CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Kelsey N. Bonds

Project Number
J0301

Project Title
How Age Difference Affects Learning Capabilities

Abstract

Objectives/Goals
The main reason why I conducted this project is because I wanted to discover what happens to your learning capabilities as you grow older.

Methods/Materials
My project's main materials are:
-a vhs or dvd camera
-many participants
-a wide selection of age groups

In my investigation, you first have to begin gathering participants at a random selection. Then, you can begin to perform your test by first making a vhs or dvd of someone clapping hands to different patterns each following pattern increasing in difficulty level. After you have that section completed, you can begin to test your participants by showing the tape. If they receive the pattern correct, they may move on, if not their test trial will be completed. Finally, you can graph your data and results by categorizing the age groups.

Results
After I completed my project, I discovered thatthe average amount accuracy was:
Ages 8-11: 6:10
Ages 12-15: 9:10
Ages 17-20: 7:10
Ages 28-31: 7:10
Ages 42-45: 6:10
Ages 60&up: 5:10

Conclusions/Discussion
In conclusion, I discovered that you do increase learning capability levels, but then you begin to decrease learning capability status at a certain age level.This project will help people discover what happens as you grow older.

Summary Statement
My project is about observing what occurs to your learning capabilties as you age.

Help Received
Coach helped write rough drafts, and she helped improvise my writing. My mother helped me find an area to conduct my project in.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Katherine T. Carter

Project Number
J0302

Project Title
ABC, 123, Which Learning Style Is Best for Me?

Abstract

Objectives/Goals
The objective is to determine whether middle school students can learn information better if they see it first rather than hearing it first.

Methods/Materials
Tested 104 eighth-grade students. Separated them into four groups, two groups were asked to memorize a sequence of ten letters, the other two groups, a sequence of ten numbers. One of the letter sequence groups along with one of the number sequence groups were allowed to hear the sequence before seeing it, the other two groups were allowed to see the sequence before hearing it. All of the students were asked to write the sequence down by memory.

Results
The average percent of correct answers for the students with a sequence of letters which they heard before seeing was 75%. 67.3% was the average percent of correct answers for the students who saw their letter sequence before hearing it. 69.6% was the average percent for the students with a number sequence, which they heard before seeing and the students with a number sequence that was shown to them before they heard it was 56.5%.

Conclusions/Discussion
In conclusion, the experimenter#s hypothesis was proven correct in that the students who heard their sequence before seeing it scored the highest overall. The experimenter also found that students had a more difficult time memorizing the number sequences than the letter sequences. These results are very useful because they show the most effective way to teach middle school students so that we can better help future generations.

Summary Statement
To determine whether middle school students learn better by hearing or seeing information first.

Help Received
Ms. Sondreal, my Science teacher, proofread my papers and helped find subjects to be tested

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Theresa M. Chadwick

Project Number
J0303

Project Title
Mind Manipulation of Students Through Positive Thinking

Abstract

Objectives/Goals

This is a second year study on what effects student's performance. Last year I tested how greatly positive or negative thoughts affected student's grades. Students were told to read a list of positive or negative events before the test. If they got a negative event test they were told it was a very hard test and if they got a positive event test I told them it was an easy test. I found that students who took the positive event test got a higher score than students that took the negative event test.

However, as a future teacher, I realized I will not have much control the positive or negative events that happen to students. So this year I wanted to test how greatly a teacher's positive attitude could influence student test scores without the positive or negative events.

Methods/Materials

I created a test of math, English and science questions for middle school students. 308 tests were administered. A blanket permission form signed by the teachers before the students were tested. During the positive test I said it was an easy test and that they would do well on it. During the control test I did not tell them it was easy but acted disinterested in the test and their performance. The students were given four minutes to complete the test and then the test was collected. Each test was scored.

Results

I averaged the scores for each test and compared them. The positive test received an 8.6% higher score than the control group, which could be the difference between passing or failing a class. This indicates that the teacher's influence is a very important factor in a student's performance. This also means that if you took a test worth 100 questions, just by the teacher's attitude, you could get 9 more questions correct, which is pretty cool if you think about it.

Conclusions/Discussion

There are many factors that influence a student's performance in school. Many of them are beyond a teacher's control such as a student's home life situation, lack of proper nutrition, amount of sleep etc. But inside the classroom a teacher can do small things that have great impact. This experiment showed that the positive attitude of a teacher increases student test scores.

California is looking for ways to increase student test scores. Maybe it's not rocket science, but sometimes it's the simple things, a teacher that genuinely cares about his/her class that can make a huge difference in a student's performance.

Summary Statement

How teacher affirmations towards students effect test scores.

Help Received

All the students who took the test, and my Dad for giving me motivation.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Alexis N. Chasney

Project Number
J0304

Project Title
Musical Stimulation for the Brain

Abstract

Objectives/Goals
My objective was to determine if playing a musical instrument is more correlated with higher IQ than listening to music by comparing test scores between a group that performs a musical piece and a group that listens to a musical piece.

Methods/Materials
Materials:
1. Canon and D on Ipod
2. Canon and D for various instruments
3. IQ and Memory Test
4. Three groups of 4 people

Results
In interpreting my results, it is apparent that the group that performed the musical piece had higher test averages. This leads me to believe that musicians have more active brains than non-musicians. Over time, their brains develop more and give them the capability to become smarter. Studies have shown that the brain#s temporal regions show more stimulation. Musicians have a larger CC that carries information between the motor centers of the hemispheres of the brain. Furthermore, musicians have a more responsive cerebral cortex, which receives sensory input from the fingers. This has all happened after years of playing music. It appeared that the overall educational aptitude of the individual is improved.

Conclusions/Discussion
When performing music, does your brain receive more stimulation than when listening to music? My test results have proven this to be the case. I entered the test scores into a T-test to determine the statistical significance between the groups. On the Memory Test, there was only a 60% difference between groups one and two, a 90% difference between groups two and three, and a 99% difference between groups one and three. Furthermore, on the IQ test, there was a 94% difference between groups one and two, a small 54% difference between groups two and three, and a 99% difference between groups one and three. This proves that there is a correlation between playing a musical instrument and better IQ scoring.

Summary Statement
My project is looking at how music affects the stimulation of the brain.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Benjamin L. Cosman

Project Number
J0305

Project Title
Perception of Randomness

Abstract

Objectives/Goals
How does human perception of randomness compare to real randomness? Can people accurately simulate a string of random coin flips, or will they alternate between heads and tails too often? How does this change with age?

Methods/Materials
Forty-one 5th-graders, 70 8th-graders, and 72 adults (age >=21) pretended they were flipping a coin 35 times and wrote the results as a string of heads and tails. A calculator simulation created 10,030 random strings of length 35 and counted the number of runs (consecutive heads or tails) in each. The runs in the subjects' strings were counted. The means and medians of the subjects and each of the three age groups were compared to the simulation. The mean of each group was compared to that of each other group using Student's T-test, and their variances were compared using the F-test.

Results
Each of the age groups, and the pooled subjects, had higher means and medians (more runs) than the simulation. T-tests showed no significant differences between the means of the three age groups. When variances were compared, 5th-graders had the highest variance (their results were more spread out), 8th-graders had lower variance, and adults had the lowest. All the F-tests comparing these variances showed statistical significance at $p<=0.05$, and the difference between 5th-graders and adults was significant at $p<=0.005$.

