

Abstract: Science and Engineering Fair of Houston

1032

Brainrot Epidemic

Bria Linehan

Conroe ISD /Knox Junior High

Category:

Behavioral and Social
Sciences

The purpose of this experiment is to research and highlight the effects of social media on the grades, attention span, conduct, and social skills of students in 7th to 12th grade. The hypothesis states that IF a student spends a lot of time on social media, THEN it will have a negative impact on grades, disciplinary conduct, and attention span. In contrast, it will have a positive impact on social skills. This is BECAUSE the time wasted and the easy access to dopamine will make it harder to focus in school and know how to act in formal settings. Social media does, however, provide an easier way for people to communicate and will benefit connections. In this experiment, the researcher has prepared an anonymous survey for participants to fill out. This survey will provide information about the relationship between grades and the time spent on social media. She will then use credible sources to research social media's effects on students' conduct, attention span, and social skills. In conclusion, social media has a negative effect on attention span and conduct because of dopamine and harmful trends, respectfully. It had a positive effect on social skills due to easier connection and expression with the one main drawback of cyberbullying. Lastly, the survey did not provide a correlation between grades and time spent on social media. This effectively disproved the hypothesis that time spent on social media negatively impacted grades. Social media is incredibly widely used and the information from this project can help people by highlighting the risks and benefits that come with it. Going forward, the researcher hopes that people can become more educated about the apps they are using and understand the long-term effects it might have on them and those around them.

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 Vertebrate animals microorganisms rDNA tissue

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Abstract: Science and Engineering Fair of Houston

1033

Color to Brain

Eleanor Williams

Clear Creek ISD /Seabrook Intermediate School

Category:

**Behavioral and Social
Sciences**

Studies have shown that different colors of paper can have an effect on test scores. Experiments have said many different things like green paper sparks creativity, pink paper is bad for testing, and so on. A new study was conducted to see what the data showed this time. When the study was conducted, it was hypothesized that green paper would have the biggest effect on test scores. 50 participants were given a different colors of paper with the same article and questions, and these papers were checked to see the results and used to compare all the different colors of paper. At the end of this study, what was found out was that pink was the most accurate and blue paper was the fastest.

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Abstract: Science and Engineering Fair of Houston

1034

Brain rot or brain fuel? The cognitive impact of short-form videos on early adolescents.

Anvithasree Srinivasan

Conroe ISD /Knox Junior High

Category:

Behavioral and Social Sciences

As consumption of short form content among adolescents increases, more scientists delve deeper into the impacts on the prefrontal cortex. This study explores how varying the time exposed to YouTube Shorts affects the reaction time, processing speed and sustained attention of early adolescents (12-14). The participants were divided into 3 groups: a control group (0 mins) and 2 groups with 2 and 5 mins of exposure. The hypothesis predicted those with a higher watch time would take longer to finish the tests and would have more errors. The results partially supported the hypothesis. Those with a higher watch time took more time to complete the test, showing that more usage of YouTube Shorts hinders cognitive functions in tasks that involve long periods of focus. However, tasks that are quick are performed better with improved pattern recognition and accuracy for a limited time as the brain is stimulated. 2 minutes is the ideal watch time. The results support the implementation of digital hygiene programs in schools, building awareness about the benefits and impacts of short-form video content.

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Abstract: Science and Engineering Fair of Houston

1035

Does Color Effect Memory?

Maissem Chekatt

Private/Iman Academy Southwest

Category:

Behavioral and Social
Sciences

This project investigated whether color affects memory. The purpose of this experiment was to determine if people remember words written on colored cards better than words written on white cards. Participants were shown a list of words on colored cards and a list of words on white cards for the same amount of time. After viewing the cards, participants were asked to recall as many words as possible. The number of words remembered from each type of card was recorded and compared. It is expected that participants will remember more words from the colored cards because color may help the brain focus and organize information. The results of this experiment may help students learn better study strategies by using color to improve memory.

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Abstract: Science and Engineering Fair of Houston

1036

Clock It: Investigating How Timers Affect Task Latency Among Middle Schoolers in Academic Settings

Londyn Christmas

Houston ISD/BCM Academy at James D Ryan - MS

Category:

Behavioral and Social Sciences

“Does the presence of a temporal constraint (countdown timer) influence the task latency and consistency of completion in a short-duration routine over a 7-day period?” In this testable question, task latency refers to the amount of time it takes to complete the task (from start time [6:00PM] to completion time), and consistency of completion refers to the measure of constant completion of the task WITHIN the 7-day period. My procedures easily help test this, especially since I am working with short-duration routines. Each person from each group will be directed to do a task and start it at a set time (6:00PM) each day. Each person will collect their data (Completion [Y/N] & Task latency [in seconds]), each person's latency will be averaged with their participant group, however, completion will be individual. My data consists of a Line graph for task latency, which compares Participant A group and Participant B group's average latency, also, A table will be added into a data showing individual completion of all 3 people from each Participant group, along with an average of each Participant group's completion EACH DAY. After collecting my data, it was found that the timer group (A) had a shorter task latency than the no timer group (B), which supported my hypothesis. In addition to this, the completion part of the results shows that Participant A group had a LOWER completion rate and had their rate decrease as more days went by.

