Abstract: Science and Engineering Fair of Houston

3033

Utilizing Large Language Models to Detect Linguistic Markers of Anxiety in Low-Resource Languages

Andrew Haynes, Adeela Law

Conroe ISD /AST: Academy of Science and Technology

Category:

Behavioral and Social Sciences

Despite approximately 3 billion low-resource speakers globally, current natural language processing solutions are specialized on a mere handful of high-resource languages. In this project, researchers evaluated large language models (LLMs) on their accuracy identifying linguistic signals of anxiety in Malay- and Arabic-language social media posts using zero-shot prompting strategies to bridge this linguistic divide. Using annotated Malay- and Arabic-language social media data, the researchers hypothesized that role-based prompts with prior linguistic context would significantly improve anxiety detection in low-resource languages. Each model was tested under two prompting strategies within a binary classification framework, with the models' output compared with ground truth data. Across the different large language models (ChatGPT, Gemini, DeepSeek), employing more advanced prompting (Prompt 2) consistently improved performance, especially F1-score and the balance between precision and recall. For example, implementation of Prompt 2 increased F1 by ~15–30 points (e.g. ChatGPT–Malay 0.68 -> 0.89 and DeepSeek–Malay 0.84 -> 0.90) and boosts accuracy by ~7–27 percentage points. Gemini performs best and most consistently, ChatGPT is highly prompt-sensitive, and DeepSeek tends to favor high recall at the expense of precision. Performance drops substantially in Arabic compared to Malay, potentially attributed to the fact that Arabic is a non-Roman script, morphologically complex, and highly dialectal, with F1 scores as low as 0.17-0.27. Ultimately, this project demonstrates that carefully optimized zero-shot prompting can serve as a low-cost, scalable alternative to model retraining for multilingual mental health analysis on social media, including low-resource and non-Roman languages.

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.

[X] yes [ ] no

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

[X] yes [ ] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3034

Mind Manipulation

Category:

Behavioral and Social Sciences

Jayda James, Hennsley Lively, Phoenix Haddad

Conroe ISD /ASHP: Academy for Science and Health Prof

The purpose of this experiment was to find out if outside suggestions could change what people remember about an event. This topic is important because eyewitness memory is often used to explain what happened in real-life situations. We predicted that participants who were given false information would remember more things that did not actually happen than participants who were not given any misinformation.Twenty participants were divided into four groups of five and watched a 45 second video of a car accident. Some groups were exposed to misleading information after the video, while others were not. All participants then answered questions about what they remembered.The results supported our hypothesis. The control groups had higher and more consistent average scores, such as Group B2, which had the highest average score at around 90. In comparison, the groups exposed to misinformation showed lower average scores, especially Group B1, which had an average score of about 70. This shows that participants who heard false information remembered fewer correct details and more incorrect ones. Overall, the data shows that misinformation can negatively affect memory and cause people to remember events that never actually happened.

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

[X] 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.

[X] yes [ ] no

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

[X] yes [ ] no

4. This project is a continuation of previous research.

[X] yes [ ] no

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

[X] 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.

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3035

Category: Behavioral and Social Sciences

Words That Matter: Investigating whether general Large Language Models (LLMs) or mental-health specific AI platforms produce semantic similarity in language aligned with experience reports of 'helpful' or 'harmful' support in cases of suicidal ideation

Irene Qian, Aditi Venkataraman

Conroe ISD /AST: Academy of Science and Technology

Every 11 minutes, one individual loses their life to suicide, contributing to over 700,000 reported suicides annually. As therapeutic support services progressively become scarce and less accessible, it is increasingly common for those struggling with suicidal ideation to turn to general artificial intelligence (AI) platforms to seek advice. While AI-based therapy offers a low-cost and readily available alternative to traditional therapies, previous research suggests that these are uninformed products, not trained professionals, that lack the ethical oversight to handle intimate therapeutic relationships. Given the elevated use of AI as a therapeutic proxy, understanding how these generative responses align with supportive patient care warrants further investigation. This study evaluates whether patient reports of "helpful" or "harmful" care in specialized therapy are lexically and semantically aligned with artificially-intelligent responses. Experiments were conducted using Linguistic Inquiry and Word Count software (LIWC-22), with the creation of custom dictionaries to encompass "helpful" and "harmful" language derived from patient narrative reports. Prompts for AI platforms (ChatGPT, Gemini, Earkick, and AI Psy Help) were generated using clinical transcriptions and suicidality datasets. AI-generated responses were then analyzed for percentage of lexical and semantic alignment, with comparisons made across groups, including general-purpose versus mental-health specialized AI, and AI models versus professional clinicians. Preliminary results suggest that ChatGPT and AI Psy Help offer the most "helpful" lexically-aligned support (mean percentage of "helpful" words of 8.32% and 7.34%, respectively). These findings provide insight into improving the societal approach to mental health and suicidal ideation treatment as a whole.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3036