Conclusions/Discussion
Children and adults alike have the mistaken belief that a coin alternates from heads to tails and back again more often than it actually does. Adults display lower variance, perhaps because of having acquired a more standardized (and incorrect) notion of randomness. The 5th- and 8th-graders had similar means to the adults, but their higher variances suggested less standardized and therefore more realistic perceptions of randomness. Variance decreases with increasing age, suggesting a uniform and incorrect perception of randomness that becomes more ingrained with time.

Summary Statement
People imagining a coin flip sequence alternate between heads and tails too often, and variance decreases with increasing age, suggesting a uniform and incorrect perception of randomness that becomes more ingrained with time.

Help Received
Dad helped pass out questionaires to adults

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Lauren E. Demos

Project Number
J0306

Project Title
Memory Lane

Abstract

Objectives/Goals
The objective of my project was to determine whether adults remember information better by hearing it spoken, or by hearing it sung in a familiar tune. I believe that the adults will remember the information better after hearing it sung in a familiar tune.

Methods/Materials
Six random combinations of numbers and letters, each consisting of seven numbers and seven letters, were recorded onto a CD. Three of the combinations were spoken and three were sung to the tune of "Joy to the World." Twelve people, six male and six female all between the ages of twenty and seventy-five, had each combination played for them three times. After waiting an additional one minute, each test subjects' memory was tested as they repeated back what they could remember in sequence. Then the results were carefully recorded.

Results
The results showed that, on average, the test subjects remembered the information better after hearing it spoken. The females did better than the males on the spoken segment, but the males did better than the females on the sung segment. Although the test subjects under fifty years of age scored higher on both segments, the test subjects over fifty years of age did significantly better on the spoken segment vs. the sung segment.

Conclusions/Discussion
Results indicated that the test subjects remembered the information better after hearing it spoken rather than sung. Therefore, my hypothesis was not supported.

Summary Statement
My project is about determining whether adults remember information better by hearing it spoken or hearing it sung in familiar tune.

Help Received
My father helped me navigate through Microsoft Excel when I was creating my graphs and data table. I also asked my mother for advice on the layout of my display board.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Michelle J. Dewez

Project Number
J0307

Project Title
Traffic Light Safety and Improvement

Abstract

Objectives/Goals
The objective is to see whether the normal traffic light sequence (green, yellow, red), the blinking yellow sequence (green, yellow, blinking yellow, then red), or the blinking green light (green, blinking green, yellow, then red), can stop vehicles in time.

Methods/Materials
30 subjects of all different ages were tested on a #Body Shaping- Step N# Flex# with the left foot area representing the brake, and a place for your right foot, which will be the accelerator. Subjects were timed from the time the brake touched the floor and the moment the traffic light, displayed on the television set, turned red. Each subject was tested 5 times on each light.

Results
The subject would be tested 5 times for each light. The test had been administered to 30 subjects ranging in age from 6 - 83. The time left over after pushing the brake down fully before the light turned red, and then turning red, would be recorded in seconds. The number of failures was recorded and the number of subjects who fully passed the light was also.

Conclusions/Discussion
The blinking green light does prepare the driver for the upcoming light and makes drivers more aware of the light ahead. The blinking green light has a 10% higher rate of stopping before the light turns red compared to the blinking yellow light and a 23% improvement level compared to the normal light. There were a total of 8 failures with the normal light, 5 failures with the blinking yellow light, and only 2 failures where subjects could not put the brake down before the light turned red with the blinking green light.

Summary Statement
To determine if the normal traffic light sequence (green, yellow, red), the solid then blinking yellow sequence, or the solid then blinking green light, can better prepare drivers for the upcoming light even from a distance.

Help Received
Father helped create single traffic light images that were later made into the "movie" that was used for testing of this project

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Alyssa C. Dougherty

Project Number
J0308

Project Title
Learning Styles

Abstract

Objectives/Goals
My objective was to see if the similarities and differences in learning styles(Tactile Kinesthetic, Visual and/or Auditory) between students and their teachers affect the academic success of the students.

Methods/Materials
6th,7th and 8th grade teachers and their students filled out my learning style questionnaire to determine their learning style and processing style (Spatially, Sequentially, Combination). I analyzed the questionnaires to determine whether the students who had the same learning style as their teachers, generally did better academically than students who had a different learning style than their teachers.

Results
My experiments found that similarities of learning styles between teachers and students did NOT seem to have a great effect on the student's academic success. However, the similarities of processing styles between teachers and students did seem to affect the student's academic success!

Conclusions/Discussion
The match of processing styles seems to matter more in a classroom than the match of learning styles between teachers and students.

Summary Statement
Predicting academic success based on learning and processing styles.

Help Received
I discussed learning and processing styles with Linda Lee at the Lee Learning Center. My Mom helped me stay organized.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Samantha Flattery; Chiara Perez del Campo

Project Number
J0309

Project Title
Can You Believe Your Eyes?

Abstract

Objectives/Goals
The purpose of this this experiment is to find out which is a more effective method of crime solving, eyewitness accounts or handwriting analysis.

Methods/Materials
Materials: Camera, Eyewitness questionarre, Parameter Data Key and Microsoft Excel.

Procedures: First Experiment: Simualtion of Robbery will occur, Mr.Marchetti will be robbed during class, questionarre will be handed out to 10 people at random, Students will fill out questionarre as accurately as possible, questionarres will be graded. Second Experiment: Students fill out commonly used "London Letter" as an exemplar, Exemplars will be analyzed using a Paramter Data Key. Results will be determined.

Results
The final results ended up being that eyewitnesses are sixty percent accurate, where as handwriting anaysis turned out to be 99.9999975% accurate.

Conclusions/Discussion
Handwriting Anlysis is a more effective method of crime solving. As it turns out, I can't believe my eyes.

Summary Statement
The discovery of how effective two controversial methods of crime solving are.

Help Received
David Marchetti helped with the idea for the experiments.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Laura J. Fracchia

Project Number
J0310

Project Title
Josie and the Hypnocats

Abstract

Objectives/Goals
The objective of this project is to find if subliminal messages can affect the brain and its everyday functions. For this project, I predict that subliminal messages will affect about 75% of the participants. The reason behind this prediction was based on historical events. In the early 1900s, psychiatrists used subliminal messages to cure fears and habits. People began to protest because they said that subliminal messages were an invasion of privacy. Subliminal messages must have affected many people, in order to have so many people protest against it. I believe, that the conclusion of this project will show if our society can be threatened by the use of subliminal messages.

Methods/Materials
To begin my testing, I had a person repeat over and over "Pick the green paper", this recording served as the subliminal messages. Then the recording, subliminal messages, was set to a designated volume, so the song and subliminal messages would counteract. A person was then placed in front of a line of papers, with green on the left, purple in the middle, and yellow on the right. What paper color a person picked after listening to the song with and without subliminal messages was compared.

Results
Without subliminal messages, the paper color picked by my participants stayed around the same percentage, with 29% picking green, 34% picking yellow, and 37% picking purple. With subliminal messages the results and percentages greatly changed with 13% of my participants picking yellow, 19% picking purple, and 68% picking green. The dramatic increase in the percentage of picking the green paper, with subliminal messages, shows that our society could be in danger.