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Abstract: Science and Engineering Fair of Houston

1037

AI Hyperrealism

Sae Suresha

Conroe ISD /McCullough Junior High

Category:

Behavioral and Social
Sciences

This science fair project examines the reality level of AI-generated images compared to actual human photos on the phenomenon of AI hyperrealism. The aim of the experiment is to examine the capability of the respondents in clearly determining whether AI-generated face photos are more realistic compared to natural human face photos. A survey was conducted on 15-25 respondents using 10 AI-generated photos created using Canva and 10 natural human photos from Pexels.com. The respondents were requested to classify photos into real or AI-generated photos while explaining the characteristics behind the reasoning. The data gathered yielded observations on challenges in observing the photos. The feature used to identify related to the background of the photos. Overall, the result of the experiment generally shows that AI graphics are not more realistic compared to actual photos. Also shown is the existence of the phenomenon of hyperrealism.

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Abstract: Science and Engineering Fair of Houston

1038

How Positive and Negative affect us

englebert oben

Charter/SST - Champions College Prep - MS

Category:

Behavioral and Social
Sciences

The reason why people should care about this is because it can increase the grades that students are getting depended on the type feedback so in theory it could increase students' grades by a lot which would not only help a specific area, but it would help the whole world just by knowing how positive and negative feedback affects students. The problem I'm trying to solve is students' not getting good grades that is also the reason why I chose this project specifically though mostly it's to help teachers they try hard to get students 100's every single day I think feedback can also help too. I am going to try to solve this problem with a simulation where there is 3 groups of people and they get divided into positive negative and neutral feedback and gave them two word searches to see how they did before they got their feedback and after they got their feedback. The different variables are the feedback as the independent variable, the people as the dependent variable and the people who are giving the feedback as the control variable. the result of this project was not expected at first without the feedback the positive was winning with an average of 9 negative second with 7.5 and neutral third with 7 after the feedback positive had 10 words or (10%) more words neutral in second with 8 words or(6%) percent more words while negative actually has 2 parts one is first the other is third for the bad side of negative there was 6 words for 80% of the people who have negative feedback (-14%) while the 20% of people with negative feedback got 7 words instead of 6 because they take negative feedback as positive they got (-14%) more Overall, i think if this project is successful, it could change the world for the better and I learned from this project all people take feedback in different ways for some negative feedback is the most successful for others they like positive feedback better, but people who see negative feedback as positive are less common.

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Abstract: Science and Engineering Fair of Houston

1039

Making Sense Of Altruism

Veda Valiveti

Conroe ISD /Knox Junior High

Category:

**Behavioral and Social
Sciences**

This study explores human altruism, focusing on pure altruism - when someone commits an act of kindness that helps a stranger at a personal disadvantage. While some people appear naturally altruistic and others more egotistic (lacking empathy), altruism may also be a trait that can be acquired. Based on recent research, altruism originally was thought to have stemmed solely from the amygdala, the emotional processing part of the brain. Now it is understood that the amygdala's emotional feelings sends cues to the Prefrontal Cortex, making sure positivity influences the logical decision making done by that part of the brain, and bringing forth the extreme decisions that altruists are found making. This experiment tested whether people can be trained to behave more altruistically by positively influencing the Prefrontal Cortex (PFC) - a brain region involved in decision-making - through a brief mental and emotional training that affects the amygdala - the center of the brain responsible for processing emotions. Participants' altruistic levels were measured before and after training - which consisted of completing puzzles and watching an emotional video - and their scores were compared to a control group that received no intervention. The results showed that participants in the experimental group who experienced the testing had higher altruism scores on average, whereas the control group did not. These findings suggest that human altruism can be enhanced through targeted training that engages the PFC, amygdala, and related neural pathways.

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Abstract: Science and Engineering Fair of Houston

1040

Can People Tell the Difference Between Real or AI Images

Bryson Higham

Conroe ISD /McCullough Junior High

Category:

Behavioral and Social
Sciences

As Artificial Intelligence increases in complexity, it becomes more and more important to clearly define how well humans can decipher whether or not an image was AI generated or the components inside are or were existing. The research that took place explores how accurately the participants can correctly identify AI generated images, along with the variables and the visual cues that explain the results of the participants choices. Approximately 95 responses were recorded. These 95 participants were shown 4 sets of 2 images, one being real and taken by the project leader, and the other, generated and developed by OpenAI or otherwise known as ChatGPT. These images were of the following subjects known as a cutting board and knife, an apple in a kitchen setting, 1 salt and 1 pepper grinder, and a pair of rocker style light switches. The participants were asked to correctly identify the AI generated image. Other questions were asked such as their age, their experience with AI (computers), their confidence in each of their 'AI or not questions', the decision time, their preference on which image was more appealing, and a short reasoning of their choice. The final results reflect that the accuracy and other variables differ depending on the image and object type. House held, familiar items were found to have more of a higher accuracy. On the other hand, natural items were found to be less accurately depicted as AI, along with the fact that the apple seemed to have the highest confidence rating. This proves that confidence level seems to have a small impact on accuracy. Participants showed reliance mostly on lighting preferences, realism, texture, and real-world similarity. This seemed to expose that people often compared images and objects with their real-life experiences.