Just Chat It: AI-Driven Academic Dishonesty in Level and Honor Students

Samra Kyalimpa

Conroe ISD /AST: Academy of Science and Technology

Category:

Behavioral and Social Sciences

The use of AI by students in academia to engage in academically dishonest behavior is a pressing issue in today's world. The ways in which AI can be beneficially employed in academia are vast, however so are the ways in which AI can be abused to undermine academic integrity. This study aims to investigate the underlying traits of AI driven academic dishonesty. In particular, whether level and honor students differ in their AI usage. A survey was created with questions testing for AI usage, perception, and purpose of use in high school students, as well as asking for demographic information on the respondent such as grade, age, gender, and the number of advanced and or level classes they were taking. Students were separated into “level” and “honor” groups and t-tests were run on the responses for every survey item. Based on 22 survey responses from high school students, the outcome of the statistical tests all indicated no significant difference, showing that the volume of AI usage, perceptions of AI, and purposes of use were all relatively similar. These results show that there is no significant difference in the AI usage between honor and level students.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3037

Musical Testing

Mary Sobowale

Fort Bend ISD /Hightower High School

Category:

Behavioral and Social Sciences

Many students have been told that listening to music while completing assignments hinders their progress. Some teachers echo this sentiment while others deny it. This project, however, could be the start to providing a realistic standard for teachers as to what type of music they could play in their classroom during certain activities. The hypothesis for this experiment was that pop music with slower tempos improved student performance while taking a test, more than rap music. 3 anonymous participants engaged in a 20-minute lesson on seasons. After, they were each given a testing sheet and directed to separate rooms where they took the test. After reviewing the information, it was clear that slower pop music helped improve the student's score. While the student did take longer, they had a higher score by 10%. However, the slower pop music did not help the student score higher than the control. These results showed that slower pop music wasn't a complete distraction during testing and could be useful. They also showed that while music could be used, it wasn't guaranteed to improve performance. This data from this test is important because other experiments can use it as a start, and it could be further elaborated and expanded on.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3038

Study of a Solution to Take Back Control from Electronics

Category:

Behavioral and Social Sciences

Sivapriya Kannan

Conroe ISD /AST: Academy of Science and Technology

The purpose of electronic consumption is meant to make entertainment and education more accessible to our needs, but studies have shown the negative aftermath of it, on youth and adolescents especially. Some people consider technology dependence as unproductivity, which it can be, but the more revealing aspect of it is that it has ultimately diminished the value of human interaction, worthwhile endeavors, and time itself. In response to this rising, overarching issue in the current digital age, a set of procedures was tested restricting the technology consumption of 27 teen participants to evaluate any change in their lifestyles and certain aspects of their health over the course of 10 days. The questionnaire they answered had 9 questions from the SNAP-IV Attention and Focus Scale, but the rest were Likert scale questions assessing 27 different variables, including anxiety, enjoyment, efforts, and results in academics and extracurriculars, distractions, homework completion speed, and relationships with friends and family. The conclusions fulfilled the hypothesis that the participants would improve in the majority of the variables being experimented, because all 27 of the variables had improvement, with the largest being 110% advancement in easiness of homework completion. This was determined by calculating the average percent increase of scores from the questionnaires. The results shown incentivize a need for youth to reevaluate how much time is going by from the unnecessary uses of technology and to help find a homeostasis between productivity and doing what they love, even with the presence of electronics.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[X] yes [ ] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3039

The Effect of Old Age, Dementia, and Alzheimer's On Depression and Loneliness

Taylor Anthony, Major Roeser

Private/ST. JOHN'S SCHOOL

Category:

Behavioral and Social Sciences

As the global population ages, the frequency of dementia and Alzheimer's disease continues to rise, bringing cognitive, emotional, and economic problems for individuals, families, and healthcare systems. Our project is about the effects of old age, dementia, and Alzheimer's disease on mental health, with a particular focus on loneliness, depression, and declining cognitive function. Found by online sources and public health data, the analysis sets Alzheimer's disease as the most common form of dementia, due to progressive neurological changes such as protein plaque accumulation, neuronal loss, and brain shrinkage. These biological changes are closely linked to behavioral and psychological symptoms that reduce quality of life and increase the burden on caregivers. While exploring solutions, we created the idea for a robot to increase the longevity of a brain with Alzheimer's, as well as limit caregiver help. The robot has a memory-based game that challenges users to recall and repeat progressively complex patterns, with the goal of stimulating cognitive engagement, attention, and short-term memory. In addition to cognitive stimulation, the robot is intended to provide consistent interaction, reminders, and emotional support, addressing both mental health and daily care needs. The expected outcome is that aging, dementia, and Alzheimer's disease have a clear negative impact on mental health, while technological interventions may help slow cognitive decline and reduce feelings of isolation. By combining behavioral science with technology, this research highlights a practical approach to improving the well-being of older adults affected by this neurodegenerative disease.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[X] 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.