Conclusions/Discussion
My hypothesis was very similar to the results. With subliminal messages, I predicted 75% of the participants would be affected, whereas in my project it showed that 68% of the people were affected. In this project I was 7% off in my prediction. This project really opened up my horizons in knowledge about subliminal affect. I think this project is important to the world because it reflects upon our past and our future. Hopefully the proof gained from this project will inspire others to research on this legendary brainwashing technique.

Summary Statement
This project is designed to test if subliminal messages can become a threat to our society by affecting the brains functions and decisions.

Help Received
Mother drove to stores to purchase supplies

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Ben G. Gammage

Project Number
J0311

Project Title
The Least Obvious Choice: Modified Rock-Paper-Scissors as a Testing Ground for the Human Mind

Abstract

Objectives/Goals
My objective was to determine whether, in a two-player zero-sum contest, a player would choose a seemingly more powerful strategy, or select a less obvious strategy, recommended by game theory, in an attempt to outwit an opponent. And which strategy would prove more fruitful?

Methods/Materials
I created a game based on rock-paper-scissors by adding point values, making some options worth more points than others. I then obtained informed consent from pairs of people aged 13 or older. I read each of the players the rules from a prepared rulesheet. Then, each pair played normal rock-paper-scissors 25-30 times, and two different versions of my modified rock-paper-scissors game 25-30 times each.

Results
For each modified rock-paper-scissors game, the choice with the greatest point value was played most often. Also, the winners of each modified rock-paper-scissors game, on average, played the choice with the greatest value the most often and the other two choices fairly equally. The losers in each modified rock-paper-scissors game played, on average, each of the strategies fairly equally.

Conclusions/Discussion
I thought that people would more frequently play the choices worth fewer points to defeat their opponent#s strategy or strategies. This was based on my understanding of game theory and my experience with games. My results did not support my hypothesis. People seemed to jump automatically to the strategies worth more points. They focussed on the more obvious, seemingly more powerful, tried and true strategies rather than attempting to play mind games with their opponents.

Summary Statement
In a two-player zero-sum contest, will a player choose a seemingly more powerful strategy, or select a less obvious strategy in an attempt to trick the opponent?

Help Received
Parents drove me around; father helpd me glue papers to my posterboard; game theory teachers (Chris Stapel and Andy Niedermaier) at Johns Hopkins CTY sparked my interest in game theory.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Miriam L. Gershenson

Project Number
J0312

Project Title
Can Music Make You Smarter?

Abstract

Objectives/Goals
I wanted to find how playing a musical instrument affects logic ability of middle school students. My hypothesis was that there would be a positive correlation between instrumental music experience and logic ability.

Methods/Materials
I obtained informed consent from 68 subjects in grades 6-8. Some subjects were tested in my science teacher's classroom during break; the rest were tested during their social studies classes. Subjects filled out a survey about instrumental music experience, then were given five minutes to complete short logic tests consisting of shape and number patterns. Subjects were not allowed to talk to each other while completing tests. I personally did all of the testing, to make sure that all subjects got the same instructions.

Results
The mean score for subjects that do not play an instrument, or are beginners (one instrument-year), is approximately 5.47. For subjects with two or more instrument-years, the mean score is 6.29. The difference between these is .82, or 8.2%. I did a z-test on the results, and found that they are statistically significant at the 5% level.

Conclusions/Discussion
My results partly supported my hypothesis. There was a large jump in score at two instrument-years, indicating that playing an instrument does increase logic ability. However, average score actually decreased slightly after two instrument-years, although the drop is not statistically significant. My research suggests that it is beneficial for students to learn to play an instrument, and music should be a required part of the curriculum.

Summary Statement
My project is about how instrumental music experience affects logic ability.

Help Received
Grandfather helped find idea; used two teachers' classrooms for testing; parents helped with Microsoft Excel; father and grandfather helped with statistics.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Katharine K. Gifford

Project Number
J0313

Project Title
Information Overload: Can You Multitask?

Abstract

Objectives/Goals
I tested to see whether or not people can multitask and if they can, I want to know how it affects the quality and quantity of their work.

Methods/Materials
Using four similar, yet different tests (they have the same problems in a different order), a timer, speakers, and music, I gave people four tests. The first test, the control test, was taken in silence. The second test wastaken while listening to music. The third test was taken while I had a conversation with the subject and recorded the number of words which they said. The last test was taken while the subject was listening to music and had a conversation with me while I recorded the number of words that they say.

Results
I found that most people can actually multitask, but when talking, males have a greater lack of attention to multiple things. People did the best on test two, then test one, then test four, then test three. There was no correlation between the number of words someone said and how well they performed.

Conclusions/Discussion
I don't think I can say that one gender can multitask better than the other. I do think that certain people can multitask particularly well, but I do not know how to classify these people. It might be interesting to see whether or not age has an impact on one's ability to multitask.

Summary Statement
I tested to find out whether males or females could multitask better and what helped or harmed people's work.

Help Received
Mom helped buy supplies, help with display; Dad helped analyze the data ; Teacher Advising me, gave me time to work on project, help to revise my project

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Anna C. Haines

Project Number
J0314

Project Title
Back Door to the Mind

Abstract

Objectives/Goals
The objective of my experiment was to determine if it is possible to influence a person to act outside of their "normal" behavior. I believe that it is possible to influence people through oral and/or visual stimuli.

Methods/Materials
Permission was obtained from all available second period science teachers. I chose second period because it fulfilled my objective of using the number two as my influenced number. A display board containing the numbers zero through nine randomly placed (with the number two being 1/4 inch larger) was placed at the front of each classroom. A number two pencil and index card was given to each student. An identical speech containing the words two/to/too a total of 11 times was read instructing the students on how to proceed. In my control group, my fourth period science class, a speech was not read, nor did I provide pencils. The same display board was used, replacing the number two with an alternate number two the same size as the other numbers on the display board.

Results
Overall, in my experimental groups, twenty-six percent selected the number two, while twelve percent of my control group selected that number.

Conclusions/Discussion
In the past, there has been considerable debate over the authenticity of the ability to subliminally influence a subject. The data I collected from my experiment supports my hypothesis that it is possible to subliminally influence people to act outside of their "normal" behavior. The potential value of subliminal influence to enhance other methods of behavioral modification needs further examination.

Summary Statement
My project is about whether or not it is possible to influence a person to act outside of their "normal" behavior using subliminal influences.

Help Received
Dr. Lynette Zelezny Ph.D. provided expert advice and guidance, my parents helped assemble my board, and the science teachers at my school for allowing me access to their students.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Marissa M. Hernandez

Project Number
J0315

Project Title
Determining Whether Color Affects Memory

Abstract

Objectives/Goals
My objective to my project is to make it easier for students to study. The easier it is to remember what you're reading the better you'll do on a test.

Methods/Materials
The list of things that I needed to complete my project were twenty-four student subjects, color test sheets(colored papers with five letter words), answer sheets(the page where the student writes down the words), and a stop watch.

Results
My results showed that the boys scored better on the purple and worse on the orange. The girls scored better on the red and also worse on the orange. In total they all did the best on purple and and the worst on the orange.

Conclusions/Discussion
In conclusion the color paper that contains information will most likely affect the amount of information that is remembered.

Summary Statement
My project is about finding out whether colored paper affects the way you remember the information on that paper.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Codi Hirsch; Megumi Tso

Project Number
J0316

Project Title
Snooze or Lose

Abstract

Objectives/Goals
Our goal was to discover if the amount of sleep a person gets effects their ability to memorize and compute problems

Methods/Materials
We chose 4 6th grade students to participate in our experiment. We had 5 different grade-level math tests and 5 different grade-level memorizing tests for them to complete on different days. We tested the subjects the same time each day and kept track of the amount of hours slept along with their scores. Materials used: grade-level math tests, grade-level memorizing tests, calculator, minute timer, pencils.