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Abstract: Science and Engineering Fair of Houston

1041

Is Math Really That Hard? Academic Stress and Coping Strategies Among Middle Schoolers in a Magnet School

Josue Salazar

Houston ISD/BCM Academy at James D Ryan - MS

Category:

Behavioral and Social Sciences

Academic pressure is a real thing. It can affect kids. It can make them depressed and get anxious. It can affect both their mental and physical health by giving them depression. Depression is a very serious mood disorder that makes the person feel sad and gloomy and making not want to take care of their body.. I am trying to figure out how advanced subjects like geometry can affect stress levels of advanced middle school students. In my school we have this class that teaches geometry and I wondered if they feel stress too. So I decided to make a survey to find out. Firstly I picked a group of students, then I made a survey to test my hypothesis that in fact they do face academic stress from advanced subjects. After I made my survey, I decided to do it for 2 weeks on Fridays. And I found that in an average rating from 1-5 hardness levels only 2% of all the answers were 5. But I did ask another question, "Did you feel stress this week." and I got 6 people putting yes and the other 2 put no. I also tell them "how they like to relax". Some put reading and some put gaming. This is interesting because it shows us that there is something else that is causing stress. So No, perceived difficulty in core subjects affects self-reported stress levels among middle school students.

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Abstract: Science and Engineering Fair of Houston

1042
Human Dynamics: Different Ages, Diverse Responses

Yoshna Gujju
Conroe ISD /McCullough Junior High

Category:
Behavioral and Social Sciences

For my project, I have tested teenagers, adults, and middle-aged individuals on how they react to persuasive influences, how they interpret the world around them, and how they respond to pressure. For the first test, I asked them their opinion on the best car brand and while having a five-minute conversation with them, I tried to use convincing tactics to get them to believe my opinion on the best car brand. For the second test, I gave them one picture of action, gave them two minutes, and asked them what they noticed about the picture. I have repeated this process two more times with two different pictures. Finally, I evaluated them on how they respond to pressure by having the individuals participate in three rounds of a memory challenge. I had five pairs of two identical pictures and arranged them in a 2x5 array. For the first round, I gave the participant as much time as they needed to memorize where each picture is, flipped the cards over and then pointed out each pair. For the second round, I shuffled the cards and repeated this process, except I gave them 1 minute and thirty seconds to memorize where the cards were located. As for the final round, I gave them only thirty seconds to memorize where each card was located. For all three tests, I recorded the data in my journal in tables and averaged the numbers between all three age groups for the tests. For the first test, 60% of all the age groups were confident in their opinion and the adults held their ground the best. The second test had teenagers notice the most details and grasped the hidden meaning of the picture well, while adults and middle-aged individuals noticed about the same amount. For the third test, surprisingly, teenagers took the lead, memorized the most, and were used to the pressure being put on. Overall, I saw that the teenagers performed an excellent job on all the tests.

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Abstract: Science and Engineering Fair of Houston

1043

Why Do We Follow The Crowd? Investigating Decision Making in Groups Among Teens

Serenity Morrow

Houston ISD/BCM Academy at James D Ryan - MS

Category:

Behavioral and Social Sciences

I wanted to see if group size changes how middle school students go along with each other. My question was, "How can group size affect decision making in middle schoolers." I inferred that as group size increased so would conformity. I tested 11 people in two groups, one with 4 people and one with 7. I asked them 3 open ended moral and ethical questions related to conformity. First, they wrote down their answers. Then they shared them out loud while I watched to see if they stuck to their own answer, repeated someone else, or changed it. In the small group, not many changed their answer with about 25% (1 person) conforming each trial. The bigger group was different. At first, no one changed their answer, but as we went through the questions, more students went along with the group. By the last question, about 71% has changed. This shows that bigger groups make students feel more pressure to follow what others say. This is important because it helps us see how peer pressure works and how teachers can make students feel okay sharing their own ideas. In conclusion, group size does influence decision making in middle schoolers, supporting my hypothesis. In the future, to expand on this project I could test more students and ask more questions.

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Abstract: Science and Engineering Fair of Houston

1044

Are Younger People Better At Recognizing AI Generated Images Than Older People?