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3040

Category: Behavioral and Social Sciences

The Effectiveness of Rhythmic Auditory Stimulation (RAS) on Gait Performance in Patients with Neurological Motor Impairments

Aaryan Hussain

Fort Bend ISD /Clements High School

The impact of rhythmic auditory stimulation (RAS) on gait performance in patients with neurological conditions is examined in my project, "The Effectiveness of Rhythmic Auditory Stimulation (RAS) on Gait Performance in Patients With Neurological Motor Impairments." The research question I asked was, “How does synchronizing movement with an external rhythmic cue (music or metronome), a technique used in physical and music therapy, influence gait speed and stride length in individuals with motor impairments?” My hypothesis was that if individuals with motor impairments walk with rhythmic auditory cues, then their gait speed and stride length will improve since the external beat promotes better motor timing and coordination. This research examined how auditory-motor synchronization helps gait rehabilitation by providing rhythmic cues to improve timing, coordination, and walking consistency in individuals with neurological impairments and whether RAS improves gait across the published studies. Materials included peer-reviewed studies on RAS and gait in patients with neurological conditions that examine the effects of auditory cues on walking speed, stride length, and cadence. From this research, I was able to compare the baseline and RAS gait measurements by using tables, percent-change calculations, and bar and line graphs to demonstrate improvements. The independent variable was the presence of RAS. The dependent variables were the gait speed and stride length reported. Controlled variables were the type of patient population, auditory cue used, and the measurement method. The control condition was the baseline gait measurement, and the experimental condition was gait measurement. With this study, I concluded that RAS improves gait speed, stride length, and overall motor coordination in patients with neurological impairments, providing strong evidence for effective, accessible, and low-risk rehabilitation strategies that integrate auditory cues into clinical therapy.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3041

Postpartum Depression in Medical Television: A Data-Driven Gap Analysis

Nuha Dhuka

Clear Creek ISD /Clear Lake High School

Category:

Behavioral and Social Sciences

Postpartum depression (PPD) is a serious mental health condition affecting many women after childbirth. This project was designed to test the hypothesis that if pregnancy, birth, and postpartum episodes are analyzed across four major medical TV dramas (Grey's Anatomy, The Resident, The Good Doctor, and House M.D.) then The Resident will depict postpartum depression most accurately. To conduct the analysis, episodes were selected based on confirmed pregnancy, birth, or postpartum scenes. Each episode was coded using DSM-5 criteria for depressive symptoms and the Edinburgh Postnatal Depression Scale (EPDS) to measure severity. The results were compiled into tables and graphs comparing symptom presence and intensity across shows. Results suggest the hypothesis was overall correct. The Resident had the most sustained and clinically realistic depiction of PPD through Padma Devi's multi-episode arc. House M.D. and Grey's Anatomy showed moderate and mild portrayals respectively, with fewer symptoms and lower EPDS averages. DSM-5 symptoms such as depressed fatigue, functional impairment, and depressed mood were most common, while suicidal ideation appeared less frequently but was most evident in The Resident. Overall, The Resident and The Good Doctor proved most effective in portraying postpartum depression with both emotional depth and clinical accuracy. Further research could explore how other mental health conditions are depicted in medical dramas or expand the dataset to include non-medical shows. This project highlights the importance of accurate media representation in shaping public understanding of postpartum mental health.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3042

Category: Behavioral and Social Sciences

Neurofy, Year II: A Novel, Multimodal Machine Learning System for Continuous Detection of Neurodegenerative Diseases and Adaptive AI Cognitive Support via Behavioral and Linguistic Pattern Analysis