Results
The results showed that the amount of sleep only had a small affect on math and memorizing abilities.

Conclusions/Discussion
We found that a person's ability to memorize and compute math problems, only has a little to do with the amount of sleep they got the night before. It turns out that a person's learning ability has more to do with it. There were other variables that we could have looked at, such as eating breakfast, state of mind, ability level of test subjects, physical health/wellness, personal stresses, hunger/dehydration.

Summary Statement
Our project examined the effect that sleep deprivation has on math and memorizing abilities.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Kyle P. Hoffer

Project Number
J0317

Project Title
Motion and Emotion: Do These Factors Affect Short-Term Memory?

Abstract

Objectives/Goals
This experiment's goal is to determine if motion, associated with roller coaster riding, and emotion, such as anxiety and stress, affect short-term memory.

Methods/Materials
The twenty three participants took a verbal memory test before the roller coaster. They were verbally given a list of words and then tested by a written document that had some of the verbal set of words, and some false words. They were to choose the verbal words. The first test prior to riding, served as their control. The participants then rode the Belmont roller coaster one time and were tested as before, but with different words. They then rode five consecutive times and were tested.

Results
Individual results were recorded as were group averages for both male and female subjects. The average test scores indicated that the number of correct words chosen by the subjects decreased and the number of incorrect words chosen, increased. 78.3% of the subjects had significantly less correct words marked. 17.4% of the subjects had significantly more incorrect words marked. In addition, there was no significant difference between males and females.

Conclusions/Discussion
The group's average scores were definitely negatively impacted by the motion and emotion associated with the roller coaster. The number of subjects who had significantly less correct words marked (78.3%) was much higher than the percentage that had significantly more incorrect words marked (17.4%). Therefore, subjects did not remember some of the words from the list, but did not mark false words that they had not heard. It is also clear that males and females did not perform much differently on the memory tests. It can be concluded that the roller coaster riding disrupted the memories of the subjects and this indicates that employees, whose jobs require motion or emotion, may experience a decrease in memory function.

Summary Statement
The purpose of this experiment is to determine whether motion and negative emotions affect short-term memory performance.

Help Received
Father and Diane Anderson helped administer memory tests. Mother and Mrs. Gillum took digital photographs. Jonathon Clark, a NASA doctor, provided an insightful interview on motion and memory for the space program. Belmont Park provided their roller coaster.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Isabel A. Kuhel

Project Number
J0318

Project Title
Subliminal Influence

Abstract

Objectives/Goals
Advertisers have used subliminal messages for years to try to influence people into buying products. In a video, the images flash by so fast that you are not consciously aware of them. However, it is said that your subconscious mind picks up these messages and that they can make you want to buy a product. I tried to find out if video subliminal messages actually work the way they are said to.

Methods/Materials
I showed each test subject a video of my dog, with or without a subliminal message. The subliminal message was a triangle that flashed by at one 100th of a second, the shortest time possible with the video-editing software I had. After watching the video, I asked the person to choose between four shapes: a triangle, a square, a circle, and an octagon. I showed sixteen people the video with the subliminal message in it, and sixteen other people the exact same video but without the subliminal message.

Results
Eight out of the sixteen people that saw the movie with the subliminal message picked the triangle; that's 50%. Only four out of sixteen, or 25% of the control group picked the triangle. Of the remaining people who did not pick the triangle, half of both groups picked the circle and the other half was evenly divided between the square and the octagon.

Conclusions/Discussion
In conclusion, my project showed that a subliminal message can actually influence a person's decisions. Twice as many people who had subliminally seen the triangle than those who had not seen it picked that shape over the other shapes.

Summary Statement
Can subliminal messages influence a person's decisions?

Help Received
Father helped buy and install video editing software.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Joseph Kummerfeld; Brian Spain

Project Number
J0319

Project Title
In the Blink of an Eye

Abstract

Objectives/Goals
In this continuation project from our study on the effects of blinking on vision while reading and working on the computer, we sought to determine if the vision of soft contact lens wearers was worsened more than the vision of non-contact lens wearers while working on the computer for two and ten minute intervals.

Methods/Materials
Informed consent was obtained from 20 subjects of both genders, age 12 to 20. We performed five trials on 10 control subjects who did not wear contact lenses and 10 experimental subjects who did wear contact lenses. The procedures involved testing our subject#s near vision using the Rosenbaum Pocket Vision Screener. This vision test was done at the start of the study, after working on the computer for two minutes, and after working on the computer for ten minutes.

Results
After working on the computer the 10 experimental subjects who wore contact lenses, 5 had diminished vision in at least one eye after working on the computer for two minutes. After ten minutes, 7 of the subjects had changes in their vision. These 7 subjects who had vision changes had the changes in both eyes;
Of the 10 control subjects who did not wear contact lenses, 2 subjects showed a change in vision, in only in one eye after working on the computer for two minutes. Three subjects had changes in one eye after ten minutes. All of the non-soft contact lens vision changes were in only one eye.

Conclusions/Discussion
We believe that contact lenses, even soft contact lenses, lead to Dry Eye Syndrome, and performing an activity such as working on the computer will cause the eyes to dry out even more. Since age can be another factor in the development of Dry Eye Syndrome, we sought to control that variable by testing only teenage subjects. We think this project is important since many people may not realize that working on the computer may lead to decreased vision. This is especially true among contact lens wearers. With more and more people using computers, worsening of vision is becoming a greater problem.

Summary Statement
Given the increasing usage of computers and soft contact lenses, this project measures the changes in vision after working on the computer for two and ten minute intervals of soft contact lens wearers and non-contact lens wearers.

Help Received
Three eye medical professionals, an Ophthalmologist and two Optometrists, provided us with interesting information and support. Also, our parents encouraged us to continue to study this important subject.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Michelle S. Lau

Project Number
J0320

Project Title
The Honest Liars

Abstract

Objectives/Goals
The goal of the study is to find out how accurate observation is done by eyewitness.

Hypothesis: I believe that eyewitness is not accurate and their details are sometimes false. I think so because human memory is not perfect and as a famous psychologist Elizabeth Loftus an expert in eyewitness also believes that human memory is not perfect. Also, their full attention may not be directed at the crime scene. Therefore I believe observation of eyewitness is not accurate.

Methods/Materials
Method:
1. I recorded a family event and edited it into DVD video.
2. A group of subjects of different age groups were selected.
3. I show them the video on a DVD player in a fixed time.
4. The subjects answered questions related to the video

Materials:
Camcorder computer
Pencil and Papers DVD (the video)
Questions to be answered DVD player

Results
46.2% or 288/624 of the total answers were correct. The color identification was 37% correct. The people identification was 48% right. The object identification 57% was correct. The females got 5.6/12 as their average answer and the males got a 5.3/12 as their average answer. For the three age groups, the children (12 or below) got 50% of all the questions asked, the teens (13-19) received a 46.6% of all the questions asked correct, and the adults resulted as a 44.1% out of the total questions asked.