Catherine Susanto

Conroe ISD /McCullough Junior High

Category:

Behavioral and Social
Sciences

The purpose of this study was to investigate whether age and increased interaction with Artificial Intelligence (AI) generated content affect the ability to recognize AI generated images compared to real pictures. To carry out this study, an online survey was created to gather responses from participants ages 10 to 70. Participants were asked to answer 14 questions, each containing a picture that was either AI generated or real. Participants were also asked how many minutes per day they interact with AI generated content. Unlike similar studies, this study actually surveyed minors ages 10 to 18. A total of 595 responses were collected over a one week period after distributing the survey through several community social media groups in the Woodlands and Conroe areas. The results showed an average of 1.5 questions in difference in score between the youngest age group (10 to 19) and the oldest age group (60 to 70), with average scores decreasing as participant age increased. In contrast, across the different AI usage intensity groups there was minimal and therefore negligible difference in score. These findings confirmed that younger people are better at recognizing AI generated images than older individuals. Spending more time interacting with AI generated content however, does not improve the ability. The findings highlight the need for increased awareness for older individuals who may be more vulnerable to deception involving AI generated images.

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Abstract: Science and Engineering Fair of Houston

1045

Reducing Misinformation Through AI Detection Training

Ojal Pawar

Conroe ISD /McCullough Junior High

Category:

Behavioral and Social
Sciences

This study tested whether a short training checklist improved the recognition of AI-generated images. Fifty participants across three age groups looked at twenty-five images and selected whether they believed the image was real or AI-generated. Participants who were in the training group had an average accuracy of 60% percent compared to the control group, which had an average accuracy of 55%. Despite the training checklist, the accuracy percentages were almost the same, proving that the AI images were misleading. Also, people who had a lower accuracy had put 5 for the confidence, and people who had a higher accuracy put a 1 for the confidence, showing that participants were not certain, and the AI images were very misleading. This project showed that the need for proper education to reduce misinformation is necessary.

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Abstract: Science and Engineering Fair of Houston

1046

Music Memory

Audrey Garza

Clear Creek ISD /Brookside Intermediate School

Category:

Behavioral and Social
Sciences

The purpose of this project is to figure out what genre of music is best to listen to when trying to memorize something. The reason for this was because many people struggle with memorizing things. So, the project was designed to help people with memory problems. The hypothesis was that "if the music genre is changed to instrumental/classical music then, more of the shape pattern will be memorized." Because from the articles read about classical music was said to be good for focusing because there were no lyrics. The data was collected at researcher's house for four days and each day one trial of data was collected. The hypothesis made was proven wrong by the data recorded. The result was, the best genre to help with memorization was the genre indie, with an average of remembering the pattern of 5.54 patterns. The lowest was 4.6 average of remembering the pattern. This science fair project contributed to people who need help in memorizing things.

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Abstract: Science and Engineering Fair of Houston

1047

Phone Free Schools?

Mitsuo Symons

Conroe ISD /Knox Junior High

Category:

Behavioral and Social
Sciences

In June 2025, Texas enacted House Bill 1481, banning student cell phone use during school hours for 5.8 million students. This study investigated improvements in students' well-being in areas of sleep, social interaction, grades, mental and emotional health, and physical health if schools/ school districts implement a cell phone ban, as excessive cell phone use is linked to poor mental health in adolescents, based on the hypothesis. The study surveyed 50 middle school students across two different schools: one in Texas that enforced a cell phone ban and one in Michigan that permitted cell phone use. A survey was created, tested, and administered, and the resulting data were analyzed by a single researcher. The findings did not support the hypothesis, as both groups reported similar results across most categories, indicating minimal benefits from the ban. The researcher noted limitations, including a small sample size, reliance on self-reported data, and the short timeframe of only three months after the ban's implementation. These factors suggest that broader studies with more participants, diverse locations, longer observation periods, and various grades of students are needed to draw definitive conclusions. Despite these limitations, the study raises questions about the effectiveness of a cell phone ban and its impact on student well-being. Future research could influence policy decisions, potentially leading to adjustments or alternative guidelines rather than strict bans.

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Abstract: Science and Engineering Fair of Houston

1048

How does Sleep Affect your Heath?

Kevin Zhang

Conroe ISD /McCullough Junior High

Category:

Behavioral and Social
Sciences

To summarize, this project was preformed to determine the amount of time that would prove most beneficial for society. The results indicate that obtaining approximately seven to nine or more hours of sleep per night is generally optimal. To collect data, I surveyed 30+(-may vary[some signatures are not uploaded yet]-) people to determine sleep habits and factors influencing sleep quality. Uses of stimulants(caffeine), pulling "all nighters", and screen time before designated night hours can impact the amount of sleep and the quality of sleep people have. Through my survey, I have gathered that brain growth or brain development, emotional regulations, and mental well being can be effected through the quantities of sleep received. Things like recovering from injuries, amounts of energy, and relying on caffeine to stay awake shows change depending on the amount of sleep. This goes on to prove that things such as mental, emotional, and physical growth will be limited if not enough sleep is provided to an individual.

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 Vertebrate animals microorganisms rDNA tissue

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- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

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- yes no



Abstract: Science and Engineering Fair of Houston

1049

Does Gender and Age Affect the Effectiveness of Breakfast?

Hayden Nguyen

Charter/SST - Champions College Prep - MS

Category:

Behavioral and Social
Sciences

My project investigated whether or not gender and age may play an effect on how our body reacts to breakfast. It is a continuation from my project from last year, where I researched to find out whether or not breakfast can have an effect on us in general. I gathered data for my project through research and surveys. My project is important because it can help inform others about the importance of breakfast.