Dylan Ma

Conroe ISD /AST: Academy of Science and Technology

Neurodegenerative diseases (NDDs) claim the lives of nearly 11,000,000 people annually. Despite its worldwide impact, the continuous diagnosis of NDDs remains delayed, inaccessible, and socially stigmatized. Treatment options are also limited, blocked by high costs, inequity, and a lack of personalization. This study developed a new approach to the crisis, creating a multimodal system to both continuously detect NDDs early from several potential behavioral and linguistic biomarkers and provide real-time, long-term cognitive support, potentially mitigating symptoms and slowing disease progression. Built upon hundreds of digitally scraped spontaneous audio files, including dementia, Parkinson's, and ALS patients, ten robust classification and hybrid models were tested, with a Long Short-Term Memory model (LSTM) achieving 91.7% accuracy at predicting NDDs based on behavioral features and a Bidirectional Encoder Representations from Transformers (BERT) reaching 94.3% at the same task utilizing linguistic attributes. Furthermore, in-depth feature analysis was conducted, validating jitters, syntactic complexity, and reduced thematic coherence as viable biomarkers for several NDDs. For long-term aid, a GPT-based model was used, seamlessly integrating cognitive therapy principles. The finalized models were deployed into Neurofy, a comprehensive platform for accurate disease assessments and personalized cognitive support. Neurofy is designed to detect cognitive decline early and slow its development, facilitating extended monitoring and support. The system also stores information in a retrievable database available to healthcare providers, enabling data-driven decision making and more informed and targeted treatment strategies. This study is a promising solution to NDDs, potentially addressing the needs of millions around the world.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[X] yes [ ] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3043

Equine-Assisted Therapy

Lamiya Rafiq

Clear Creek ISD /Clear Brook High School

Category:

Behavioral and Social Sciences

My topic is over Equine therapy and how there is a specific type of horse therapy that is more benificial from the rest. The reason I chose to study this was because I have personal connection with people who have needed Equne theraoy but they wasred their time on the wrong from of EAT. My hypothesis remain as I belive riding a horse will have the most positive effects because that is where the human remains closest to the horse. I carried out my expeirement by proposing 4 different control groups and giving each participant in each control group the same set of survey questions fro before and after the experiement. I then used the data to determine which control group had the most positive effects. The results that were found was feeding the horse and ridding the horse were the top 2 best results for horse therapy, but ridding the horse ultimatly outscored the feeding control group. This supports my hypothesis,becasue riding the horse has the most positive effect. The implications of this would be tailored to your need on horse therapy, for example I was testing for behaviorial attributes, but if you have a physical disorder than the same control group may not work. Some applications are it would save people who need emotianl therapy more time, becasue it narrows down the exact form of therapy that can help the pateint.

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

[X] Human participants [ ] potentially hazardous biological agents

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[X] 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.

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3044

Connected or Distracted? The effect of cell phones on student success.

Ana Espitia, Lyzandra Lobato, Maya Correa Romero

Conroe ISD /ASHP: Academy for Science and Health Prof

Category:

Behavioral and Social Sciences

The purpose of this project is to determine whether the phone ban has affected students' grades. This is important because it gives an idea of how the new phone ban affects students. One of the difficulties we face is the diversity of the student's personality, as not all students react in the same way to the new law. Our research question and hypothesis are how has students' academic performance changed after the implementation of the new law? Null Hypothesis, There is no statistical difference in the academic performance of high school students with and without the cell phones Alternative hypothesis, There is a statistical difference in the academic performance of high school students with and without the cell phones. Our project will not use surveys, questionnaires, or exams. We will obtain the data from our mentor, and with that information, we will perform the calculations and create bar graphs. The most important findings of our project were that AP History students were not affected by the phone ban, but Level History students were affected. What these results mean is that, based on the calculations performed, no definitive conclusion can be drawn due to the lack of sufficient data. However, with the data available, the null hypothesis is accepted for the AP History students, while the alternative hypothesis is accepted for the Level History students. Overall the phone law ban affects each student differently.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3045

A gamified go/no-go paradigm replicates behavioral and neural signatures of inhibitory control in neurosurgical patients

Geoffrey Liu

Pearland ISD/Glenda Dawson - HS

Category:

Behavioral and Social Sciences

The go/no-go (GNG) task is a well-known paradigm for studying reactive inhibition. While traditional GNG tasks use repetitive presentations of letters or other visual stimuli, there is an inherent disconnect between standard laboratory assessments and the application of inhibitory control in naturalistic, real-life scenarios. In this study, a gamified GNG paradigm was developed to bridge the gap. Ten neurosurgical patients undergoing intracranial stereoelectroencephalography monitoring were recruited (three males, age range from 20 to 68 years). Single-unit neural activity was obtained through Behnke-Fried probes. Behavioral results demonstrated that the task successfully replicated key behavioral patterns seen in traditional paradigms, including faster reaction times for false alarms than for go-correct trials ($p = .001$), post-error slowing ($p = .03$), and slowing responses with increasing difficulty ($p < .001$). Single-unit recordings revealed diverse firing patterns, with neurons showing selectivity for trial type and temporal dynamics. Neuronal state-space analysis of orbitofrontal cortex (OFC) units (93 units across seven patients) showed condition-dependent trajectories that diverged between go and no-go trials ($p < .05$), aligning with existing evidence that OFC represents task states relevant for inhibitory demands. These findings validate the use of this novel task to investigate inhibitory control more naturalistically across difficulty levels and in association with different action values. Future work includes (1) extending the preliminary findings by analyzing data from a larger cohort of patients and across multiple brain regions; (2) testing for the effect of other task variables (difficulty, lives remaining, etc.); (3) performing within-participants comparisons of gamified and traditional GNG signatures.