Conclusions/Discussion
The overall results were poor since less than half of the questions were answered correctly. The accuracy for object identification was better than color identification and people identification. Although females scored higher than male, the results were very close, showing not much difference between the genders. For the three age groups, the children's results were the best. However, it was only a small insignificant difference. But it shows that children's memory are as reliable as adults. My hypothesis was correct. Human memory is not very reliable and should be taken into consideration when admitted as evidence.

Summary Statement
My project showed that human memory is not very reliable.

Help Received
Father helped edited the video and put it into DVD.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Jonathan J.P. Lee

Project Number
J0321

Project Title
Oscitancy: Is It Contagious?

Abstract

Objectives/Goals
The objective of the experiment was to determine whether yawning (oscitancy) is contagious in children.

Methods/Materials
Informed consent from each participant in the experiment was obtained by means of an assent form. Participants who were aware of the nature of the experiment were excluded from the study. To test my hypothesis, I made two DVDs from a selected series of MPEG video files of three children (friend, brother, and myself). The first DVD showed children yawning followed by smiling (Y-S), and the second DVD showed children smiling followed by yawning (S-Y). Both of the DVDs were identical in duration (5 minutes 38 seconds) and were specifically made for the experiment.

The first DVD was shown to a group of 12 sixth graders, and the second DVD was played to another group of 12. The response of both groups was recorded while each DVD was played. The recording was viewed, and the frequency of yawning during each section of the DVDs was recorded by two independent observers.

Results
Descriptive statistics showed that yawning occurred more often during the yawning than the smiling section when each DVD was being played. The yawning means were 6.22 and 2.39, and the medians were 6.5 and 1.5 respectively. Analysis using the Wilcoxon Paired Samples Signed Ranks Test showed statistically significant differences in yawning between both sections in both DVDs (p less than or equal to 0.01 in Y-S and p less than or equal to 0.03 in S-Y), confirming the findings in the descriptive statistics.

Conclusions/Discussion
In summary, yawning occurred 2.6 times more often when the sixth graders were watching the yawning compared than the smiling section. The difference was clinically and statistically significant. Yawning was shown to be contagious in these children.

Summary Statement
Yawning was scientifically proven to be contagious in sixth graders.

Help Received
Dr. McBurnett, UCSF, for study design; Dr. Gansky, UCSF, for biostatistics; Mr. Keen, Keen Digital Artz, for vidography; Miss Susan Sherman, CAIS, as my advisor, Benjamin Lee, Tommy Kwok, and all 6th Graders, CAIS, for being ideal oscitancy subjects.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Sarah L. Mickelson

Project Number
J0322

Project Title
Picture, Picture, on the Wall, Who Is the Guilty One of All-Eyewitness Identification?

Abstract

Objectives/Goals
The objective of my project was to determine if the method of identification used in a photo line up, simultaneous method (viewed all at once) vs. the sequential method (viewed one at a time), affects the accuracy of the eyewitness identification.

Methods/Materials
3 versions of photo line ups were prepared: (1) Non-biased (line up members look similar to perpetrator); (2) Biased (perpetrator is only line up member wearing yellow shirt and blue cap the same as in video clip of purse snatching); (3) Non-biased (line up members look similar) - perpetrator not present. The 3 versions were presented in 2 ways: simultaneous and sequential. 60 eyewitnesses viewed a video of a mock purse snatching and were asked to identify the perpetrator after viewing the photo line ups (10 each version shown simultaneous; 10 each version shown sequential) by filling out a questionnaire.

Results
Photo Line Up Non Biased Perpetrator Present - Simultaneous: The perpetrator, #7, was chosen 40% of the time. Sequential: #7, was chosen 20% of the time. Photo Line Up Biased Perpetrator Present-Simultaneous: #7, was chosen 70% of the time. Sequential: #7, was chosen 60% of the time. Photo Line Up Non Biased Perpetrator Not Present-Simultaneous: [Perpetrator] Not Present (the correct response) was chosen 20% of the time. Sequential: [Perpetrator] Not Present was chosen 70% of the time.

Conclusions/Discussion
The purpose of this project was to determine whether the simultaneous vs. the sequential method affects the accuracy of eyewitness identification in a photo line up. My findings showed that when the perpetrator is not present in the line up, the sequential method provided substantially more accurate responses than the simultaneous method-70% vs. 20%. However, when the perpetrator was present in the line up, the simultaneous method provided slightly more accurate responses-40% vs. 20%-but with both methods (perpetrator present) 60 to 80% still chose the wrong person, an innocent person. For the biased line up, the method of presentation appeared to make no difference because the majority of the eyewitnesses in either case chose #7 the perpetrator (70% simultaneous; 60% sequential). This shows how a lineup can be set up to influence the eyewitness to guarantee the result.

Summary Statement
Project is about how the methods of identification (simultaneous vs. sequential) used in a photo line affect the accuracy of the eyewitness identification.

Help Received
Mother assisted as needed; Science teacher, Mrs. Williams, helped with many important details.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Miles T. Murphy

Project Number
J0323

Project Title
Memory

Abstract

Objectives/Goals
Learning is the main objective in the classroom, but with the current methods of teaching this can at times be a more difficult task than it need be. The purpose of this experiment was to determine which method of presenting information-the pictorial, textual or verbal method-was most effective at helping student#s ages 12-14 retain the information they had studied.

Methods/Materials
To reach a solution I had a selected group of students study a set of information with the intent of memorizing it. I was able to measure their level of retention by having them complete a 5 question test based on the information they had just perceived.

Results
The measurements derived from these tests confirmed my hypothesis that the pictorial method was more effective than the textual or verbal methods of presenting information to students. Of the tests conducted the best value for the pictorial method was 4.6 (out of 5) correct answers per test, while the best value for the textual method was 4.1 correct answers per test which was followed by the verbal method whose best value consisted of 3.1 correct answers per test.

Conclusions/Discussion
These results suggest that the current means of teaching, which mainly relies on textbooks to convey the information, is ample but could be further improved. Based on my findings it is my belief that this could be accomplished by further supplementing our existing textbooks with more graphs and illustrations.

Summary Statement
The intent of this project was to shed light on which method of conveying information was the most effective at helping 12-14 year old children retain the information.

Help Received
Participants used under supervision of science teacher.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Soham Naik

Project Number
J0324

Project Title
Is Black and White or Colored Text More Easily Remembered?

Abstract

Objectives/Goals
The objective of this experiment was to determine if colored versus black and white printed words affects human memory.

Methods/Materials
Procedure: 1. Create all of the materials (list one and two); Gather the words for the lists by using a spelling book from a grade lower than the grade your subjects are in; Randomly select half the words to print in a bright color; Write the instruction script for each group before they begin the experiment. 2. Get together a small test group: ten people, about five boys and five girls. 3. Have the people sit in the same room away from each other and get comfortable. 4. Read the instructions to the group before they see "List #1". 5. Hand out "List #1". 6. Instruct them to read the list carefully for two minutes. 7. After exactly two minutes, take away the list.
8. Let them leave for 30 minutes before giving them "List #2". 9. After an hour is over, call the subjects back to take "List #2". 10. Give each person "List #2". 11. Read them the second set of instructions. 12. Give them two minutes to select their answers on "List #2". 13. After the two minutes are over, gather all of the tests. 14. Check their answers with a key that has all the right answers. 15. Record the information. 16. Repeat steps 1-15 as many times until all subjects have been tested. 17. Compare the data to see if they remembered words in color better, or words in black and white.
Materials: QUANTITY ITEM DESCRIPTION
100-500 People around the same age
80 List #1#s. 20 words, half black and white, half color.
100-500 List #2#s. 40 words all in black and white. All of the words from list one, 20 new words. On the left of each word there is a check-off box. Each person has to check off 20 words they can remember from the first list.