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- yes no



Abstract: Science and Engineering Fair of Houston

1050
PeerSense: Predictive Modeling of Substance Use Risk Based on Peer Pressure Susceptibility in Adolescents
Vihaan Shah
Tomball ISD/Creekside Park JH

Category:
Behavioral and Social Sciences

Substance abuse among adolescents is a significant public health concern which arises from a complex interplay of psychological, environmental and social economic driving factors. Although existing research recognizes peer pressure as a major driver, quantitative tools that measure susceptibility and estimate substance use risk remain limited. In this study, multiple secondary datasets containing demographic, socioeconomic and psychological traits in adolescents were analyzed. Pearson correlation analysis was conducted to identify statistically significant variables and identify the feature set associated with substance use vulnerability. Preliminary results showed that peer pressure susceptibility had the strongest correlation followed by impulsivity and fear of exclusion. A machine learning model using Random Forest classifier was then trained using these selected features to predict individual risk of substance use. Finally, a prototype self-screening application was developed to collect individual primary data through real-life scenario questions and deliver personalized assessment and coping strategies. These findings demonstrate the feasibility of using this tool for predictive modeling to support early screening efforts and thereby prevention for substance-use in adolescents.

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- yes no



Abstract: Science and Engineering Fair of Houston

1051

From Snack Time to Lifetime: Study on Dietary Glycemic Index in children and its Impact on Cognitive Functions

Niya Yerramadha

Friendswood ISD /Friendswood Junior High

Category:

Behavioral and Social Sciences

“Snack Time to Lifetime” Effects of Dietary Glycemic Index on cognitive performance in middle school Children By: Niya Yerramadha *This study is based on data collection using computational methods.* Dietary GI may impact cognitive functioning in middle school students. This within-subjects crossover study examined the effects of high-calorie glycemic index vs. low-calorie glycemic index meals on cognitive performance, behavioral responses, and metabolic markers in 30 students (11-14 yo). Participants consumed HGI meals (800-1200 cal; white bread with jam) and LGI meals (300-600 cal; whole grain toast with oats) on separate days, with a one-week washout period. Blood glucose and cognitive performance (working memory, processing speed, & attention) were measured at 30 and 90 minutes post-meal. The significant differences in blood glucose response was: high glycemic index (123.1 mg/dL) vs. low glycemic index (100.2 mg/dL) at 30 minutes. The cognitive performance improved on the low glycemic index meal, with a +9.2 point advantage in memory at 30 minutes and +3.9 point advantage at 90 minutes. Similar patterns were observed for attention and processing speed. The memory was tested using the N-Back Test; the processing speed was measured by directing the participant to press a button as soon as a light appeared; and the attention was measured using the Stroop Color and Word test. The LGI meal was associated with better cognitive performance, suggesting that the dietary GI affects acute cognitive function. These findings have implications for school meal planning and academic performance, highlighting the importance of lower-calorie, lower-GI meals for optimal cognitive function in adolescents and its effect on later life.

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- yes no



Abstract: Science and Engineering Fair of Houston

1052

The Endowment effect

Hania Hussaini

Clear Creek ISD /Brookside Intermediate School

Category:

Behavioral and Social
Sciences

The endowment effect is beneficial to understand because it explains the psychological reaction individuals have when parting with objects of sentimental value. The purpose of this experiment is to show how the endowment effect influences the value that individuals place on objects of sentimental value compared to the value they placed on objects with no sentimental value. If people from different races practice letting go of personal possessions, then those items' value will dwindle and result in less attachment, furthering the idea that the endowment effect greatly inflates an object's value. Participants assigned values to sentimental and non-sentimental objects across multiple scenarios to measure differences in valuation. Of the 21 participants in the experiment, all of them placed a higher dollar value on objects of sentimental value than the control objects with no sentimental value. The result of the experiment is demonstrated on the Pre-Interview and Post-Interview graph. After participants were repeatedly asked to part with their objects of sentimental value over a three-day trial, results showed the decline in value of those sentimental objects. The results of the experiment demonstrated that the endowment effect plays a critical role in the value that individuals place on their personal belongings compared to goods that hold no sentimental value. However, if individuals are asked to part with their possessions over time, they allocate an inferior desirability to those objects. This effect was seen amongst all race groups that participated and concluded with the hypothesis being proven correct as well as the objective.

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- yes no



Abstract: Science and Engineering Fair of Houston

1053

Working with Motivation: Exploring the Causes and Effects of Burnout

Violet Washburn

Clear Creek ISD /Bayside Intermediate School

Category:

Behavioral and Social Sciences

For this project, I wanted to understand what burnout looks like in adults and whether taking breaks and using stress management strategies help. My hypothesis was that people who take breaks and use coping strategies would have lower levels of burnout. I created an online survey and collected 62 responses from adults. The survey asked about work conditions, physical and emotional symptoms, and what strategies people use to manage stress. I then compared burnout levels between people who reported using breaks and coping strategies and those who did not. The results did not fully support my hypothesis. People who used breaks and stress management strategies were just as exhausted as those who didn't, and sometimes more. Strategies like exercise and mindfulness showed small positive effects. Overall, the data shows that burnout is caused more by heavy workload, constant changes, and poor work-life balance than by a lack of coping skills. This means that individual strategies may help, but real change requires improving the work environment itself.