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

[X] 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.

[X] yes [ ] no

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

[X] yes [ ] no

4. This project is a continuation of previous research.

[X] yes [ ] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3046

Investigating the Differential Effects of Nine SF-36 Quality of Life Domains and Short-Term Memory Task Difficulty on Cognitive Performance in Adults Aged 50–79: Implications for Recall Accuracy, Health Screening, and Replicable Behavioral Assessment

Ibrahim Mamedov

Houston ISD/DEBAKEY HIGH SCHOOL FOR HEALTH PROFESSIONS - HS

Category:

Behavioral and Social Sciences

Short□term memory often declines with age, though the degree of decline varies substantially across individuals. This study sought to uncover whether older adults' self□assessed quality of life can explain differences in memory test performance. Forty adults aged 50–79 (M = 63.83, SD = 10.45) completed the Washington Chudler short□term memory task and the RAND SF□36 QoL survey. The sample was demographically diverse, with the largest ethnic groups being Azerbaijani, Russian, Ukrainian, and Jewish. Because most subgroups were small, demographic comparisons were used descriptively only. Memory performance showed substantial variability across participants but followed a clear pattern across trials: accuracy declined steadily as task difficulty increased. The overall QoL composite mean was 72.17%, with domain averages ranging from 55.75% (Health Change) to 82.65% (Social Functioning). Males and females showed similar QoL and memory scores. A two□way ANOVA revealed no significant relationship between QoL and memory performance (all $p > .05$), and effect sizes were very small (Cohen's $d < .20$). Linear regression showed no significant association between age and QoL, $F(1, 38) = 0.28$, $p = .60$, and age did not predict memory performance. None of the nine SF□36 domains significantly predicted recall. Overall, these findings suggest that short□term memory performance in older adults is influenced primarily by task difficulty rather than age, quality of life, or demographic factors. These findings highlight the importance of cognitive load when assessing memory function in aging populations.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3047

A Novel Approach To Programming Suggested Dietary Alterations For Optimal Mental Health: Year II

Cera Easterwood

Conroe ISD /AST: Academy of Science and Technology

Category:

Behavioral and Social Sciences

In the past decade, mental health awareness and research have greatly increased, but many struggle with limitations regarding the treatment options. This project was motivated by a passion to enhance the lives of those suffering or prone to certain mental health conditions through a virtually free application one could access from home. After evaluating the current solutions including therapy options, medications, and peer-help groups, the researcher observed that these were costly and possibly uncomfortable for some. In considering alternative solutions, identifying a factor that could be altered in any individual was the priority. Due to their adaptability, dietary alterations emerged as a promising area of study. Further background research revealed a term, gut-brain axis, which demonstrated that the bacteria in foods can alter hormone releases and create mood changes through grey matter development. Upon coding the initial application to suggest balanced diets to patients, the new goal was to determine if the application could more effectively mitigate mental health conditions through personalized features like dietary restrictions and catered caloric levels. The application code was altered, and, from there, to preserve ethical guidelines, a public simulation of the human brain was used to monitor possible effects of this application. Sample patient profiles and diets were randomized through code to be tested in the simulation. The results supported this application as a viable option to prevent genetic conditions including Schizophrenia and Alzheimer's and dramatically reduce Anxiety and Depression symptoms. After testing 536 patient profiles of different weights, ages, and genders, 204 profiles were reported as having one of the four conditions above. Of those 204, 57.84% of the cases were undetectable after the alterations, a percentage high enough to be considered statistically and medically viable following the z-test.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[X] yes [ ] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3048

Category:

Behavioral and Social Sciences

AutiKine: Early Autism Spectrum Disorder Detection Through Video-Derived Skeletal Motor Signatures and Kinematic Body Movement Dynamics Analysis