Results
The average for color was 7.5 and for black and white words 6.65.

Conclusions/Discussion
The results indicate that my hypothesis was wrong. For boys they remember colored words more and girls remember black and white words more. The average for black and white words boys remembered 6.4 words and the girls remembered 6.9 words. For colored text boys remembered 7.7 and girls remembered 7.3 words. As a group they remembered colored words more. The average for color was 7.5 and for black and white words 6.65.

Summary Statement
My project is about if people remember Black and White or Colored Text more.

Help Received
Students and Adults- for tests

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Danielle M. Noble

Project Number
J0325

Project Title
Can You Believe Your Eyes?

Abstract

Objectives/Goals
Since the fifth grade, I have been fascinated by optical illusions. It is easy to look around and see things with our eyes, but what happens when we look at images or pictures that are confusing or tricky -- an optical illusion? Is our brain able to perceive what is really there, or are we unable to make sense of it and continue to be fooled by the illusion? For my science project I wanted to see if the eighth-grade students at Madison Middle School would be able to figure out some common optical illusions. Are the girls better at this or are the boys? My hypothesis: Given an equal amount of eighth-grade boys and girls, the girls will perceive optical illusions with a higher percentage of accuracy than the boys.

Methods/Materials
For my procedure, I selected a sample of 50 girls and 50 boys from the eighth-grade science and math classes to test their responses to seven optical illusions that were part of three categories: two pictures with figure-ground (black and white scrambled patterns), one illusion in print (with lettering), and four illusory geometric figures (with lines and circles) that were in two-dimensions or three-dimensions. I created a series of questions that applied to each illusion and tested the students on their perceptions.

Results
The results showed that, overall, with 7 illusions, the girls were more accurate in their perceptions of the optical illusions than the boys. There were 350 possible correct responses for each group of 50 subjects: the girls had 119 correct answers (34%) while the boys had 96 correct answers (27.4%). However, comparing scores on each type of illusion, there were some variations in the results of the accuracy of the perceptions for the boys and girls, which can be seen in the data.

Conclusions/Discussion
In conclusion, my hypothesis that the girls would be more accurate overall in their perceptions of illusions was supported by the test results. There was, however, only a difference of 6.6% between the girls and boys, and neither group scored very highly in perceiving the optical illusions accurately. With both groups combined there were only 30.7% correct responses. I was surprised that less than one-third of the student#s perceptions overall were accurate. The results of this experiment show me that eighth-grade students have difficulty in perceiving pictures or objects as they really are. This can greatly impact what and how they learn.

Summary Statement
Is it easier for eighth- grade boys or girls to correctly perceive optical illusions?

Help Received
Father helped construct board; Mother helped edit report.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Patrick B. Nordstrom

Project Number
J0326

Project Title
How Fast Are You?

Abstract

Objectives/Goals
The objective of this project is investigate whether there is a relationship between the speed of a person's eye-hand coordination, and the amount of time they play video games per week.

Methods/Materials
In my experiment I approached a total of 100 people at the Oaks Mall and asked them to take a reflex test. 50 people played video games for 7 hours or more per week, and 50 people played for less than 7 hours per week. The test involved the following; interview, ruler reflex test and the individuals reflex rating.

Materials:
1. (1) Ruler
2. (1) Log Book
3. (1) Survey
4. (1) Calculator
5. (1) Reflex Scale
6. (1) Permit
7. (1) Oaks Mall security clearance
8. (1) EB Games manager clearance

Results
By analyzing the numbers recorded in my log book, it was safe to say that the video gamers (plays 7 hours or more per week) had better reflexes than the non video gamers (plays less than 7 hours per week).

Conclusions/Discussion
The hypothesis that people who play 7 hours or more of video games per week have better reflexes than those who play less than 7 hours per week is accepted because data showed that the average of the gamers was 12.6cm while the average of the non gamers was 17.6cm. So in the end, this experiment shows that if you play 7 or more hours of video games per week, you have better reflexes than people who don't.

Summary Statement
This science project investigates whether there is a relationahip between the speed of a person's eye-hand coordination and the number of hours they play video games per week.

Help Received
Mother helped with board layout.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Maria Elena Pino

Project Number
J0327

Project Title
It's White, Right?

Abstract

Objectives/Goals
It's White, Right? is an experiment to test the mental flexibility of a person by asking him or her to say the color of the text of a word while suppressing his or her reading of the word.

Methods/Materials
Two pretests confirmed that the subjects were literate ant could identify color. The subjects used a computer program to record their answers and the time elapsed on each trial.

Results
The results proved my hypothesis true, showing that it took longer to determine the correct answer in the third test than the simple tests on word and color. It did take longer to complete Test 3 than it took to complete the other tests. Not only did people take more time on Test 3, but they also got less correct on that test. It took an average of 14.41 seconds to complete test three with an average of only 8.17 correct out of ten. This is a large difference from the average of 12.71 seconds to get 9.58 correct out of ten on Test 1 and the 9.89 seconds to get 9.77 correct out of ten on Test 2.

Conclusions/Discussion
In conclusion, this experiment proves that the mental flexibility of a person is heavily strained when one has to change one's response from the word he or she read to the color he or she sees.

Summary Statement
My project, titled "It's White, Right?," uses the Stroop Effect to test mental flexibility.

Help Received
I did this project with the assistance of the Colina Middle School computers.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Tammy Y. Rubin

Project Number
J0328

Project Title
Color vs. Memory

Abstract

Objectives/Goals
The problem is to determine if color has an affect on the human memory.

Methods/Materials
Two reading tests were given at the same reading level (5th grade level.) Subjects were required to answer questions on both tests. Both tests were written in black and white font as well as written in a color version. Each test was used first at one point of the testing period. Answers were graded and recorded.

Results
The results show that the color tests were shown to have higher test scores then the black and white test. In the color tests, the ratio was that a quarter of the people got 100% while in the black & white tests, only 17% got 100%. There were also less 83% in the color tests because they came out to 27% while the black & white tests came out to almost half. The scores on the color test were higher 16% higher then that on the black and white test. Some of the scores however, remained constant. This pertained to the 17% test score.

Conclusions/Discussion
In conclusion, making important words in color helps a person remember the information more easily.

Summary Statement
To determine if color has an affect on the human memory.

Help Received
Supervised and assisted by Mrs. Pat Paluso (Science Teacher)

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Andrew W. Satterberg

Project Number
J0329

Project Title
Homework Helper?

Abstract

Objectives/Goals
My objective is to find out if playing the video game "Battlefront 2" affects 5th and 6th grade boys' math abilities after school.

Methods/Materials
First, I invite two kids over to play the video game Battlefront 2 directly after school. They play for thirty minutes. Then, in separate rooms, they both take a math test while I time them. A few days later, I have them come over after school to do another test. This time, they do it before playing video games. After all my subjects do the process twice, I compare the data, and I see if they did better before, after, or if they did the same. I collect data on how long it takes to do the test. I then correct each paper and figure the percentage of problems each subject got right. I also compare the amount of time it took to perform each test.