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- yes no



Abstract: Science and Engineering Fair of Houston

1054

Music, Not Timers: The Effects of Non-Essential Stimuli on Middle Schoolers' Task Performance

Elizabeth Ellis

Houston ISD/BCM Academy at James D Ryan - MS

Category:

Behavioral and Social Sciences

In this project my results did not match up with my hypothesis as I stated that the non essential stimuli wouldn't have a major effect on the task performance but the classical music performed the best out of the no non-essential stimuli, classical music and the timer beeping every 2 minutes. According to my results the classical music did the best out of the rest with a 93 average unlike the other scores of 65 and 65. I tested 3 groups, one with classical music playing in the background, nothing to listen to, and a timer beeping. So as my hypothesis stated that it would have no major impact, it was wrong because classical music did the best out of the groups. I made sure they were all in the same room with similar conditions but still changing the non-essential stimuli. You would want to make sure that the conditions are the same so the variables don't change or alter. If you were to have the testing groups in different testing environments it could hinder their ability to perform their best even with the non-essential stimuli. In my results the classical music shocked me the most because in my hypothesis i stated that it wouldn't have a major impact but when I tested it the classical music seemed to do the best, what also shocked me was the regular room with no non-essential stimuli because i stated that that group would've done the best out of the three groups.

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- yes no



Abstract: Science and Engineering Fair of Houston

1055

Lock In: Limited Phone Use Significantly Improves Numerical Memory Among Teens

Aliyahnelly Mercado

Houston ISD/BCM Academy at James D Ryan - MS

Category:

Behavioral and Social Sciences

The results I have noticed that I was correct because most of the teens had a harder time telling me the numbers that they remembered when they were on they are phone. When they started to get more and more focused on their phone, it was like they forgot more and more of the numbers. But when they weren't on their phone they had a way more easier way to tell me what they had remembered, it was like they were really concentrated on the number.

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- yes no



Abstract: Science and Engineering Fair of Houston

1056

The Power of Words and Emphasis

Thereasa Pickney

Charter/SST - Champions College Prep - HS

Category:

Behavioral and Social
Sciences

This project is important because words with emphasis change the brain's processing and emotions. Background information includes Newberg (2012) study that showed that a single word can affect stress genes and Seligman (1975) study that showed learned helplessness from negative language. Evidence includes: Emphasized statements caused 83.3% strong reactions vs. the 50% neutral without within the two parts of the experiment. Scientifically, it furthers emotional communication and understanding. Societally, it promotes more careful speaking in jobs like teaching and media roles. My hypothesis was that the words people use, along with emphasis, directly influence the brain's emotional processing." The research questions are: Do words/emphasis impact people? Do they differ without emphasis? Does positive use benefit lives? And my expected outcomes are stronger reactions with emphasis, than with the nonemphasized (83.3% negative or positive vs 50% neutral), which data supported. This relates to project choice by demonstrating words' real power on the brain/emotions. The data was analyzed by comparing reactions using tables and line charts. The emphasized statements showed 3 positive, 1 neutral, and 2 negative (83.3% strong effects) responses to the statements. The non-emphasized statements showed 1 positive, 3 neutral, and 2 negative (50% neutral) responses to the statements. And finally, percentages had proved that emphasis strengthens emotions, supporting my hypothesis. And there were no formulas needed in this experiment.

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- yes no



Abstract: Science and Engineering Fair of Houston

1057

Small Changes, Big Impact: Lifestyle Improvements That Transform Blood Sugar

Riona Hiwale

Private/ST. JOHN'S SCHOOL

Category:

Behavioral and Social
Sciences

Diabetes is a widespread health condition that requires careful monitoring and control of blood glucose levels to prevent complications. The purpose of this project, Small Changes, Big Impact: Lifestyle Improvements That Transform Blood Sugar, was to investigate whether small, practical lifestyle changes could improve blood sugar management in an adult with diabetes. One participant took part in the study, following a structured daily routine designed to test the effects of meal order, physical activity, and stress management on blood glucose. The participant consumed two meals per day, always starting with fiber-rich foods first, followed by the rest of the meal. In addition, the participant performed daily walking and practiced breathing exercises for 15 minutes in the morning and 15 minutes at night to help reduce stress, which can affect blood sugar levels. Blood glucose was measured at least five times per day, including fasting in the morning, before lunch, two hours after lunch, before dinner, and two hours after dinner, using a personal glucose monitor. In addition, HbA1c was measured using an at-home testing device to evaluate average blood sugar levels over time. All data was collected and recorded in a spreadsheet, and trends were analyzed using tables and graphs to determine the impact of the lifestyle changes. The results showed a clear improvement in blood glucose levels and HbA1c over the study period, suggesting that eating fiber first, limiting meals to two per day, incorporating daily walking, and practicing breathing exercises can positively affect blood sugar control. These findings indicate that simple and manageable lifestyle adjustments can have a meaningful impact on diabetes management and may provide practical guidance for others seeking non-medical strategies to maintain healthy blood glucose levels. This project demonstrates that small, intentional changes in daily habits can make a significant difference in overall health.