Aathmika Rathnakumar

Conroe ISD /AST: Academy of Science and Technology

Autism Spectrum Disorder (ASD) affects 1 in 31 children in the United States, yet access to timely diagnosis remains deeply unequal worldwide. Barriers such as financial instability and limited access to specialists delay diagnosis for years, costing children critical developmental time. AutiKine is a low-cost, scalable approach to autism risk detection using video-derived movement data. The study aimed to determine whether skeletal motor patterns extracted from standard video footage could reveal measurable differences between children with ASD and neurotypical controls. Videos were analyzed to extract 2D skeletal joint coordinates from 105 children (80 ASD, 25 control) performing natural body movements. Because the analysis relies exclusively on movement patterns rather than facial features or speech, this approach reduces bias related to language, gender, and age. From the skeletal data, four motor features were recorded: joint velocity, movement amplitude, motor variability, and bilateral symmetry. These variables were selected based on prior evidence linking motor function differences to ASD and were calculated using frame-to-frame joint displacement and statistical variability over time. The Mann-Whitney U test revealed statistically significant differences between the ASD and control groups for joint velocity, motor variability, and bilateral symmetry ($p < 0.05$), while movement amplitude did not reach significance. These results demonstrate that subtle motor signatures present in everyday movement can reflect underlying neurodevelopmental differences associated with ASD. AutiKine highlights the potential of non-invasive video analysis as an equitable, diagnosis-supporting tool for autism, offering a pathway toward earlier screening without reliance on costly technology or specialized clinical resources.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3049

Gender Differences in how Sports Protect From Social Media Effects

Alexia Stout

Clear Creek ISD /Clear Lake High School

Category:

Behavioral and Social Sciences

As social media usage continues to increase across the globe, with 3.8 billion users in 2020, there is a growing decline in mental health, which can be linked back to social media. Analyzing the 2023 Youth Risk Behavior Surveillance Survey data, this experiment found that participation in sports is beneficial to high schoolers to combat the negative effects of social media on mental health. Only those that used social media were included in the data, which was cleaned and divided into male and female. Using countif statements, the experiment revealed the percentages of observations that responded that their mental health was most of the time or always not good when using social media, which was lower than those that reported that their mental health was good. In a separate countif statement, the relationship between mental health and participation on one sports team was tested. In both male and females, the number of those not participating on a sports team and reporting having not good mental health was much higher than those participating in sports. A regression was conducted, confirming prior observations, and revealing that both males and females participating on sports teams that use social media are less likely to report that their mental health is not good and confirming statistical significance. T-test was calculated yet showed no significant results between male and female mental health improvement. Participation on sports teams can help to mitigate the negative effects of social media, and plays a vital role in improving mental health.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3050

Feedback Loop: The Effect of AI and Social Norms on Performance

Katherine Wu

Katy ISD/Seven Lakes - HS

Category:

Behavioral and Social Sciences

Artificial intelligence is used in many settings to deliver feedback, which raises questions about whether the source or the content drives motivation. This study examines how feedback attribution and social norm information shape performance. Randomized experiments show that peer performance information increases effort across all settings, regardless of whether feedback is attributed to AI or a human. The source alone produces little difference. Social norms reveal important patterns. Negative comparisons produce stronger effort gains than positive ones. AI delivered negative feedback produces a larger response than AI delivered positive feedback. Human delivered feedback shows similar effects for both types of feedback when paired with social norms. The results show that relative performance information drives behavior far more than the identity of the messenger. Social norms play a central role in shaping effort.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3051

Thinking Together: Measuring Cognitive Effienceny Across Group Sizes

Sanjana Ambalavanan

Conroe ISD /AST: Academy of Science and Technology

Category:

Behavioral and Social Sciences

The purpose of this project is to identify any significant correlation between group size, gender, and cognitive performance. To find this relationship, 30 human participants were given a test to take in multiple different group sizes. These participants took the test individually first, then in groups of 5, 10, 15, 20, 25, and 30. Test scores were recorded and mean scores for each group size and gender were calculated. A two-way ANOVA was used to determine whether group size and gender significantly affected cognitive performance. The analysis revealed a significant relationship between group size and cognitive performance; however, gender did not have a significant effect. To validate these findings, two one-way ANOVA tests were conducted. The results of this analysis verified the original findings with a 99% confidence level. Based on these results, it was concluded that group size had significantly influenced the cognitive performance of an individual; however, gender did not significantly influence on cognitive performance in groups.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3052

A Cognitive-Mechanism-Based Prototype for Optimizing Digital Learning in Gen Alpha Amid Digital Distraction

Serena Ukor

Houston ISD/DEBAKEY HIGH SCHOOL FOR HEALTH PROFESSIONS - HS

Category:

Behavioral and Social Sciences

Digital technology is central to modern education, but constant exposure to notifications and multitasking environments may interfere with students' ability to learn effectively. Generation Alpha students, who have grown up with continuous access to digital devices, may be particularly vulnerable to digital distraction during academic tasks. This study will investigate how digital distraction influences domain-specific cognitive performance — attention, memory, and processing speed — and determine which cognitive domains best predict learning outcomes in Gen Alpha learners. Approximately 40 students aged 13–15 will complete online cognitive tasks under two conditions: a no-distraction condition and a digital-distraction condition. Attention will be measured using a Stroop task, memory using a digit-span recall test, and processing speed using a reaction-time test. Participants will read a standardized passage adapted from a state-level English assessment and complete a researcher-designed quiz assessing five comprehension domains. Two equivalent question sets will be administered across conditions. All tasks will be conducted anonymously online, and condition order will be counterbalanced to reduce order effects. Paired statistical comparisons will assess the impact of digital distraction on cognitive performance, and a multiple regression model will predict learning outcomes based on attention, memory, and processing-speed scores while controlling for age and sleep. These predictive findings will guide development of an adaptive educational app designed to tailor learning activities to students' cognitive strengths and vulnerabilities, optimizing engagement and academic performance. The study is expected to show that digital distraction primarily impairs attention, which predicts lower learning outcomes, providing evidence-based guidance for personalized, distraction-aware educational tools.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3053

The Effect of Artificial Intelligence on Learning and Confidence as a Support in Reading

Osvaldo Lopez, Jefferson Lopez

Aldine ISD/Blanson CTE HS

Category:

Behavioral and Social Sciences

Title: The Effect of Artificial Intelligence on Learning and Confidence as a Support in Reading Problem: How does using artificial intelligence as a support during reading affect students' learning outcomes and their confidence in understanding the material? Hypothesis: Students who use artificial intelligence as a support while reading will have higher learning outcomes and greater confidence compared to students who read without AI support Variables: Independent Variable : Use of artificial intelligence as support in reading Dependent Variables: Learning outcomes (quiz scores after reading) Student confidence (self-reported confidence rating after reading) Controlled Variables (what you keep the same): Same reading material for all groups Same time allocated for reading Same quiz for assessment Same environment for reading sessions Procedure: Levels: Reading with AI support Reading with AI + normal reading Reading without AI 2. Group Assignment: Divide the students into three groups using random assignment: Group 1: Reading passage with AI support Group 2: Reading only the passage Group C: Only AI support

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3054

Standardizing Deselection for High School Coaches and Athletes

Lara Malkani

Friendswood ISD /Friendswood High School

Category:

Behavioral and Social Sciences

Deselection can be a challenging process for coaches and athletes alike, especially due to the emotional vulnerability at the high school level. This project hypothesized that a standardized process of deselection would minimize the emotional burden caused by these tryout processes. Data collected through two rounds of surveys sent to both coaches and athletes who have had experience with a deselection process suggest that deselection is often inconsistent; while 77.8% of athletes indicate that there is a rubric used during the tryout process, only 31.6% of these athletes are able to see their rubric or final score following the tryout. Additionally, the role of social media plays an important part in athlete impact. 80% of athletes indicated they preferred their results were not shared on social media, despite 52% of athletes experiencing social media usage within their tryout. Athlete perception reveals that 46.7% of participants had an emotionally challenging experience with deselection. This number jumps to 100% when looking at the cross-tab of deselected athletes. In designing the proposed deselection process, factors such as communication method, timing, and social media posting were all taken into account. For all elements of the process, 60% or greater of the respondents perceived that the attributes of the proposed process were positive. Additionally, 73.3% of surveyed participants believe that the proposed deselection process is easier emotionally, supporting the hypothesis that a standardized process of deselection lessens the emotional impact for all those involved.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3055

A Machine Learning Framework for Improved Phenotypic-Specific Autism Diagnosis

Jefferson Le, Jayden Lin, Hemish Duri

Cypress Fairbanks ISD/Bridgeland - HS

Category:

Behavioral and Social Sciences

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that affects over 60 million people globally. Standard diagnostic approaches for ASD struggle with certain demographics due to social camouflaging and other confounding factors, leading to misdiagnosis and delayed intervention. Current machine learning (ML) models have shown reduced diagnostic performance for teenagers, females, and high IQ individuals. Previous research has attempted to reduce sex-based disparities in diagnostic accuracy but often fails to account for other phenotypic variables. This study aims to improve diagnostic accuracy for ASD in teenagers, females, and high IQ individuals through phenotypic-specific ML classifiers. This study utilized a dataset of 2,226 subjects by combining the ABIDE I and ABIDE II public datasets. Subjects were stratified into six comparative phenotypes based on age, sex, and IQ, including intersectional subgroups (e.g. high IQ females). Using a Random Forest ML Algorithm, diagnostic bias was confirmed through significant drops in accuracy of up to 20% in the six opposing phenotypic groups. After extracting feature importance scores from the models, six new ML algorithms were constructed and trained on the top ten most predictive features for each group, resulting in increases in accuracy of up to 11%. These findings highlight the potential of integrating phenotypic-specific ML models into screening pipelines. This research demonstrates a framework for faster and more accurate diagnosis of ASD, while identifying areas for improvement in current diagnostic approaches for varying phenotypic groups.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3056