XBOX game console
Two equally difficult math tests appropriate for 6th graders
Star Wars Battlefront 2 video game
TV
Stopwatch

Results
My conclusion is that for certain people, video games can help them do their math faster or more accurately. But for others, video games can make them do a lot worse, in score and time.

Conclusions/Discussion
My mixed results neither proved my hypothesis right nor wrong. The results are inconclusive. There were many other possible variables that might have affected the performance of the students. Some of these variables might be how distracted they were while taking their test, or how much sleep they had the hight before, or if they were hungry, or bored, etc.

Summary Statement
This project attemps to determine the effect of video game playing on students' math abilities

Help Received
Friend helped with creating graphs; Teacher provides math questions for tests

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Meagan T. Sitzer

Project Number
J0330

Project Title
Aromatherapy: Can It Boost Your Test Scores?

Abstract

Objectives/Goals
Aromatherapy has grown in popularity and the users do not have any scientific evidence that it works. Previous research has provided the information needed to conduct this experiment. The purpose of this experiment is to see if aromatherapy affects test performance in adolescence.

Methods/Materials
The materials needed for this experiment were aromatherapy essential oils, lavender and rosemary, an oil diffuser, and the tests. The experiment consisted of two eight grade classes. They were separated into groups, lavender and rosemary. The experimenter distributed the first test and the students were given 15 minutes to complete it. Once the time was up the essential oil was diffused into the room. The students then took the second test and were given the same amount of time. Once the testing was completed, they were given a score and were recorded.

Results
The analysis from the data recorded showed that the essential oils affected the test scores of adolescents. By doing a statistical analysis, the experimenter was able to find that lavender increased the subjects test performance after the essential oil was diffused by 15% while the rosemary groups test scores were only increased by 13% after the diffusion. Comparing boys and girls, the girls preformed better after the essential oil was diffused.

Conclusions/Discussion
The researcher's hypothesis is that aromatherapy using lavender or rosemary essential oils will enhance cognitive performance by 15% in adolescents as measured by an IQ test. In conclusion, the lavender group preformed higher on the cognitive test than the rosemary after the aromatherapy was diffused. Another conclusion that can be made from this experiment is that the girls scored higher than the boys in both the lavender and the rosemary groups. The results prove the experimenter's hypothesis to be true.

Summary Statement
The purpose of this experiment was to see if aromatherapy essential oils lavender and rosemary affect test performance in adolescence.

Help Received
Parent helped gather materials and come up with the test to measure cognitive performance.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)

Patrick M. Sullivan

Project Number

J0331

Project Title

Do Facial Expressions Affect Intonation in Singing?

Abstract

Objectives/Goals

The goal of this study was to find out how facial expressions, specifically the raising or lowering of eyebrows, affect an individual's ability to sing pitches accurately. The hypothesis was: If young singers raise their eyebrows while singing an ascending phrase in an upper register, then their intonation will be more accurate than when their eyebrows are in neutral or lowered (scrunched) positions.

Methods/Materials

Informed consent was obtained for a study population of experienced choral singers. Subjects of both sexes, aged 7-14 years, were played a key reference and an ascending musical phrase on a piano. They sang the phrase with eyebrows in a neutral position, then raised, and finally scrunched. The test was repeated three times. A laptop computer, using Raven Lite 1.0, acquired the sounds and produced spectrograms by which pitch frequencies could be measured in Hz. Multiple readings of the final and target pitch, E5, were made and compared to the piano reference.

Results

The statistical mean frequency (in Hz) for the target E5 pitch was calculated for all phrases sung with neutral eyebrows and then converted to an intervallic measurement in cents. Compared to the piano, the E5 sung with neutral eyebrows was 2.6 cents higher. Doing the same for raised eyebrow test samples, the E5 was 2.6 cents lower. These were both under the "Just Noticeable Difference" threshold of 5 cents. Phrases sung with scrunched eyebrows produced E5 pitches averaging 18.6 cents lower than the target.

Conclusions/Discussion

The hypothesis, that the target pitch ending the phrases sung with raised eyebrows would be more accurate in reference to the piano than those sung with either neutral or scrunched eyebrows, was only partially accepted. Raising the eyebrows while singing produced pitches which were more accurate than when scrunching them down, but of the same relative accuracy as when left in a neutral position. However, scrunched eyebrows clearly affected intonation and produced E5 pitches averaging a musically significant 18.6 cents lower than the target. The hypothesis was based on a presumption of a physiological interaction between eyebrow positions and vocal tract shape. With this group of singers, the interaction appears to occur only when they lower their eyebrows. The results might be different with singers who are not so well-trained. The experiment should be repeated with study populations of varying abilities.

Summary Statement

This project investigates whether the raising or lowering of eyebrows affects an individual's ability to sing in tune.

Help Received

Mother took me to the UCLA Music Library, helped type the report, and glue the display board; Dr. F. Clark, Music Director, Georgia Institute of Technology, consulted on research plan; School Principal arranged for use of choir room.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Joseph A. Taviano

Project Number
J0332

Project Title
Do You Hear What I Hear?

Abstract

Objectives/Goals
My project is about sound and how people hear sounds. How we hear and interpret them varies from person to person. The primary focus of my project was to find out whether people with musical experience can distinguish between different musical notes better than those with no musical training. Additionally, I compared men and women, and younger and older people.

Methods/Materials
Materials used for this project include: tape player with cassette containing recording of 24 pairs of musical tones, response forms, answer key, piano.

Procedure: 24 pairs of piano tones were recorded and played for test subjects who indicated on response form a comparison of the pairs. Response forms were graded and results charted and analyzed.

Results
My results were somewhat mixed compared to my stated hypothesis. In comparing results for musical and non-musical people, I found that all of the musical people scored 100 percent, concurring with my hypothesis. In comparison, the non-musical people had results ranging from 100 down to 75 percent.
In the results for men and women, I found that my hypothesis was incorrect, with men averaging 93.5 percent and women averaging 76.8.
Finally in considering the test results of the younger and older groups, I also found my hypothesis to be technically wrong, though the average scores only differed by .8 percent.

Conclusions/Discussion
It is apparent that the process of hearing and discriminating between musical notes of different pitches is very complicated. It is a safe assumption that anyone with musical training would probably score perfectly on this sort of test because the nature of their training would give them the skills to discriminate between pitches. For the other individuals tested, there are several reasons why they might not score well on this testing, ranging from physiological to environmental causes. Perhaps a deeper examination of the individuals and their results would yield more insight into the explanation of their scores.

Summary Statement
The primary focus of my project was to find out whether people with musical experience can distinguish between different musical notes better than those with no musical training.

Help Received
Mother helped type text.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Nathan Tiangco; Anders Young

Project Number
J0333

Project Title
The Effect of Noise on Pilots' Performance

Abstract

Objectives/Goals
Our project objective is to determine if cockpit noise affects the performance of pilots. We believe that increased noise will serve as a distraction, and therefore lessen the pilot's performance.

Methods/Materials
We selected 4 test subjects, who were not pilots. We trained them in the use of a computer program, Flight Simulator 2004. We ran this computer program on a Dell laptop with a flight yoke attachment. After a period of initial training, we observed their performance on simulated take-offs and landings under varying noise levels. We rated take-off performance on a point scale according to how centered they stayed on the runway, maintenance of 10 degrees upward pitch, and smoothness of rate of climb. We similarly rated landing performance according to adherence to glide slope, remaining centered to the runway during the approach, an even rate of descent, and smoothness of touch down

Results
All of our test pilots were able to complete successful take-offs. Their rated performance on take-offs did drop substantially with higher noise levels.