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- yes no



Abstract: Science and Engineering Fair of Houston

1058 Fast Beats, Fast Feet? A Study on How Music's Tempo Affects Running Speed Caleb Adams Conroe ISD /Knox Junior High	Category: Behavioral and Social Sciences
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The purpose of this project was to determine if the tempo of music affects the performance and psychological experience of a runner during a 1-mile time trial. It was hypothesized that if the tempo of the music is not within the optimal range of 130–150 beats per minute (BPM), participants would not see an increase in their 1-mile performance. The study aimed to explore whether high-speed music would lead to premature burnout or if it would provide a necessary boost to improve speed. To test this, participants were assigned to run a 1-mile course under three distinct conditions: Playlist 1 (130–150 BPM), Playlist 2 (151+ BPM), and a control condition with no music. Following each trial, participants recorded their 1-mile completion time and their Rate of Perceived Exertion (RPE) using the Borg scale to quantify their subjective effort levels. A recovery period of 2–3 days was maintained between trials to ensure that physical fatigue from previous runs did not influence the data. Data examination revealed that the hypothesis was not supported, as the highest tempo produced the best results. Playlist 2 (151+ BPM) yielded the fastest average completion time of 10:28, compared to 10:47 for Playlist 1 and 11:07 for the no-music condition. While Playlist 2 resulted in the best performance, it also corresponded with the highest average RPE and energy levels. In conclusion, higher-tempo music acted as a powerful stimulant, allowing participants to achieve faster run times despite a higher perceived level of effort, suggesting that for short-distance runs, faster tempos are more beneficial for performance than the moderate 130–150 BPM range.

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Abstract: Science and Engineering Fair of Houston

1059
Is Social Media Really That Bad?

Laila Serag
Galveston ISD/Central Middle School

Category:
Behavioral and Social Sciences

Smartphones and social media use are a big part of students' lives. I wanted to check whether social media/screen time use affects students' sleep, exercise, and weight. I surveyed students at Central Middle School in Galveston using a Google Form to collect their age, grade, exercise frequency, bedtime, and time spent on their phones during the past week. I also measured their weight and calculated their BMI percentile. More than half of the students were Hispanic 13-year-old females who exercise ≥ 3 days/week and have a healthy weight. I found that students spend 30% more screen time on weekends than on weekdays ($p < 0.001$). They also sleep an average of only 7.1 hours per night, regardless of gender; a decrease of 13-29% from the recommended average for their age. The analyzed data did not show correlations between screen time and BMI, age, or between gender and sleep duration. In conclusion, screen time was not negatively associated with students' weight, sleep, or exercise. However, screen time was significantly higher on weekends, and the sleep duration was negatively affected. It is possible I couldn't find an association, as the majority of participating students were at a healthy weight and already active. More studies are needed, including a large number of students of various weights and activity levels.

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- Vertebrate animals
- microorganisms
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- no



Abstract: Science and Engineering Fair of Houston

1060

When Noise Competes for Attention: The Cognitive Effects of Loud Background Noise on Memory Recall and Selective Attention

Naya Abu-Shahin

Private/Houston Quran Academy - Spring - MS

Category:

Behavioral and Social Sciences

This project was designed to test how background noise influences cognitive functions, specifically memory recall and selective attention. The independent variable was the presence of loud auditory background noise, while the dependent variables were memory recall results and Stroop test performance, measured by completion time and errors. Participants ranged in age from 8 to 45 years, and although age-related differences in cognition may exist, a repeated-measures design was used so that each participant served as their own control, minimizing the impact of individual differences. The materials used in this experiment include word recall lists, Stroop test sheets, a data collection sheet, a timer + stopwatch, and a speaker used to create controlled noise conditions. Results showed that loud noise altered cognitive performance, particularly during the Stroop task, where many participants demonstrated longer reaction times and increased errors, while memory recall results were more variable across individuals. The hypothesis that loud noise would decrease memory recall and selective attention was partially supported, as noise affected participants differently rather than producing a consistent decline in performance. Overall, the findings suggest that background noise influences cognitive processing by increasing mental strain for some individuals, while others adapt or even feel more comfortable performing tasks in noisy conditions, which highlights the complex and individualized nature of human attention.

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Abstract: Science and Engineering Fair of Houston

1061

Tick Tock, What Should We Do with our Analog Clocks?

