An experimental information sheet was created for this study by reformatting existing sheets to reflect results from my prior science fair research. A comprehension test was also created for this study. Two existing information sheets (one used by CVS and one by the Food and Drug Administration [FDA]) were compared to the experimental sheet using a repeated-measures ANOVA.

Results

Results show that participants made many critical errors that could potentially result in serious injury or death. The results also indicate that even though participants could view the PMI sheets while responding to questions, their accuracy varied considerably as a function of their population group and format of the PMI used. Results also indicate that the young, inexperienced users and seniors performed significantly better when tested using the reformatted, experimental pharmacy sheet than when using the CVS and FDA sheets. Overall English learners performed significantly lower on the test than the other participants.

Conclusions/Discussion

Overall, these findings demonstrate that the current content and format of medication information sheets should be revised to make the important health-related information contained in these documents more understandable and usable to all population groups. Since seniors use significantly more medications, and the more drugs taken the greater risk of misunderstanding instructions, it is critical that these sheets are redesigned in a format with characteristics similar to the experimental PMI in order to be usable by this population group. This study provides evidence that medication information sheets would be much more useful and likely to help prevent adverse health events if they were written for and tested on a wide range of users.

Summary Statement

This study systematically tests how different formats of pharmacy information sheets, containing the same facts, can affect at-risk population groups' ability to comprehend critical health-related information.

Help Received

Pharmacist Philip Anderson (UCSD) provided pharmaceutical expertise. Michael Kalsher (RPI) helped with statistics and let me collect data in his classes. Family Dr. Randy Cohen provided medical expertise. A senior housing facility allowed me to use their recreation room to collect data.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Vivian Yun

Project Number
S0317

Project Title
Peer Pressure: It's Everywhere

Abstract

Objectives/Goals
To determine which groups of people are easily influenced by peer pressure through the use of a box, a laser, some survey questions; relating to their characteristics that can support the results, and a group of volunteers that are categorized by age groups. My hypothesis is that teens are easily influenced by peer pressure than other age groups due to the transition of puberty.

Methods/Materials
The subjects are to write on a piece of paper whether they believe the laser had moved, or not moved, (movement created with the use of a box and a laser) with and without being influenced by peer pressure. After, they are to answer ten survey questions that are based on their characteristics.
*This project is indeed causing some stress to the participants. However, I have gotten their permissions to progress the experiment. In addition, this experiment does not cause stress to the point where it affects their daily lives. Therefore, this experiment is not fatal in any way.

Results
The analysis shows that preteens are easily influenced by peer pressure than other groups.

Conclusions/Discussion
In conclusion, my hypothesis was incorrect. Nothing is ever done to alter, or prevent peer pressure from occurring because it is so common. However, peer pressure is the reason why such dangerous actions occur every day. Most believe that peer pressure is an ¡°everyday routine¡± that one must occur. This experiment might be the first step in helping those walk away from peer pressure and away from those dangerous actions.

Summary Statement
To determine which groups of people- preteens, teens, or adults- are easily influenced by peer pressure.

Help Received
Mrs. De La Cruz helped with preparations; Mother helped with materials; 6th period Biology class helped with experiments.

CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Xiafei Zhang

Project Number
S0318

Project Title
Discovering the Color Spectrum of Sound

Abstract

Objectives/Goals
My project was to determine how the human brain classified superimposed sound waves # by, conventionally thought, differences in frequency, or by my hypothesis, differences in wave interference.

Methods/Materials
Using music as a vehicle, I tested 20 music-theory-trained individuals on a total of 500 intervals (two notes each) by asking them to guess the names of the intervals I played for them. I recorded what the individuals guessed against what the true interval was. When I organized the data, these intervals were ordered by differences in frequency and differences in wave interference. Whether their guesses were closer to the actual interval by similar differences in frequency, or similar percentages of wave interference, would provide evidence for the method that was used by the subjects to categorize/differentiate the intervals I played.

Results
When subjects made mistakes in their attempt to guess the correct interval, their mistakes were close to the correct interval by wave interference, but when the data was organized by pitch frequency, the graphs showed no discernable pattern. Therefore, the human brain has an overwhelming tendency to categorize their sounds by increasing wave interference.

Conclusions/Discussion
This new found data challenges conventional instruments, written music, and the way music is taught (all with a heavy emphasis on pitch). By figuring out how the brain organizes sound, this experiment basically creates a new color spectrum for sound, able to be utilized by composers and music teachers alike. New, more scientifically based instruments can be created to replace the archaic instruments like the piano, which is organized by pitch. This idea can be applied to other sensations with wave-like properties, such as sensations caused by the electromagnetic spectrum.

Summary Statement
The brain does not, as conventionally thought, classify sounds by differences in pitch, but actually by a spectrum organized by differences in wave interference.

Help Received