Only 3 of our 4 test pilots were able to successfully complete a landing, and 2 of the other pilots had great difficulty achieving consistent landing patterns. We could not yet demonstrate a clear pattern of performance with relation to cockpit noise, given the overall poor performance on landings.

Conclusions/Discussion
Our conclusion is that noise does adversely affect pilot performance, once they've achieved a basic level of proficiency. Our test pilots achieved proficiency in take-offs, and increasing noise did adversely affect their performance at this task. We underestimated the technical difficulty and time required to train test pilots in the landing phase of simulated flight. As such, our pilots did not achieve sufficient baseline skill consistency at landings to adequately judge the added effect of noise.

Summary Statement
We explored the effects of noise on pilots' performance using a computer flight simulator.

Help Received
Mother helped with typing and editing. Parents supplied computer equipment. We borrowed a decibel meter from a family friend.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Jonika M. Weerasekara

Project Number
J0334

Project Title
The Effect of Net on Free Throw Accuracy

Abstract

Objectives/Goals
The objective of this investigation was to learn if the presence or absence of the net affected free throw accuracy. The hypothesis was: if the net is removed from the hoop then the subject#s free throw accuracy will decrease

Methods/Materials
Adjustable hoop, 7 people, paper, clipboard, pencil, net, stepstool, free throw line, official NBA sized basketball court, camera, and computer.
Seven basketball players were asked to perform this experiment. The subjects shot five sets of five free throws with the net on. Then they shot 5 sets of 5 free throws with the net off. The data was recorded.

Results
The subjects shot with 57.71% accuracy with the net off and 54.86% accuracy with the net on. The subjects overall, made more shots (were successful) with the net off. With the net on, the standard deviation was lower at 1.01 and higher with the net off at 1.37.

Conclusions/Discussion
The data gathered in this experiment did not support the hypothesis that having the net off the hoop would decrease free throw accuracy. The subjects made more shots with the net off, yet the standard deviation was higher meaning that they shot less consistently. From the data gathered, it seems helpful for the shooter to remove the net from the hoop to increase shot percentage.

Summary Statement
This project analyzes the effect of net on free throw accuracy.

Help Received
Mother proofread and helped me understand graphs. Steve Yount helped me understand standard deviation.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Benjamin I. Weissman

Project Number
J0335

Project Title
Tone Replication

Abstract

Objectives/Goals
The goal of this project is to determine whether there is a correlation between accuracy of tonal replication and various factors.

Methods/Materials
Thirty eight subjects were interviewed and tested with a tone generator. Each subject was required to fill out a questionnaire indicating various factors. Factors examined included playing an instrument, interest in singing, musical preferences, and musical experience parents.

Results
Results were consistent with some of the hypotheses. Positive correlations were found between subjects' accuracy scores and the length of time playing a musical instrument, musical experience of parents, and for some of the musical preferences.

Conclusions/Discussion
Subjects who have prior musical experience with an instrument are more likely to replicate tones accurately. Subjects who had more years playing an instrument had a greater likelihood of more accurately replicating tones. Subjects with at least one parent who played an instrument were more likely to accurately replicate tones.

Out of the top three musical preferences, subjects who preferred classical music were more able to accurately replicate tones. But there was no correlation or perhaps a negative correlation between accurate replication and liking to sing.

Early musical experience may improve one's ability to make music and to appreciate music. The results suggest that musical skills are not only inherited but can also be acquired through experience. This information can be helpful to teachers and school districts in establishing music programs.

Summary Statement
This project tested whether there is a correlation between tonal replication accuracy and musical background.

Help Received
Mother helped type the report and glue the poster board. Father helped research the project. Teacher helped with the correlations, graphs and completing other guidelines.

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Shannon E. Whitaker

Project Number
J0336

Project Title
How Does Noise Pollution Affect the Concentration Levels of Teens?

Abstract

Objectives/Goals
my objective was to learn if noise has any affect on students in their work environments.

Methods/Materials
I will be using 30 of my peers as my subjects. They are all between the ages of 12 and 14 years old. The subjects will be placed in 3 different environments. Such as listening to music, having a television on, or have complete silence. Each subject will be given some 8th grade material to study, then after a certain amount of time, the subjects will take a test on what they have just studied. I will then use the results of my tests to theorize what tests did better in what environment(s).

Results
The males and females preformed the best in the silence category. The males recieved an 80% on their tests with music while females recieved an 90% with music. Although the females preformed better than the males in the music environment, the males preformed better in the television environment while the females did poorer in this environment. The males recieved an 84% in the television enviornment, while the females scored an 85%.

Conclusions/Discussion
After the completion of my experiment on how noise pollution affects the concentration levels of teens in a silent environment, my hypothesis was correct. I predicted that that the silence would have the least affect on the teenagers. After testing this project on both males and females, both had a better percentage in the silent environment.

My hypotheses for television and music on males were incorrect. It stated that the television will have the greatest effect on the males followed by the music. Instead, the television had a lot of affect on the male#s performance, but it was not the greatest affect. The students who took the tests with the music received an 80% while the males that took the tests with the television received an 84%.

My hypotheses for television and music on females were incorrect. It stated that the music will be the greatest distraction and the television would not be the greatest. After completing my experiment I discovered that the television had the greatest affect on the females. The students who took the tests with television received an 85% while the students who took the test with music received a 90%. In conclusion I have discovered that music or television (noise pollution) does affect the concentration levels of teens.

Summary Statement
My project is testing if noise or distractions has any affect on students in their work environments.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Emily J. Zolfaghari

Project Number
J0337

Project Title
Step It Up: A Study of Music and Exercise

Abstract

Objectives/Goals
In my experiment I ruminated on whether the tempo of music affects aerobic exercise. If so, then music with more beats per minute will increase the number of steps a person takes in a given amount of time.

Methods/Materials
The materials needed for my experiment are: a pedometer,watch, 4 humans, 5 sheet music (for different beats), 5 songs that can be played on a cd (that is same arrangement as sheet music), pen and paper, an open area for walking, a CD player, metronome, and headphones. In doing this experiment, you find the tempo located on the left hand corner of the sheet music, if not, you play the metronome according to the arrangment of music. Play the tempo against a watch set for one minute. This will give you the beats per minute. Repeat to all of the different songs. Talk the four participants and while wearing the pedometer, allow them to walk around the open area for 5 minutes while listening to a selected song. Once done with 5 minutes, record the number of steps taken for each tempo of song listend to and repeat for other selected tempos. Average out the number of steps taken from each of the participants for each of the tempos after walking for 5 minutes to each of the 5 songs. This will help you to find the results on which tempo allows a person to walk further in a given amount of time.

Results
The results came out to prove that people walk further when listening to music around a tempo of 104-116. This proved my hypothesis incorrect.

Conclusions/Discussion
I consider my experiment inconclussive because of the carpooling times taken place for each of the participants. By some parents waiting in the parking lot, it was noticed that participants would walk more briskly when knowing the parents were waiting for them. Although this was noticed, the outcome of my experiment came out to be that people walk further when listening to a more moderate tempo of 104-116.

Summary Statement
How the tempo of music affects the distance people walk in a given amount of time.

Help Received
My friends for participating in the experiment and my mother for driving me around