Ariel Anderson

Houston ISD/BCM Academy at James D Ryan - MS

Category:

Behavioral and Social
Sciences

Our world is becoming more digital with the use of smartphones and smartwatches. I noticed that students interrupt class to ask for the time if there is not a digital clock. My first question is: How does the use of a digital clock versus an analog clock in a classroom affect the amount of disruption there is? My hypothesis is that a classroom with a digital clock will have fewer interruptions than a classroom with an analog clock. My second question is: Will people less than 19 years old read an analog clock less accurately than other age groups? I hypothesize that people less than 19 years old will be the least accurate at reading an analog clock. To answer these questions, I went into two different classrooms (one with an analog clock and another with a digital clock) and recorded how many people asked for the time for five class periods. I then asked people to read an analog clock set to 3:35. My results were that the classroom with the digital clock had fewer interruptions from people asking for the time. This supports my hypothesis. The youngest age group (age <19) was the least accurate at reading analog clocks. This also supports my hypothesis. Although some children do not know how to read an analog clock, they still understand concepts of time. The findings matter because teachers can use this information to decide the best way to teach students time either using analog or digital clocks.

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Abstract: Science and Engineering Fair of Houston

1062

Brain Interference

Tam Nguyen, Thien Tran

Alief ISD/Alief MS

Category:

Behavioral and Social
Sciences

The purpose of this experiment is to determine whether or not age affects a person's performance when completing sets of Stroop Effect tasks. With the Stroop Effect being a phenomenon of cognitive psychology, this experiment digs deeper to find out whether a middle school student, high school student, or adult will be least affected by the Stroop Effect. After completing the trials, we concluded that the middle school students were least affected by the Stroop Effect (average of 21.54 seconds), completing the tasks in the least amount of time compared to the high school students (23.63 seconds) and adults (23.10 seconds).

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Abstract: Science and Engineering Fair of Houston

1063

Video Games and Reaction Time

Julian Zamora

Charter/SST - Champions College Prep - MS

Category:

Behavioral and Social
Sciences

Did you know that video games can increase and benefit your reaction time? This is important because video games can affect your life in many different ways. You can obtain lots of beneficial skills through playing video games. Many people that play video games often are affected by this heavily and show quick growth on many things. Now, how do video games actually help you at all? This project mainly informs us about how playing video games could speed up our reaction time. This uses human participants for a simple reaction time test. The main participants needed for this are people who do not play video games, and people who do play video games (Mainly high action games that require you to think quickly). The participants will be timed and organized into those 2 groups. Data will be collected to conclude each groups reaction time.

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Abstract: Science and Engineering Fair of Houston

1064

How does age affect motor processing in age

Kayla Rodriguez

Houston ISD/BCM Biotech Academy at Rusk - MS

Category:

Behavioral and Social
Sciences

In this experiment I wanted myself and others to find out how age can affect reaction time in the different stages of life. Many people have felt slower as they age so this experiment is meant to help people understand their reaction time with their specific age group and maybe prepare for it in the said future by doing certain mind training exercises. I had 7 groups of 5 people with the age groups being: Children, Teens, Young Adults, Adults, Mature Adults, Seniors and Elders. I had an experiment where each age group had to catch a ruler without knowing when it was going to drop and looking directly at the tester. With an equation I could find out the average reaction time of each group. The results of this experiment were what you can say very surprising, in the lead adults had the fastest reaction time, with it then being young adults, mature adults, teenagers, elders, seniors, and lastly with the slowest reaction time is children. This experiment showed us that people tend to have faster reaction times when they are in the adult stage and young adult stage and slower nearing their child years and senior years.

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2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1065

Decoding Social Deficits: Using Multimodal AI to Accelerate Autism Spectrum Disorder Diagnosis & Care.

Shruthi Ram Kumar

Fort Bend ISD /Quail Valley Middle School

Category:

Behavioral and Social Sciences

Autism Spectrum Disorder (ASD) is a chronic neurodevelopmental disorder that primarily affects communication, social interaction, and behavioral patterns. The term spectrum reflects the wide range of symptoms and varying degrees of severity typically observed from early childhood. Early detection is critical because the developing brain exhibits high neural plasticity, meaning timely intervention can significantly improve long-term outcomes by guiding neural development during early formative years. While brain MRI scans can reveal anatomical differences associated with ASD, they are often too expensive, inaccessible, or considered too intense for young children, leading many families to avoid them. Another prominent problem that we see today is that there is no proper acute care for autistic kids in stress environment settings like an emergency room. To address this limitation, the goal of this project is to develop a non-invasive, AI-assisted early screening tool for ASD. This project uses artificial intelligence to map correlations between brain anatomical features and external phenotype data. The primary objective of this project is to develop a non-invasive, multimodal Edge AI application that integrates behavioral scores, brain-MRI data (structural, functional and neuroimages), cognitive and adaptability test results (DAS II, WASI, Vineland), Autism specific test scores (SRS, RBS, CARS) to accelerate early ASD detect to enhance diagnostic accuracy, the AI-based model will be further correlated with standardized physician-evaluated behavioral questionnaires commonly used in ASD screening. Additionally, to integrate a biochemical biomarker into the screening model, this project will measure oxytocin levels in saliva—a hormone known to influence social bonding and emotional regulation. A proteomic-based colorimetric assay will be designed to quantify oxytocin as supportive evidence for ASD risk detection.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

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