The effect of phone screen exposure on C.elegans behavior

Category:

Behavioral and Social Sciences

Zubida Alokozay, Marim Alokozay

Harmony Public Schools - South District/Harmony Science Academy-Houston

Smartphone use is widespread among students, and prolonged screen exposure may affect nervous-system function. This project used the nematode Caenorhabditis elegans to test whether a long smartphone video alters locomotion and whether natural products can reduce these effects. Worms were fed twice on treated plates (two 24-hour feedings). Saffron (Crocus sativus) aqueous extract was tested at low, medium, and high doses, with water as the control. After the second feeding, worms were exposed to a smartphone playing a 1 hour 9 minute video, and locomotion was evaluated in 3–4 plate sectors (technical replicates) before and after exposure using observable metrics (speed, coordination, clumping/collisions, coiling/head twitching, and immobility). Before exposure, saffron-treated worms generally showed normal, healthy movement. After exposure, water controls showed the strongest behavioral disruption, including increased clumping, collisions, slowed movement, waggling without forward travel, and more immobile ("stuck") worms. Many saffron sectors maintained more regular movement than exposed water controls, although some low/medium-dose sectors still showed abnormal behaviors. Overall, the observations suggest saffron may reduce some smartphone-associated locomotion abnormalities, but effects were variable across sectors. AstaReal® L10 (astaxanthin) testing will follow using the same design; results are pending.

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 [X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3057

The Effect of Peer Information and Perceived Observation on Factual Decision-Making Accuracy in Adolescents

Sarah Tran, Vihaan Jain

Cy-Fair ISD/Cypress Ranch - HS

Category:

Behavioral and Social Sciences

When making decisions in group settings, adolescents are particularly vulnerable to peer influence. This study investigated how classmate response information and perceived observation affect adolescents' conformity when answering factual questions with objectively correct answers. Forty participants aged 13–16 were randomly assigned to one of three conditions: 1. A control condition with no peer information; 2. A condition in which (false) simulated peer-majority responses were shown; and 3. A condition in which simulated false peer-majority responses were shown, and participants were informed that their responses could be viewed by other students (perceived observation). Participants completed a single session of trivial, difficult factual multiple-choice questions, and conformity was measured as the number of times participants selected an incorrect answer that matched the incorrect peer-majority response. Mean conformity scores increased across conditions, with a mean of 0 in the control condition, 6.85 in the peer-cue condition, and 13.08 in the peer-cue with (perceived) observation condition. A one-way ANOVA revealed a statistically significant difference in conformity across the three conditions ($F = 145.78$, $p < 0.001$). These results help reveal that exposure to peer information increases conformity and that perceived observation further amplifies this effect beyond the influence of peer information alone. This study demonstrates that social influence can affect adolescents' accuracy even on factual tasks with correct answers. The findings of our study contribute to a better understanding of how informational and normative social influences affect teenagers and have implications for educational and online environments where adolescents frequently make decisions in the presence of others.

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

[X] 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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no

Abstract: Science and Engineering Fair of Houston

3058

The Impact of Gifted and Talented (GT) Students on Overall Academic Performance in Texas Elementary Classrooms

Izma Aziz

Clear Creek ISD /Clear Brook High School

Category:

Behavioral and Social Sciences

Gifted and Talented student programs are common in elementary schools in the United States, with much uncertainty surrounding their effectiveness and whether or not having gifted identified students in the classroom has an effect on the academics of the other students in the classroom. Research suggests that the presence of high-achieving students does influence the academic performance of their classmates. In this experiment, one hundred elementary schools across Texas were randomly selected, and data was gathered from the Texas Education Agency (TEA). For each school, the total enrollment and the number of Gifted and Talented (GT) students, as well as their STAAR proficiency rates for Math, ELA, and Science, were collected. After testing for a positive correlation between GT% and test scores, the number of economically disadvantaged students was also collected and considered using a regression test. The data from the experiment seems to suggest that the overall academic performance at an elementary school is affected by having a higher percentage of gifted and talented students in classrooms. The initial results showed that there was no positive correlation between GT percentage and overall academic performance. However, once data of economically disadvantaged students was accounted for, it was proven that even if two schools have similarly disadvantaged populations, the one with a higher ratio of GT students is likely to have a higher level of academic performance. This experiment is important because it helps us understand that a student's academic performance is influenced by various factors and that while in isolated studies it may be found that GT students can have a positive impact in classrooms, those other factors play a dominant role in determining academic success.

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.

[X] yes [ ] no

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

[ ] yes [X] no

4. This project is a continuation of previous research.

[ ] yes [X] no

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

[ ] yes [X] no

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

[X] yes [ ] no